UNIVERSIDADE DE SÃO PAULO
ESCOLA POLITÉCNICA

PRYSCILLA APARECIDA VAZ DE OLIVEIRA

Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices

São Paulo
2023

PRYSCILLA APARECIDA VAZ DE OLIVEIRA

Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices

Original Version

PhD Thesis presented to the Graduate Program in Production Engineering at the Polytechnic School, University of São Paulo, Brazil, to obtain the Doctor in Science degree.
Supervisor: Prof. Dr Mario Sergio Salerno

São Paulo

2023

Catalogação-na-publicação

Oliveira, Pryscilla Aparecida Vaz de
Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices / P. A. V. Oliveira -- São Paulo, 2023.
384 p.

Tese (Doutorado) - Escola Politécnica da Universidade de São Paulo. Departamento de Engenharia de Produção.

1.Inovação estratégica 2.Administração de recursos humanos 3.Gestão de talentos 4.Administração executiva 5.Avaliação de recursos humanos e feedback I.Universidade de São Paulo. Escola Politécnica. Departamento de Engenharia de Produção II.t.

Nome: OLIVEIRA, Pryscilla Aparecida Vaz

Título: Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices

Tese apresentada à Escola Politécnica da Universidade de São Paulo para obtenção do título de Doutora em Ciências.

Aprovado em:

Banca Examinadora

Prof. Dr. _____
Instituição: _____
Julgamento: _____

Prof(a). Dr(a). _____
Instituição: _____
Julgamento: _____

Prof(a). Dr(a) _____
Instituição: _____
Julgamento _____

Prof(a). Dr(a). _____
Instituição: _____
Julgamento: _____

Prof(a). Dr(a) _____
Instituição: _____
Julgamento: _____

DEDICATÓRIA

Para Catarina, que me acompanhou no desenvolvimento dessa tese desde a gestação.

Para as mulheres que caminharam ao meu lado e me ensinaram o valor e a fibra necessárias para resistir e seguir em frente, Rosa, Mabilde, Deolinda, Dina, Danielle e Marianas.

AGRADECIMENTOS

Agradeço ao Professor Dr. Mario Sergio Salerno por sua orientação e disponibilidade no desenvolvimento da tese.

À Universidade de São Paulo, Escola Politécnica e Departamento de Engenharia de Produção pelo acolhimento e oportunidade de orgulhosamente fazer parte de sua comunidade científica. Um especial agradecimento aos professores e funcionários que me guiaram nesse processo.

À Universidade Federal do ABC por despertar em mim o amor pela academia e ter me proporcionado uma base sólida para enxergar e chegar mais longe.

À CAPES, CNPq e FAPESP, instituições pelas quais o povo brasileiro e paulista financiou direta e indiretamente esta pesquisa científica. Também agradeço ao Programa de Estudos em Gestão de Pessoas da Faculdade de Administração e Economia pelo acesso à base de dados das Melhores Empresas para Trabalhar utilizada nesta pesquisa.

Às empresas, colaboradores e consultores que gentilmente cederam o seu tempo e apoio ao desenvolvimento desta pesquisa. Essa tese só foi possível pela sua disponibilidade e generosidade.

Aos colegas do Laboratório de Gestão da Inovação Vinicius Brasil, Lidyane Barros, Rafael de Paula, Simone Lara, Felipe Maranzato, Ana Paula Paes Leme, Ana Facin, Fred Vasconcelos, Tiago Lasmar, Gabriela Lhamas, Laura Rafael, Camila Conegundes, Cristiane Matsumoto, Leonardo Vasconcelos, Felipe Maruayma, Julio Mello, João Vitor, Achiles Soares, Lethicia Vivas, Marina Reis, Marcio Campos, Jaime Frenkel, Rafael Marciano, Edvan Ferreira, Otávio Vianna e Ronaldo Moura, assim como à Giuliana Florez e Christian Cubillos, Marcela Zucherato e Emilia Melo, pela colaboração, amizade e convívio ao longo desses anos.

À minha rede de apoio Natália Vaz, Mariana Paes, Nathalia Martins, Ana Claudia Mendes, Thais Felicio, Natércia Grilo, Mariana Camargo, Isabelle Tobias, Victoria Araújo, Marcela, Stela e Sandra por toda força e amparo que me proporcionaram em meio às turbulências.

Às famílias Vaz e Oliveira Braga pelo amor, carinho e por nunca me perguntarem se esse doutorado não acabaria nunca.

À Mariana Tambellini, por compartilhar comigo essa jornada com sua infinita amizade, encorajamento, luz e presença na minha vida desde 2006.

Ao meu pai Rubens e à minha madrinha Mabilde que fazem uma falta danada.

Aos meus irmãos, Danielle, Rubens Felipe e Rodrigo Davy, e aos meus amados sobrinhos Felipe, Ana Clara e Lucas. A vida é mais bonita e divertida por vocês fazerem parte dela.

À minha mãe Rosa, meu porto seguro, meu exemplo. Se escrevo hoje essas palavras é porque você esteve ao meu lado, me ensinando o valor da resiliência e da alegria.

À minha filha Catarina por esse amor incondicional que só uma criança consegue transmitir. Por ter me alegrado e acarinhado. Por seus sorrisos e risadinhas. Por me permitir te ver crescer, se desenvolver e se tornar uma menina cada dia mais incrível.

À Jesus e Maria pela força, resiliência, todos os pequenos milagres e por ensinar que a maior lei amar.

EPÍGRAFE

“Este livro
foi escrito por uma mulher
que fez a escalada da Montanha da Vida
removendo pedras
e plantando flores.”
- Cora Coralina

RESUMO

OLIVEIRA, P. A. V. **Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices**. 2023. Tese (Doutorado) – Escola Politécnica da Universidade de São Paulo. Programa de Pós-Graduação em Engenharia de Produção. São Paulo, 2023.

A inovação estratégica envolve projetos de longo prazo com grandes incertezas que podem alavancar a performance de empresas estabelecidas. A capacidade de inovar de uma organização está intrinsecamente relacionada com a competência e motivação das pessoas. Cargos de inovação estratégica têm mostrado uma falta de potencial de crescimento, enquanto empresas apresentam dificuldade na retenção desses funcionários, que possuem habilidades escassas no mercado de trabalho e detém parte importante do capital intelectual da organização. O objetivo desta pesquisa é verificar os aspectos da gestão de recursos humanos (RH) relacionados à gestão estratégica da inovação, identificar as práticas de RH que impactam o trabalho dos funcionários de inovação estratégica e a presença de cargos estratégicos relacionados à inovação na alta liderança executiva da empresa a fim de analisar abordagens eficazes de RH que possam motivar e reter talentos inovação estratégica. Por este ser um assunto pouco abordado na literatura, optou-se pela metodologia de pesquisa de construção de teoria a partir de estudos de caso, uma abordagem comparativa e iterativa em que foram integrados dados qualitativos de quatro estudos de caso e dados quantitativos que analisaram as práticas de gestão de talentos utilizando o banco de dados do ranking brasileiro das *Melhores empresas para trabalhar* e a carreira dos CEOs de empresas listadas como as mais inovadoras do mundo e do Brasil entre 2016 e 2020. Os resultados mostraram que os aspectos de RH relacionados à gestão estratégica da inovação são: papel da gestão executiva, estrutura organizacional, papéis de inovação estratégica, gestão de talentos, práticas de avaliação, desenvolvimento e recompensas; a investigação sobre gestão de talentos para inovação apontou o uso de práticas de avaliação, desenvolvimento e recompensas em empresas inovadoras; e a análise dos CEOs mostraram que cerca de 15% deles tinham experiência em inovação nas empresas mais inovadoras. A análise qualitativa destacou problemas de retenção de funcionários de inovação estratégica baseados na falta de oportunidades de desenvolvimento de carreira e reestruturações organizacionais, enquanto metas de avaliação renegociáveis relacionadas às atividades de inovação estratégica, metas para equipe, avaliação de competências com foco inovação, garantia de manutenção do emprego em caso de incertezas e oportunidades de carreira estimulantes podem reduzir a sensação de risco de carreira. O envolvimento do CEO e gestão executiva da empresa pode fomentar o desenvolvimento e a estrutura de inovação estratégica, além de demandar o suporte formal do RH e reconhecimento dos funcionários da área. A construção de uma capacidade de inovação estratégica duradoura em organizações estabelecidas abrange o cultivo e o desenvolvimento de talentos estratégicos de inovação.

Palavras-chave: Inovação estratégica. Administração de recursos humanos. Gestão de talentos. Administração executiva. Avaliação de recursos humanos e feedback.

ABSTRACT

OLIVEIRA, P. A. V. **Nurturing Strategic Innovation Talent in Established Organizations: The Role of Human Resource Management Practices.** 2023. Thesis (Doctorate in Science) – Polytechnic School of the University of São Paulo. Graduate Program in Production Engineering. São Paulo, 2023.

Strategic innovation involves long-term and highly uncertain initiatives to achieve significant performance gains. An organization's innovation capacity is intrinsically related to the employees' capabilities and motivation. Still, strategic innovation positions have shown a lack of growth potential, and retaining strategic innovation employees has been challenging established companies with a high turnover of a scarce workforce that holds an important part of the company's intellectual capital. This research aims to verify human resource management (HRM) aspects related to strategic innovation management, identify HRM practices that impact the employees' work activities, examine the presence of strategic innovation-related positions at top management teams (TMT), analyze effective HRM approaches to motivate and retain strategic innovation talent and support strategic innovation management. The research design was based on Eisenhardt's methodology, "building theory from case studies", an iterative comparative approach, as it is an under-addressed subject in the literature. Qualitative data from four cases and quantitative data that analyzed the HRM practices related to talent management 2017's Brazilian Great Place to Work database and the career of the CEOs of companies listed as the most innovative in the world and Brazil from 2016 to 2020 were integrated to address the subject in greater depth. Results showed that HRM topics related to strategic innovation management are: TMT involvement, structure, roles and positions, talent management, evaluation, development, and rewards practices; the investigation on talent management for innovation appointed the use of assessment, development, and rewards practices in innovative companies; and the CEO analyzes showed about 15% of them were experienced in innovation in the most innovative companies. The qualitative investigation highlighted strategic innovation retaining problems based on a lack career opportunities and organizational restructures, while renegotiable goals related to strategic innovation activities, team-based evaluation, subjective evaluation focusing on innovation-related competencies, job security guarantee in the event of uncertainties, and stimulating career opportunities may reduce career risk perception. In addition, the involvement of the CEO and the TMT can nurture strategic innovation development, strategy, structure, and employee recognition and demand the HRM's formal support for strategic innovation employees. Ultimately, building a lasting organizational capability for strategic innovation in established organizations encompasses cultivating strategic innovation talent.

Keywords: Strategic innovation. Human resource management. Talent management. Top management team. Human resource evaluation and feedback.

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

BCG – Boston Consulting Group

BP – Business Partner

EBITDA – Earnings before interest, taxes, depreciation, and amortization

ESG – Environmental, social, and governance

EV – Enterprise Value

EVA – Economic Value Added

FDA – American Food and Drug Administration

FEA – Faculdade de Administração, Economia e Contabilidade da USP

FIA – Fundação Instituto de Administração

GPTW – Great Place to Work

HR – Human Resource

HRBP – Human Resource Business Partner

HRM – Human Resource Management

IHW – Index of Happiness at Work

LGI – Laboratório de Gestão da Inovação da USP

NVP – Net Present Value

Poli – Escola Politécnica da USP

PMO – Project Management Office

PROGEP – Programa de Estudos em Gestão de Pessoas

R&T – Research & Technology

TRL – Technology Readiness Level

USP – Universidade de São Paulo

VP – Vice-president

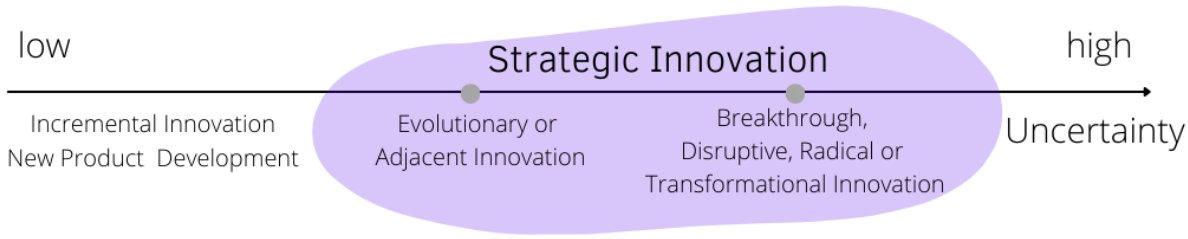
VUCA – Volatile, Uncertain, Complex, Ambiguous

SUMMARY

1. INTRODUCTION

Innovation is related to the maintenance of competitive advantage, performance (Seeck & Diehl, 2017), and the creation of economic value for companies (Pisano, 2015). Strategic innovation, long-term and very uncertain endeavors that surpass the incremental (O'Connor et al., 2018), is associated with the leap in performance, the organization's leadership, and the core of long-term wealth creation (Marvel et al., 2007). Strategic innovation is defined as innovations deliberately developed by the organization aimed at generating new business opportunities within the company and the market in order to achieve entirely novel breakthroughs. The authors view innovation as a spectrum that encompasses varying levels of uncertainty, as shown in Figure 1. The organizations' current volatile, uncertain, complex, and ambiguous (VUCA) context demands unexpected adaptations and changes that compel them to pursue strategic innovation (Oltra et al., 2022), striving for market disruption (O'Connor et al., 2018).

Figure 1: Types of innovation along the uncertainty spectrum.



Source: adapted from O'Connor et al. (2018).

The definition of what is considered a strategic innovation in this thesis and the description of each type of innovation presented in Figure 1 will be further developed in Section 3.2.

Innovation is usually the outcome of new knowledge creation, which is driven by individuals (Kong et al., 2013), whose capabilities, motivation, and commitment firms are dependent on to develop strategic innovation (Kelley et al., 2011; Salerno & Gomes, 2018; Seeck & Diehl, 2017). As knowledge is created and stored within individuals (Aagaard & Andersen, 2014), organizations must manage their human

capital effectively (Kong et al., 2013) since it is considered the most critical factor in enhancing innovative capacity (Aagaard & Andersen, 2014; O'Connor et al., 2018).

The company's personnel work activities are a human resource management (HRM) subject, which focuses on the achievement of long-term competitive advantage and business goals through the development of highly committed, capable employees and organizational culture, structure, and values (Storey et al., 2019). It involves how the work is organized and includes the organization's structure; employment and management policies and practices through motivation, hiring, appraisal, development, and retaining activities; and informing, consulting, and negotiating processes between the company and its workforce (Boxall & Purcell, 2011). The HRM's definitions do not mention contextual issues, such as technological innovations, market conditions, regulations, labor market, and social changes. Furthermore, many critics argue that, besides securing a competitive advantage, the HRM's objective should include corporate collaboration, the workforce's well-being, equity, and multiple stakeholder interests that could be part of the organization's strategy (Storey et al., 2019). Innovation researchers have shown more interest in HRM than the opposite, and the efforts to identify and describe the nature of the relationship between the two areas are relatively recent and scarce (Aagaard & Andersen, 2014).

The management of strategic innovation and HRM are both, by definition, closely linked to the company's strategic objectives. The issue of retaining strategic innovation employees is prevalent in literature and empirical data, given that the development of strategic innovation is absolutely dependent on the workers who perform their various roles. There is, therefore, an evident misalignment in this dialogue, which can be intensified by the contextual changes that have taken place in recent years, especially from 2020 onwards.

The VUCA concept resurfaced in 2020 when the COVID-19 pandemic impacted the whole world, and in what concerns this research, established companies, their workers, and how they relate. Since 2020, work principles and paradigms have changed, companies have grown digitally, the home office has been popularized, and hybrid work has emerged as an alternative between the pre-pandemic and lockdown work formats. Individuals, on the other hand, while rethinking work-life balance and mental health, have provoked two phenomena: the Great Resignation, millions of people left their jobs without having another offer triggered, which occurred mainly in

the United States; and Quiet Quitting, characterized by the commitment of employees strictly within what is specified in the job description, avoiding to go beyond the assigned duties, working overtime, or attending non-mandatory meetings (Formica & Sfodera, 2022; Klotz & Bolino, 2022).

The 2022 Work Trend Index indicates that flexibility and well-being became non-negotiable work aspects for employees worldwide, especially in Brazil, and most of the younger workers affirmed that they consider developing side projects or businesses as an alternative income within a year (Microsoft, 2022). HRM practices are tools to motivate employees to perform according to the organization's desired work behavior to achieve its objectives (Andreeva et al., 2017; Katou & Budhwar, 2010). Therefore, companies need to be aware of what motivates their employees, listen to their needs when designing and reshaping attraction and retention systems for strategic talents engagement within the firm (Klotz & Bolino, 2022; Microsoft, 2022), and be more precise on what is expected of employees (Klotz & Bolino, 2022). Moreover, if retaining knowledgeable, highly skilled, experienced employees was difficult for innovative firms, as they did not have difficulties changing jobs (Marvel et al., 2007) before the recent changes, this innovation talent retention may have become more critical as of 2020.

Human resource (HR) practices have a strong positive effect on the organization's performance when aligned with the firm's strategic intent (Andreeva et al., 2017; Beugelsdijk, 2008). Nevertheless, HRM was shallowly addressed by strategic innovation management researchers for decades, in spite of being human capital its primary resource. The first paper identified to delve deeper into this topic was "The human side of radical innovation" (O'Connor & McDermott, 2004), an outcome of the recognized O'Connor's research group longitudinal qualitative work of with strategic innovation in large companies, initiated in 1995, which have recently dedicated their latest book "Beyond the champion: institutionalizing innovation through people" to it (O'Connor et al., 2018). Nevertheless, the literature on strategic innovation management and HRM did not reach 30 papers, by the end of 2022. Despite the importance of the subject, scholars have given little attention to HRM policies on the activities of innovation management, rarely acknowledging the distinction between strategic and incremental innovation, an issue of utmost importance for organizations to gather and stimulate the best talents to engage in this career (Seeck & Diehl, 2017).

Many HR-related problems have been identified in established companies that systematically develop strategic innovation: (1) strategic roles, positions and responsibilities were not clarified or institutionalized; (2) there was no talent management and retention tools for strategic innovation employees; (3) strategic innovation project's assignments were temporary and borrowed part-time from other areas, where individuals frequently had to deal with urgent issues (O'Connor et al., 2018; O'Connor & McDermott, 2004); (4) strategic innovation employees were annually assessed based on objective metrics, while involved in uncertain contexts where most of the projects might fail anytime, be canceled or take years to maturate; (5) and were not compensated, incentivized or rewarded for the undertaken strategic innovation projects' inherent risks, that may increase risk aversion and discourage cooperation, which is fundamental for strategic innovation (O'Connor et al., 2018; O'Connor & McDermott, 2004; Salerno & Gomes, 2018); (6) there was a high rate of frustration, quitting and demission among strategic innovation employees, causing a career risk perception (O'Connor & McDermott, 2004).

HRM practices assist in the delivery of strategic objectives, but different strategies require distinct employee capabilities (Storey et al., 2019). Individuals who work with strategic innovation in established companies, with defined structure and processes, face challenges that may not be quantifiable and are not common to other areas of the organization, such as reducing uncertainties, seeking for or creating opportunities for future scenarios, negotiating partnerships with other firms, research centers or governments, in which there are no guarantees of success (O'Connor et al., 2018; O'Connor & McDermott, 2004; Salerno & Gomes, 2018). However, the processes aimed at managing people are usually the same for everyone (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022; Salerno & Gomes, 2018), and issues like establishing metrics for evaluation, the recognition of significant achievements, the long duration of projects, and the human capital's retention, motivation and engagement in the company have become major obstacles to strategic innovation (Aagaard & Andersen, 2014; Andreeva et al., 2017; Hebda et al., 2012; Koberg et al., 1996; O'Connor et al., 2018; O'Connor & McDermott, 2004; Salerno & Gomes, 2018; Urban & Verachia, 2019). In other words, employees with short-term activities can easily be evaluated, rewarded, and developed, but the same is not valid for strategic innovation workers (Salerno & Gomes, 2018).

Strategic innovation becomes increasingly expensive as projects evolve, and there are no guarantees that uncertainties will be resolved, the opportunity will be launched, and achieve the expected success (O'Connor et al., 2018; Salerno & Gomes, 2018). The strategic innovation literature brings several examples of people being punished for failures in projects (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004), but the loss of innovation talents may impact the firm's human capital, as the employees' knowledge, network and expertise that were in the company, where they may have been developed, are lost for competitors, or the development of new entrants, when the former employees use their expertise to start their own business in the same market as the previous company (Kong et al., 2013; O'Connor et al., 2018).

Strategic innovation development needs leadership that is prepared and experienced in innovation to understand the challenges imposed by high levels of uncertainty and long-term projects (O'Connor et al., 2018), being able to balance it with incremental innovation needs (Lazzarotti & Manzini, 2018). Leaders may overcome these complexities by monitoring all the innovation stages and utilizing their range of influence to be able to establish the innovation focus of the strategic intent and guarantee the resource allocation to obtain the recompenses that strategic innovation can offer for the company (Cortes & Herrmann, 2021; O'Connor et al., 2018).

The specific and complex role of the strategic innovation leadership may cause a problem in composing the company's top management team (TMT) with people familiar with this type of innovation (Cummings & Knott, 2018; Daellenbach et al., 1999). Daellenbach et al. (1999) define the top management team as the two highest levels of a company's hierarchy, that is, the C-level executives, including the CEO.

The existence of knowledgeable representatives in strategic innovation at the TMT also helps retain innovation talent and, the maintenance of the company's innovative capacity. The frequent contact of the strategic innovation employees with the TMT promotes visibility and development opportunities for those who outstand within the strategic innovation function (Fowinkel, 2014; Kelley et al., 2011).

This research thesis aims to verify how established companies that strategically pursue innovation are structured and handle HRM-related issues within the strategic innovation function to mitigate their inconsistencies with the traditional HRM systems: understanding the strategic innovation function in terms of roles; investigating the

presence of members representing the areas of innovation and technology in strategic positions of the company; identifying the assessment and reward practices focused on strategic innovation employees in the studied companies; and analyzing whether the detected practices are aligned with the strategic innovation characteristics and challenges.

Most papers that address HRM and strategic innovation management are qualitative researches, mainly characterizing the inconsistencies between traditional HRM practices and strategic innovation management attributes, its possible consequences, some possibilities to facilitate strategic innovation management issues, and what motivates strategic innovation employees (Aagaard, 2017; Bruneel et al., 2012; Fowinkel, 2014; Hebda et al., 2012; Kelley et al., 2011; Lettice & Thomond, 2008; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; O'Connor & McDermott, 2004; Oltra et al., 2022; Shaikh & O'Connor, 2020). While quantitative papers appointed that HRM is positively related to strategic innovation and assessment practices may have a positive correlation, there was no consensus about whether reward practices have a positive correlation with innovation or not (Andreeva et al., 2017; Beugelsdijk, 2008; Cavagnoli, 2011; Cho & Kim, 2017; Thneibat et al., 2022). Many papers analyzed the concomitant use of HRM practices, but no consensus has been reached since the presented combinations differ (Aagaard & Andersen, 2014; Andreeva et al., 2017; Farouk et al., 2016; Kelley et al., 2011; O'Connor et al., 2018; Zhang & Jin, 2014). Some papers highlighted the role of the TMT in strategic innovation management and development (Bruneel et al., 2012; Cho & Kim, 2017; Kanchanabha & Badir, 2021; Kelley et al., 2011; Marx et al., 2016; O'Connor et al., 2018).

Notwithstanding, there is a gap regarding a complete framework encompassing all the aspects related to strategic innovation management and HRM in established companies; analyzed whether there were people with innovation management experience in the TMT and its role in innovative companies; and which HRM practices are most used for talent management in innovative companies. Additionally, assessment and development practices for strategic innovation employees were much less explored than rewards; and there is a need to elucidate which HRM practices help and hinder the development of strategic innovation and how they can be used together to increase strategic innovation outcomes. Besides, as most of the studies were conducted in developed countries (90%), mainly the United States of America and

European Union countries, research performed in developing countries is incipient. Established innovative firms in such contexts may present differences in the problems and solutions for issues involving strategic innovation and HRM. Thus, the discussion of HRM's role in legitimizing strategic innovation through the organizational structure and innovation roles; and the HRM practices used for strategic innovation employees in developing countries needs to be deepened.

The research problem aimed to understand the HRM system and practices focused particularly on strategic innovation employees in established innovative companies. Therefore, a multiple case study design, based on Eisenhardt's "Theory building from cases", was used inductively to explore cases in a scarce theoretical background to contribute to theory building (Eisenhardt, 1989).

The thesis results showed that aligning strategic innovation management and HRM with the organization's strategy is crucial for retaining and managing strategic innovation talents, as an HRM system that prioritizes innovation strategy can significantly impact talent retention. HRM practices such as objective and subjective evaluations, collective appraisal, and job security, that is, guarantee that a dismissal caused by a project's discontinuation is unlikely, and career opportunities have the potential to reduce career uncertainties and impact talent retention. Furthermore, the TMT must acknowledge the importance of retaining strategic innovation talents and direct the innovation strategy to the HRM's assignments to establish retention indicators and develop a talent management system. These results reinforce the need for individuals experienced in strategic innovation in the TMT of innovative companies to create the organization's strategy, legitimize strategic innovation, and demand proper HRM practices for the strategic innovation function career development.

This research thesis contributes to the innovation management literature by the formulation of proposals aimed at directing future research and establishing a foundation for the advancement of theory in strategic innovation development and HRM, developing a comprehensive framework that covers HRM aimed at the strategic innovation management, identifying talent management practices closely related to innovation management, emphasizing the crucial role of the TMT in maintaining and legitimizing the strategic innovation function, and demonstrating how HRM practices can help reduce the impact of strategic innovation's uncertainties over strategic innovation employees career and turnover.

2. OBJECTIVES AND RESEARCH QUESTIONS

The purpose of the research problem is to clarify and understand the misfit evidenced by the literature between HRM and strategic innovation management practices in established companies.

Hence, the general objective of this research is to verify how established companies, which seek innovation as a competitive advantage, are structured and deal with issues related to HRM within the strategic innovation function to mitigate their inconsistencies with the traditional HRM systems in use.

The specific objectives are:

i. to understand the HRM aspects related to strategic innovation management;
ii. to identify the HRM practices that most impact the strategic innovation employees' work activities;
iii. to verify the presence of representing members from innovation and technology areas in strategic positions of the company;
iv. to understand the strategic innovation function in terms of roles, talent management, evaluation, development, and rewards; and
v. the impact of uncertainties on strategic innovation management's work.

Thus, the research questions that will guide this investigation are:

(1) Which aspects of the human resources system are most related to the strategic innovation development in established innovative companies?
(2) How are these human resource aspects are used to overcome strategic innovation challenges in an attempt to enhance innovation outcomes?

3. THEORETICAL BACKGROUND

“The human side of radical innovation” by O’Connor & McDermott (2004) was one of the first academic papers on innovation management literature to discuss strategic innovation, specifically on radical innovation, focusing on the human interface in established firms. In this paper, the authors addressed several aspects to increase the humanness of radical innovation to develop this capability in established firms related to innovation roles and HRM:

Innovation roles

(1) There was a range of specific roles needed in radical innovation projects, such as idea generator, opportunity recognizer, championing, project leading, gatekeeping, sponsoring, and project alumni;

(2) The composition of radical innovation teams differed significantly from incremental innovation teams. Radical innovation teams traditionally relied on volunteerism and informal recruitment based on personal connections and a keen aspiration to contribute to something important;

(3) The multi-dimensionality in radical innovation teams was particularly important. A team with a broad range of skills to draw upon can raise the probability of finding solutions that are not obvious;

(4) There was a need for change in the leadership of a project as it matured. Scientist skills become obsolete as the product is developed and business skills start to be required.

HRM

(1) There was a lack of coordination and connection between radical innovation roles, and their links were fragile. Hence, there was a need to nurture and use internal and external informal social networks to access leading-edge technical information and build alliances to facilitate radial innovation;

(2) There was a substantial mismatch between the risks and rewards for members of radical innovation teams.

Additionally, O'Connor & McDermott (2004) highlight a high rate of frustration across radical innovation teams based on the number of individuals quitting or being fired and having their careers alienated. This sense of frustration indicated a career risk, despite the significant commitment and dedication radical innovation demands. The authors argued that the lack of a different compensation for radical innovation teams, a possible marginalization of careers due to project failure, and the dependence on the project success to grant bonuses and promotions could depreciate careers linked to radical innovation.

From the publication of this seminal paper linking innovation management and people management, many other innovation management scholars have engaged in this discussion, expanding the range of innovations types, as radical innovation can be a rare study object to find, and broadening the range of HR features linked to innovation management.

A sound theoretical background is essential to sustain a research thesis. When the first systematic literature review for this study on strategic innovation and HRM was made, it was detected that both innovation management and HRM literature barely explored the intersection between these topics. By then, scholars have given little attention to the subject, despite its importance. Seeck & Diehl (2017), in their literature review relating HRM and innovation, indicated that studies have paid limited focus to the distinction between strategic and incremental innovation for HRM.

The analysis of the papers from this literature review led this research project to new directions. Hence, there was a need to probe into themes brought by the literature in its first analysis that emerged from the exploratory research process. They were: HRM practices linked to innovation, specifically on evaluation, incentive, and development; the influence of the CEO in innovation development; innovation talent management and retention; and innovation roles and positions.

The theoretical background enabled the perception of strategic innovation and HRM practices inconsistency, the importance of people experienced in innovation in TMT and through diverse levels of the organization's hierarchy, and a deeper understanding of the HRM practices used by established companies.

As the studies of the literature review used varied innovation nomenclatures to simplify the understanding and create cohesion between the literature review and the

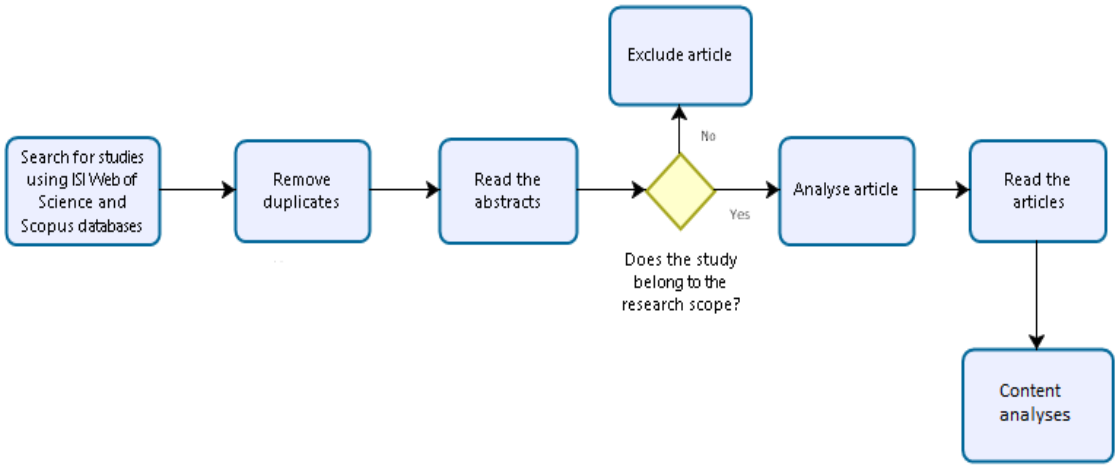
thesis as a whole, we will denominate as strategic innovation those which are among the used by O'Connor et al. (2018) to compose the strategic innovation, as depicted on Table 2.

3.1 BIBLIOGRAPHIC REVIEW PROCEDURE

The systematic literature review procedure followed the approach suggested by Carvalho et al. (2013). The authors argue that the identification of the most important academic papers and authors combined with content analysis allows the identification of literature trends and existing gaps.

The prospection of papers to build the theoretical basis for this research project was performed through five systematic literature reviews. First, a study on strategic, radical, and breakthrough innovation related to human resource management, but only seven articles resulted from the search, and a snowball exploration was made. The second was a more specific literature review to identify incentives and evaluation HRM practices for innovation managers. The third literature review intended to understand the importance of a CEO experienced in innovation in highly innovative companies. The fourth review was about talent management to identify how to retain and develop innovation talents. Finally, a literature review was conducted to differentiate the various strategic innovation positions and define their respective roles. All the searches followed the workflow illustrated in Figure 2.

Figure 2: Literature reviews workflow.



Source: designed by the author.

The reviews were based on articles, review articles, and books from the academic databases Web of Science and Scopus using the terms shown in Table 1 for each review, in the categories management or business or engineering industrial or operations research management science or engineering multidisciplinary or engineering manufacturing at Web of Science, and business, management and accounting and engineering at Scopus.

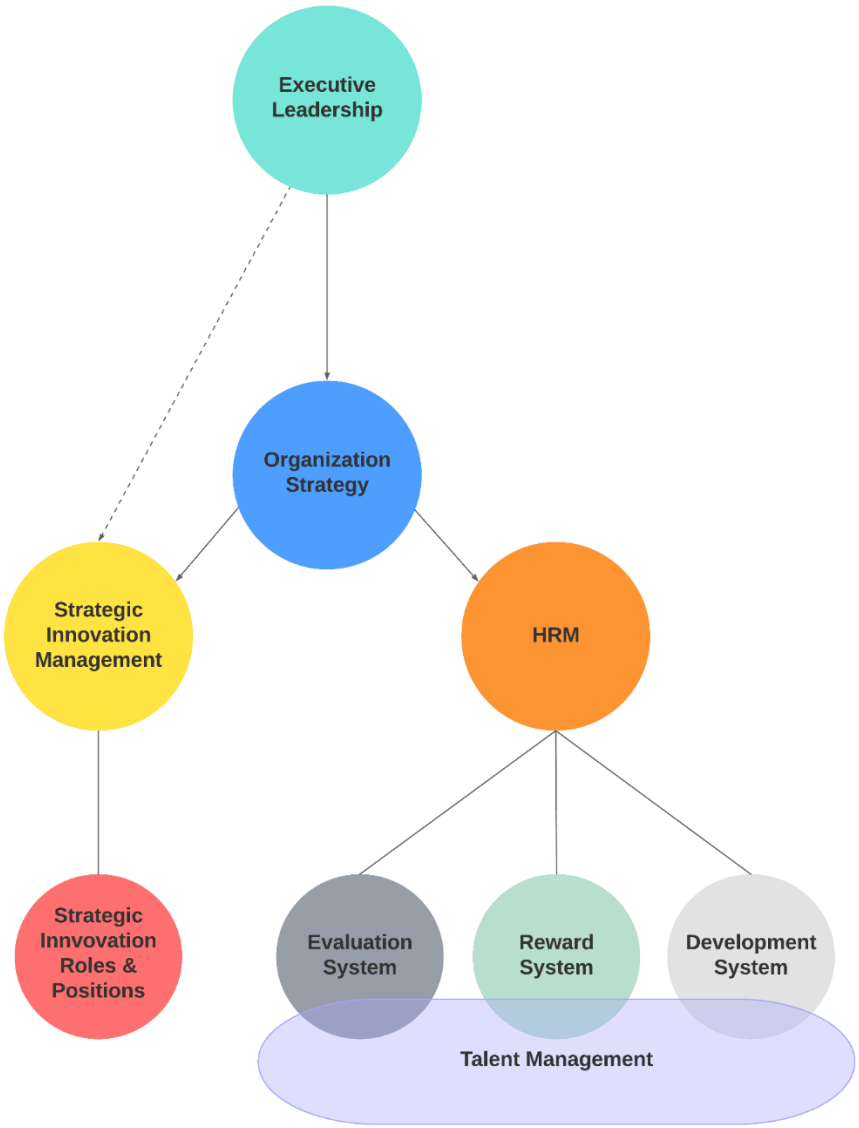
Table 1: Number of articles of the literature reviews through its workflow.

Literature review keywords	**Number of articles in the search**	**Number of articles after the abstract analysis**	**Number of articles after the content analysis**	**Latest date of the search**
“human resource*” and (“strategic innovation” or “radical innovation” or “breakthrough innovation”)	35	12	5	Oct 7th, 2016
	50	21	10	March 30th, 2019
	107	46	16	Sep 6th, 2022
((incentive or evaluation) and innovation and manager* and "human resource*")	41	15	12	June 18th, 2017
CEO and innovation	303	22	10	March 19th, 2019
roles and (“strategic innovation” or “radical innovation” or “breakthrough innovation”)	491	18	5	August 3rd, 2020

Source: designed by the author.

The first and primary review, about strategic innovation and HRM, was continuously renewed and complemented by a snowball search to identify the papers citing the most important papers detected in the first search. In addition, some articles on the subject that were not detected by the literature review, such as “The human side of radical innovation”, from O’Connor & McDermott (2004), “Building an organizational capability for radical innovation: The direct managerial role”, from Kelley et al. (2011) and the books “Beyond the champion: institutionalizing innovation through people”, from O’Connor et al. (2018) and “*Gestão da inovação (mais) radical*”, from Salerno and Gomes (2018) were included. With this approach, we aimed to identify the relevant literature to support the analysis.

Figure 3: Topics related to strategic innovation and HRM from the literature review.



Source: designed by the author.

The main organizational nuances identified in the papers analyzed at the beginning of this research project are presented in Figure 3. As innovation researchers published most of the papers that cover strategic innovation and HRM in journals focused on innovation, engineering, and technology, organizational issues such as strategy, structure, and innovation management approaches were commonly discussed. Therefore, the additional literature reviews expanded the topics closely related to HRM: HRM practices, talent management, and positions related to strategic innovation and the role of the company's TMT.

This thesis did not deepen individual aspects of the subject, such as motivation, individual career, and leadership style, as they are out of production engineering's scope. However, personal issues and motivations brought by the interviewees were utilized in the discussion regarding the suitability of HRM practices for addressing the talent retention problems that companies aim to mitigate.

3.2 STRATEGIC INNOVATION

Innovations can range from incremental to radical in a wide variety of typologies brought by the innovation management literature. The strategic innovation construct was chosen as it encompasses innovations with a medium to a high degree of uncertainty in their development.

As introduced in Section 1, strategic innovation is defined by O'Connor et al. (2018) as the one that is intentionally developed by the organization and can create new lines of business both for the company and the market. The authors consider innovation as a continuum ranging through its degree of uncertainty, where strategic innovation are efforts that go beyond incremental innovations until totally new breakthroughs, as shown in Figure 1. While incremental innovation is defined as modifications of existing products and products redesigned to achieve cost reductions (Holahan et al., 2014), strategic innovation is distinguished by the rewards it can offer and characterized as long-term projects with high levels of uncertainty.

In order to enhance comprehension of the different forms of innovation utilized by O'Connor et al. (2018) in Figure 1 to illustrate strategic innovation, the definition for each type of innovation as characterized by the authors between incremental and strategic innovation is provided in Table 2.

Table 2: Definitions of innovation types presented in Figure 1.

	Innovation	Definition
Incremental Innovation		Modifications of existing products and products redesigned to achieve cost reductions (Holahan et al., 2014).
Strategic Innovation	**Evolutionary**	Based on the theory of biological evolution, Tushman & O'Reilly (1996) call evolutionary change gradual and slow improvements focused on adaptation to the ecosystem in which the company operates.
	Adjacent	Involves exploiting an existing business in a market that is new to the firm (Nagji & Tuff, 2012).
	Breakthrough	Entails significant alterations to existing business (Wheelwright; Clark, 1992). The same as radical innovation for O'Connor & McDermott (2004).
	Disruptive	Simplifies and makes existing businesses more accessible to overlooked markets (Christensen & Raynor, 2003).
	Radical	Creates a new line of business relative to products and processes, both for the company and the market. The novelty must have either unprecedented performance features or offer the potential for at least 5x improvement in performance or a minimum of 30% reduction in cost (O'Connor & McDermott, 2004).
	Transformational	Business development for markets that do not yet exist (Nagji & Tuff, 2012).

Source: designed by the author.

The strategic innovation's objective is to create changes in the market, use new technologies or new combinations of technology and gain access to resources, even with a high risk of loss (O'Connor et al., 2018). Given the rise of the significance of strategic innovation for established companies, it evolved from an infrequent and unpredictable emergence of a good idea from a persevering individual to structured innovation approaches with a variety of people in several roles, positions, and diverse skills to increase the fulfillment of these projects in a regular basis.

Fundamental decision-making concerning strategic innovations must be made at the company's TMT, besides the daily operational problem-solving issues (Tushman et al., 2011). Strategic innovation has a different nature from incremental. As defined by Knight (1921), there is a consensus concerning long-term discontinuities being related to uncertainty rather than risk assessments, timelines, and a planned sequence

of events (O'Connor et al., 2018; Salerno et al., 2015). Reducing the uncertainty perception of strategic innovations through a systemic view of the strategic innovation management system and a deep understanding of why strategic opportunities were suspended can be used to legitimize resource allocation for strategic innovation initiatives (Lettice & Thomond, 2008).

The nature of strategic innovation induces the need for different competencies (Sandberg & Aarikka-Stenroos, 2014), management approaches, and mindsets for decision-making (O'Connor et al., 2008; Oltra et al., 2022; Slater et al., 2014). Strategic innovation relates to project management methods based on learning and uncertainty mitigation (Salerno et al., 2015), non-financial-based evaluation methods (Cooper, 2014; Killen et al., 2008), the building of portfolio management architectures to separate and protect resources for more uncertain innovation (Chao & Kavadias, 2008), the management of uncertainties in innovation ecosystems (Gomes et al., 2018), and the legitimization of the problems faced by strategic innovation leaders in the management of high uncertainty innovation projects (Brasil et al., 2018).

3.3 STRATEGIC INNOVATION AND HUMAN RESOURCE MANAGEMENT

The organization's capacity to innovate is closely related to the employees' capabilities and motivation, as their output is needed to develop and implement strategic innovations (Seeck & Diehl, 2017). Nevertheless, the HRM strategy can vary significantly for incremental and strategic innovations.

Strategic innovation may benefit from self-selecting champions' endeavors supported by its sponsor. However, developing an organizational-level strategic innovation capability involves more formalized managerial procedures (Kelley et al., 2011). Strategic innovation may deviate from the existing rules and expectations of the organization, and its potential might be unclear in the short term. Therefore, companies started to develop a capability for strategic innovation to ensure it would occur frequently and created different innovation approaches to increase the fulfillment of these projects regularly (Andreeva et al., 2017).

HRM may actively support strategic innovation, as it can facilitate a blame-free climate within the firm by valuing innovation culture and strategy (Aagaard, 2017).

Individuals who work with strategic innovation are motivated by the company's culture, team atmosphere, coexistence with other creative individuals (Hebda et al., 2012), variety of activities, and learning about new subject areas (Fowinkel, 2014). Nevertheless, while firms cannot create intrinsic motivation, they can act to enable employees' work efforts and sustain their motivation levels (Marvel et al., 2007).

Their entrepreneur skills, who thrive in significant uncertainty circumstances, can benefit from the availability of enriching relationships, access to physical and financial resources (Fowinkel, 2014; O'Connor & McDermott, 2004), the legitimacy associated with an established company's reputation (O'Connor & McDermott, 2004). They are driven to participate in innovation activities by the will to be involved in nurturing new business and bringing value to the market (O'Connor et al., 2008) and their sense of achievement of something new, exciting and bring value to the world (Leifer et al., 2000; Marvel et al., 2007).

The profile of individuals who endeavor to work with strategic innovation is entrepreneurial. In other words, they are leaders who can manage by influencing technical and business teams, which are difficult to find. However, innovation projects are designated as fringe activities (O'Connor et al., 2018). Having an entrepreneurial orientation is vital when working with strategic innovation. Thus, the company's HRM system needs to design incentives to motivate and intensify innovation activities, leading to higher organizational performance, even in a turbulent environment (Urban & Verachia, 2019).

Managerial ambidexterity refers to the leader's capacity to effectively utilize, integrate and balance exploratory and exploitative approaches when needed (Choi et al., 2018; Mom et al., 2009; O'Reilly & Tushman, 2004). The organization's proactive development of ascending leaders' abilities to stimulate and combine exploratory and exploitative practices, a managerial ambidexterity capacity, positively influences strategic innovation outcomes (Choi et al., 2018). Pursuing both incremental and strategic innovation seems to depend on whether the company's environment compels managers to, consciously or not, ignore the positive aspects of strategic innovation opportunities or the negative aspects of incremental innovations. Thus, organizations need to reinforce the ability to equitably evaluate the strategic and incremental opportunities' value in developing the managerial ambidexterity capacity (Lettice & Thomond, 2008).

Strategic innovation projects require outstanding commitment and implicate hard work. However, given the low probability of success and the low frequency of strategic innovation, the risk of engaging in a strategic innovation career is high. Thus, companies need to ensure that people are continuously engaged (O'Connor & McDermott, 2004) and protected by a culture that tolerates failure (Shaikh & O'Connor, 2020). Marvel et al. (2007), Bruneel et al. (2012), Fowinkel (2014), and Kelley et al. (2011) also identified worries and frustration among individuals working with strategic innovation related to the greater responsibilities and risks of their projects.

Marvel et al. (2007) reported that corporate entrepreneurs responsible for strategic innovations were concerned about project failure even when the company had a history of risk acceptance and failure support. Their apprehension was linked to the possibility of a negative impact on careers if the management's attitudes toward risk acceptance might change in the future.

Bruneel et al. (2012) stated that strategic innovation project leaders claim their salaries and incentives did not meet the increasing responsibilities of the assigned job in one of their cases. The authors also argue that firms should refrain from guaranteeing the reassignment of strategic innovation employees in case of project failure to increase their commitment to the project. Although, from the two companies they explored, the case that did not wish to commit to the reallocation of the employees and intentionally used this argument to raise the strategic innovation employees' commitment, in practice, allowed most of them to return to their previous roles if the project fail or the individual chose to leave it.

Some of Fowinkel (2014) 's cases (38%) reported an increased career risk perception compared to the rest of the firm. One of the cases was particularly based on the cyclic and recent organizational restructures. The author stated that providing job security by reallocating project leaders to other strategic innovation projects in the event of project termination affects tolerance for failure.

Likewise, Kelley et al. (2011) declared that more than half of their cases cited concerns about the perceived career risk associated with strategic innovation projects' failure. The paper identified some practices to surpass the career risk shadow, like allowing a fixed time to find another position in the company or reducing the visibility of failed projects in the organization. However, the authors propose to leverage recognition and identification of employees with the will and wish to work with strategic

innovation and who have accumulated some expertise on strategic innovation when selecting project leaders as an opportunity to create HR programs and practices that differentiate and develop employees with these skills.

Strategic innovation projects stimulated based on strategic decisions rather than initiated by an individual effort may alleviate career risk by delinking strategic innovation projects' outcomes from the individual career path. Still, in risk-tolerant organizations in which a strategic innovation project is most strongly linked to an individual, the removal of career threats may incite human talent to focus on the project, providing positive results (Choi et al., 2018).

Whereas individuals working with strategic innovation in progress projects fear the project's failure, the engagement of a secret strategic innovation project, when it came to completion, its team members were reluctant to return to their previous job positions (Oltra et al., 2022).

Strategic innovation expertise, legitimized by a structured function, can bring significant competitive advantage to the company, as it can promote a leap in performance and leadership of companies and long-term wealth creation (Marvel et al., 2007; Seeck & Diehl, 2017). Thereby, the development of individuals through a strategic innovation function can ensure that strategic innovation managers, who are responsible for cultivating opportunities that lead to new platforms for the growth of the company, can eventually have the chance to interact with senior management and see innovation as a possibility for career growth (O'Connor et al., 2018).

The summary of the conceptual basis of strategic innovation management and HRM is presented in Table 3.

Table 3: Conceptual basis on strategic innovation management and HRM.

Paper	Title	Contribution	Sample and analysis
Leifer et al. (2000)	Radical Innovation: how mature companies can outsmart upstarts	Identifies managerial competencies for radical innovation management.	5-year study of 12 radical innovation projects from 10 major US corporations.
O'Connor & McDermott (2004)	The human side of radical innovation	Discuss organizational factors that leverage and hinder the human side of radical innovation development.	6-year study of 12 radical innovation projects from 10 large established US-based firms.
Marvel et al. (2007)	Examining the technical corporate entrepreneurs' motivation: Voices from the field	Motivating factors for radical innovation workers: rewards, management support, resources, structure, risk acceptance, work design, and intrinsic motivation.	Multiple case studies of 17 US-based technology-dependent organizations.
Beugelsdijk (2008)	Strategic human resource practices and product innovation	Discuss the relationship between strategic HRM practices and the firm's innovativeness.	Survey quantitative analysis of 988 Dutch small, medium, and large firms.
Lettice & Thomond (2008)	Allocating resources to disruptive innovation projects: challenging mental models and overcoming management resistance	Identifies barriers to allocating resources to disruptive innovation related to rewards and mental models' beliefs about disruptive innovations.	In-depth qualitative case studies based on four manufacturing and service companies and small and large organizations from the UK.
Kelley et al. (2011)	Building an organizational capability for radical innovation: The direct managerial role	Examines the radical innovation manager role as an organizational innovation capability.	4-year qualitative analysis of 246 interviews in 12 large established US-based firms.
Cavagnoli (2011)	A conceptual framework for innovation: An application to human resource management policies in Australia	Investigates how the workplace social and organizational norms influence the learning to be innovative and proposes a framework to include innovation in HRM policies.	Utilizes the Australian Bureau of Statistics data from 2007 to analyze the theoretical background of HRM and innovation.
Bruneel et al. (2012)	Improving the success of radical innovation projects within established firms: Engaging employees across different hierarchal levels	Argues that the success of radical innovation depends on the commitment of the TMT, discusses the head of innovation role, and the HR mechanisms alignment with the high-risk profile of radical innovation.	Detailed field study of 2 radical innovation projects in 2 centenary-established Belgium-based firms.

Continue

Paper	Title	Contribution	Sample and analysis
Hebda et al. (2012)	Motivating and demotivating technical visionaries in large corporations: A comparison of perspectives	Explores similarities and differences in perception between innovation employees, managers, and HRM concerning motivating factors for innovation.	In-depth, multiple-perspective cross-case study of individuals in 3 different roles from 17 large, mature US-based technology-dependent corporations.
Fowinkel (2014)	Human resource management systems in new business creation: an exploratory study	Provides a framework for HRM systems for radical innovation new business creation project leaders.	Qualitative case study based on data of 8 German large companies that develop radical innovation.
Backes-Gellner et al. (2016)	Human resource management and radical innovation: a fuzzy-set QCA of US multinationals in Germany, Switzerland, and the UK	Explores configurations of key human resource management practices that explain radical innovation in multinational's subsidiaries. Firms apparently achieve radical innovations through functional flexibility.	Fuzzy-set QCA with data for 69 subsidiaries of US-based multinationals in Germany, Switzerland, and the UK, based on the varieties-of-capitalism approach.
Marx et al. (2016)	Organizational context variables to be considered in the reward system design oriented to product innovation	Discuss key variables to design reward systems focused on product innovation.	Qualitative case studies in 4 large-scale industrial Brazilian innovative companies.
Aagaard (2017)	Facilitating Radical Front-End Innovation Through Targeted HRM Practices: A Case Study of Pharmaceutical and Biotech Companies	Proposes HRM practices to facilitate radical innovation based on performance, appraisal, diverse and collaborative teams, champions' support, talent management, communication, culture, explorative leaders, and training.	Explorative case study of one in-depth and seven validation studies in international pharmaceutical EU and US companies
Andreeva et al. (2017)	When the fit between HR practices backfires: Exploring the interaction effects between rewards for and appraisal of knowledge behaviours on innovation	Examines the effect of rewards and evaluation's interaction on incremental and radical innovation. Findings showed that the positive effect of rewards is reduced by introducing evaluation practices for radical innovation.	Survey quantitative analysis of 259 Finnish companies with at least 100 employees
Cho & Kim (2017)	Horizon problem and firm innovation: The influence of CEO career horizon, exploitation and exploration on breakthrough innovations	Proposes a mechanism to explain the relationship between CEO career horizons and breakthrough innovations and highlights how a CEO's motivation to protect short-term success affects the firm's innovativeness.	Analyzes data from the ExecuComp database and National Bureau of Economic Research patent citations file from 681 US firms between 1992 and 2001.

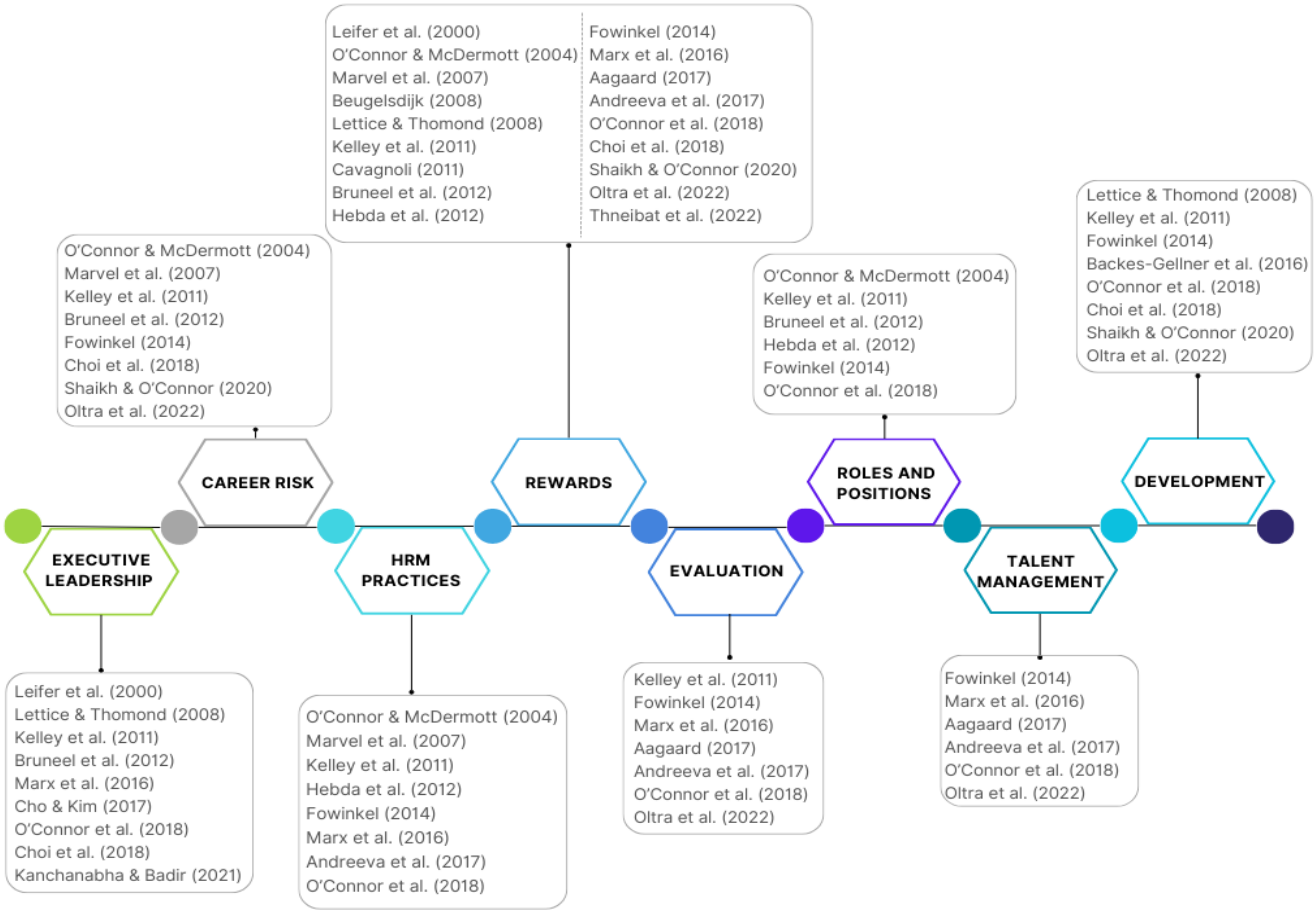
Continuation

Paper	Title	Contribution	Sample and analysis
O'Connor et al. (2018)	Beyond the champion: institutionalizing innovation through people	Discuss strategic innovation's requirements in organizational design, legitimized roles, and career tracks for its employees.	Four-year qualitative study of 11 highly innovative companies with concerns about talent management issues.
Choi et al. (2018)	Organizational conservatism, strategic human resource management, and breakthrough innovation	Identify and delineate strategic HRM practices that are likely to affect breakthrough innovation outcomes in large firms.	Survey quantitative analysis data collected from 79 US-based multinational firms.
Shaikh & O'Connor (2020)	Understanding the motivations of technology managers in radical innovation decisions in the mature R&D firm context: An agency theory perspective	Examine why mature R&D companies fail to build radical innovation capability despite their strategic intent. Results indicate that the firms' failure to align rewards and controls for radical innovation agents hampers the development of a system-wide capability for radical innovation.	Qualitative interviews with Chief Technology Officers, project managers, growth board directors, R&D managers, Chief Strategy Officers, and several others from 12 different companies.
Kanchanabha & Badir (2021)	Top management team's cognitive diversity and the firm's ambidextrous innovation capability: the mediating role of ambivalent interpretation	Examines the influence of the TMT's cognitive diversity (incremental and radical innovation capability) on organization's ambidextrous innovation capability.	Survey data collected from 50 Thailand-based firms in the electronics industry was analyzed through the common method variance CFA marker.
Oltra et al. (2022)	Facilitating radical innovation through secret technology-oriented skunkworks projects: Implications for human resource practices	Explores HRM practices that best support secret technology-oriented skunkworks projects: empowerment, autonomy, job and task design, team-based training, creativity-based evaluation, participative decision-making, open job descriptions, discreet recruitment, and employee flexibility.	Exploratory qualitative case study of a skunkworks project at Groupe PSA.
Thneibat et al. (2022)	Promoting radical innovation through performance-based rewards: the mediating role of knowledge acquisition and innovative work behavior	Explores the role of knowledge acquisition and innovative work behavior as possible mechanisms that define the relationship between extrinsic rewards and radical innovation.	Structural equation modeling using data from 235 managers in manufacturing and technology firms in Jordan.

Conclusion
Source: designed by the author.

The literature review on strategic innovation and HRM led to the constructs that emerged from the theoretical basis, as shown in Figure 4. These constructs were used to expand the literature review, coding process, and refinement of the research protocol.

Figure 4: Emerging constructs from literature review on strategic innovation and HRM.



Source: designed by the author.

The main aspects of each construct addressed by the strategic innovation and HRM theoretical basis presented in Figure 4 were deepened and will be detailed in Sections 3.4 to 3.6.

The strategic innovation capability development involves formalized managing procedures and structures (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; O'Connor et al., 2018), legitimate roles and positions (O'Connor et al., 2018) and the TMT's formal and direct involvement and support (Bruneel et al., 2012; Kelley et al., 2011; Marx et al., 2016).

Career risk

The perceived career risk associated to strategic innovation may be related to projects' failure (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004; Oltra et al., 2022); the lack of different incentives for strategic innovation teams (Bruneel et al., 2012; O'Connor & McDermott, 2004), the dependence of the project success to grant bonuses and promotions (O'Connor & McDermott, 2004), and cyclic and recent organization's restructures (Fowinkel, 2014).

However, this career risk perception may be diminished by tolerance for early failure (Fowinkel, 2014; Shaikh & O'Connor, 2020); job security through the guarantee of attractive relocation within the company (Fowinkel, 2014; Kelley et al., 2011); the reduction of the visibility of failed projects in the organization; the raised recognition, identification, and selection of employees with experience in strategic innovation to lead strategic innovation projects (Kelley et al., 2011); and the association of strategic innovation projects to the company's strategy and not to individual initiative (Choi et al., 2018).

Roles and positions

The strategic innovation team is usually formed by a small group of cross-functional individuals (Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004). Strategic innovation roles should be positioned through diverse hierarchal levels of the organization (Bruneel et al., 2012; O'Connor et al., 2018), including a Chief Innovation Officer (O'Connor et al., 2018).

Innovative firms need a more aware and informative means of selecting CEOs and TMT members with innovation expertise (Bruneel et al., 2012) and varied functional knowledge and competencies (O'Connor et al., 2018).

Talent management

Individuals who work with strategic innovation management should be stimulated by specialized talent management and development (Aagaard, 2017) and involvement in the job design and decision-making (Oltra et al., 2022). The lack of recognition of the individual's contribution to innovation or the misalignment between the perceived contribution to the company and the size of the reward can negatively affect strategic innovation employees' retention (Hebda et al., 2012). Nevertheless, HR

managers who work with strategic innovation employees do not distinguish the need to align innovation strategy with HR systems, usually adopting a universalist approach (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022).

HRM practices

Strategic innovation employees claim HRM personalized support (Marvel et al., 2007). HRM practices should develop strategic innovation competencies (Kelley et al., 2011; O'Connor & McDermott, 2004) through differentiated incentives and evaluation practices to enhance innovation (Andreeva et al., 2017; O'Connor et al., 2018), providing guidance (Kelley et al., 2011), clear communication and alignment when it is needed (Marx et al., 2016) through rich feedback. Some cases were observed in which strategic innovation areas proactively defined their own metrics to be assessed and passed them for HRM to execute (Aagaard, 2017; Fowinkel, 2014).

Evaluation

Assessment is a dominant HRM policy, as its results are used in decisions concerning salary, promotion, training, and financial rewards (O'Connor et al., 2018). Strategic innovation employees should be assessed subjectively (Marx et al., 2016), focusing on their innovation competencies, such as creativity to overcome problems (Oltra et al., 2022), entrepreneurial ability, broader-level motivation to innovate, risk-taking capacity (Kelley et al., 2011), shifting to quantitative indicators as the projects move into more advanced stages of development (Fowinkel, 2014).

Objective assessments for strategic innovation employees should focus on what is under the individual's control (O'Connor et al., 2018), with adjustable indicators linked to innovation activities and aligned metrics between areas participating in the project (Marx et al., 2016). The use of evaluation practices on strategic innovation employees may be more effective in solving uncertainties than financial rewards (Kelley et al., 2011).

Rewards

Reward systems are used to motivate strategic innovation employees (Andreeva et al., 2017). Despite that, there is evidence that innovative companies tend to use intrinsic rewards with strategic innovation employees, providing extrinsic

rewards exclusively for executive positions (Shaikh & O'Connor, 2020). Furthermore, there is a divergence in whether performance-based pay has a positive (Andreeva et al., 2017; Hebda et al., 2012; Leifer et al., 2000; Marvel et al., 2007; O'Connor et al., 2018; O'Connor & McDermott, 2004; Thneibat et al., 2022) or negative (Beugelsdijk, 2008) impact on the development of strategic innovation. The nature of the reward practice may explain this contradiction.

Performance-related financial incentives can incentivize and reward desired behaviors and outcomes as long as objectives are developed specifically for the high-uncertainty context of strategic innovation (O'Connor et al., 2018). Phantom stocks granted to the strategic innovation team may create a competitive climate in the organization. Its use may fail based on the difficulty of keeping the alignment of two business strategies shrouded in uncertainties and externalities (O'Connor et al., 2018).

Recognition and rewards to project leaders may be formally adapted and customized by strategic innovation managers (Hebda et al., 2012; Kelley et al., 2011). Besides, poor implementation of the reward system may discourage and resent strategic innovation employees (Hebda et al., 2012), and the mutual use of rewards and evaluation practices, when assessment is more emphasized than the incentives, may inhibit strategic innovation (Andreeva et al., 2017).

The HRM needs to balance individual and group-based achievement recognition and rewards to incentivize collaboration and inhibit competitiveness (Hebda et al., 2012; Kelley et al., 2011; Marx et al., 2016). Besides, the mutual use of a team-based appraisal and performance pay may stimulate employee innovative behavior (O'Connor et al., 2018).

Development

Career development can be promoted by the strategic innovation employees' visibility allowed by their frequent contact with TMT (Fowinkel, 2014; Kelley et al., 2011; O'Connor et al., 2018); the design of career paths for innovation executives and specialists, the use of innovation talent pools (O'Connor et al., 2018), and the simultaneous use of intrinsic rewards along with recognition practices (Kelley et al., 2011).

3.4 STRATEGIC INNOVATION ROLES AND POSITIONS

Most early strategic innovations developed in established companies originated and progressed based on the persistence of a talented champion supported by a senior management sponsor (O'Connor et al., 2008). The dependency on an individual champion, the lack of strategic intent for strategic innovation in the company, or the focus on one strategic innovation project at a time made the occurrence of strategic innovation projects infrequent, irregular, and unpredictable (O'Connor et al., 2008; Slater et al., 2014). Thus, the strategic development of future growth platforms in established firms cannot depend on the emergence of these rare individuals in the workforce (O'Connor et al., 2018).

To enrich strategic innovation outcomes, there is a need for people dedicated, engaged, and committed to managing strategic innovation (O'Connor et al., 2018) who have the flexibility to create different strategies to overcome environmental turbulences (Oltra et al., 2022), spread through diverse hierarchal levels of the organization, enabling the balance between the contradictions of core business and innovative initiatives throughout the company, given the complexity and resource-intensity of the strategic innovation process (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011). It encompasses the TMT's direct involvement in strategic innovation projects and the boundaries of the head of innovation role (Bruneel et al., 2012), personally ensuring the coordination of actions between the core business and strategic innovation to promote the continuous negotiation and communication amongst technical, commercial, management and shareholder requirements (Lazzarotti & Manzini, 2018). It is advocated that decision-making systems should include project members in confidential strategic innovation projects, and their opinions should have a significant weight concerning project design and goals, as they are highly committed and skilled workers who are experts in their knowledge fields (Oltra et al., 2022). However, O'Connor et al. (2018) claim that few companies have formal and steady roles associated with strategic innovation development beyond the core business. Legitimate roles that persist and are re-occupied in case of vacancy could enhance strategic innovation capabilities.

In O'Connor et al. (2018), the authors allocate some strategic innovation roles according to the D-N-A model presented by O'Connor et al. (2008) to manage strategic innovation in established firms. The D-N-A model is characterized by the

competencies, usually named as the phases of discovery, incubation, and acceleration, through which strategic innovation projects have to undergo from idea to launch. Discovery involves the creation, recognition, articulation, and elaboration of opportunities by combining ideas or technologies that enable the creation of new platforms. Incubation is distinguished by the experimentation of the diverse aspects that involve the project, such as technology, market, and economic models, until the mitigation of uncertainties makes it possible to explicit a business case. Acceleration is linked to investment focused on stimulating growth, taking incubation processes to the next level to quickly scale the business so that it can sustain itself and reach the company's competitive product level.

3.4.1 Strategic innovation team

The *strategic innovation team* is usually formed by a small group of cross-functional individuals (O'Connor & McDermott, 2004) who are passionate about engaging in strategic innovation (Kelley et al., 2011). Hereafter, several roles and positions related to strategic innovation management within the strategic innovation team will be depicted. It is clear that each organization will present its own structure of positions and roles for strategic innovation according to its division of labor choices (Burnes, 1997; Sitter et al., 1997), which may or may not be represented in the literature.

Strategic innovation projects may be led by champions or project leaders.

The *champion*'s role is characterized by a visionary technical employee's voluntary assignment to the task of leading a strategic innovation project from ideation to commercialization within the company, overcoming uncertain obstacles, and facilitating the implementation process (Hebda et al., 2012). The champion must have exceptional leadership skills to follow the scale of project maturation throughout the creation, development, and market launch stages, besides the perception of a potential market solution and its revenue results (Hebda et al., 2012; O'Connor & McDermott, 2004). Champions are intrinsically motivated and strategically use organizational structure to persist in their strategic innovation endeavors (Hebda et al., 2012). In spite of some similarities between the champion and project leader's roles, the champion is an individual's voluntary endeavor, which is not an institutionalized position like the

project leader. Hence, the HRM systems do not encompass the champion's role since it is out of the scope of an individual's formal position in the organization.

The *project leader*'s role requires uncertainty monitoring, establishing the priority of attendance focus at each moment, and deciding which of the multiple possible directions to take (O'Connor & McDermott, 2004). Thereunto, it demands business building experience through varied business units, its integration and profit and loss understanding; broad thinking, combining diverse expertise and visions; dealing with ambiguity, combining technologies, learning continuously, creating business in scenarios that do not yet exist; intrinsic motivation to engage in strategic innovation; and empowerment and accountability balance (Kelley et al., 2011).

Besides project leadership, the literature highlights some roles and positions related to strategic innovation.

Idea generators discover interesting technical features which require profound technical expertise. They usually are bench scientists (O'Connor & McDermott, 2004).

Opportunity generators or *recognizers* are responsible for identifying and elaborating potential commercial applications to technical discoveries and new business concepts that meet the company's strategic intent (O'Connor et al., 2018; O'Connor & McDermott, 2004). Such a role demands an extensive knowledge of different technological arenas and potential application markets, in addition to a keen curiosity. They generally are low or mid-level research managers and can either seek applications for discoveries made by idea generators or demand technical discoveries for a recognized opportunity (O'Connor & McDermott, 2004).

Project alumni are individuals who join the project team temporarily and may return to the strategic innovation team at times, rotating in and out of the project, alternating with work in other areas of the company. This role is explained by the need for specific specialists during some parts of the project, the project's long duration, and its turbulent nature (O'Connor & McDermott, 2004).

Opportunity domain leaders operate at the discovery phase, dealing with opportunity platforms. They build a pipeline of elaborated projects aligned with the company's strategic intent and coaching opportunity generators (O'Connor et al., 2018).

New business creation specialists take opportunities from the discovery portfolio to the acceleration phase. They analyze and test the opportunity from every angle to unfold whether or not and how it has a technical, market, resource, economic and competitive potential to become a relevant new business platform for the firm. Their responsibilities encompass making a business proposal and recommending the abandonment of the opportunity or reallocation of innovations that seem incremental (O'Connor et al., 2018).

Innovation facilitators, called by Roberts & Fusfeld (1980) as gatekeepers, help to overcome barriers to strategic innovation's acceptance by scanning the innovation environment, conferences, benchmarking other companies to be updated on the emerging innovation management techniques (O'Connor et al., 2018; Roberts & Fusfeld, 1980); communication and training of those tools and processes; facilitating strategic innovation events for idea generation and senior-level meetings to align the firm's strategic innovation intent and its progress; and providing strategic mentoring and motivation to strategic innovation teams (O'Connor et al., 2018).

3.4.2 Strategic innovation manager

The *strategic innovation managers* are senior technical managers who directly manage strategic innovation project leaders (Hebda et al., 2012) or the strategic innovation team leader (Kelley et al., 2011). The strategic innovation manager is responsible for the continuous motivation of project or team leaders and acts as a bridge between projects' leadership and the TMT as the head of the innovation unit (Bruneel et al., 2012). They provide formal guidance and motivation maintenance, allowing project leaders' empowerment and yielding them rewards when they are under the innovation unit's control and recognition within the firm while requesting clear path results and details through frequent alignment meetings (Kelley et al., 2011). These managers may be in a position to formally adapt and customize recognition and rewards to project leaders (Hebda et al., 2012).

As managers reconstruct their ambiance actively, deciding what to adjust and what to retain (Isabella, 1990), the innovation managers' importance increased as they support and secure resources for innovation projects, besides managing complex project portfolio management tensions for resources (Jonas, 2010). The managerial

role for innovation encompasses having a wider perspective of the organization, a clear focus on new opportunity creation, and with access to information and resources, they can provide connections for project leaders in order to overcome barriers and ensure the alignment of the project with the organization's strategic intent, while tolerating risk and uncertainties (Kelley et al., 2011; Probst et al., 2011).

Innovation managers define the principles to be applied and the goals to be achieved, that is, the organizational framework of the business (Foss & Klein, 2014). They identify individuals who have the necessary skills to lead innovation projects, provide encouragement, reinforce the organization's objective, and promote collective understanding and interpersonal trust, and, as a consequence, outline an innovative culture and raise the receptiveness for innovation in the organization (Kelley et al., 2011). Therefore, managers can make strategic innovation be at the core of the organization's activities. The innovation manager needs to embrace the creativity of the innovator, the knowledge of a specialist, and the leadership to develop others. The combination of these skills enables the development of communication and networking skills, strategic mindset capabilities to deliver outstanding results (O'Connor et al., 2018), and driving innovation on a disruptive trajectory (Sadiq et al., 2021).

A well-connected and legitimate strategic innovation manager's reputation owned within the firm and internal network created and nurtured through the diverse hierarchical roles performed over the years can positively influence strategic innovation success (Bruneel et al., 2012). Internal networks may be considered the most important skill of strategic innovation leaders, which supports the choice of leaders developed internally (Fowinkel, 2014). A long tenure gives them the knowledge of whom to contact to influence and overcome barriers, especially when the manager has created a good relationship with the TMT and is part of the innovation board (Bruneel et al., 2012). This legitimation allows them to confer protection to strategic innovation projects and their leaders from organizational obstacles, such as fighting for resources with other business units (Hebda et al., 2012) and knowing how to prioritize the leaders' multiple requests (Bruneel et al., 2012).

Therefore, strategic innovation managers need to deeply understand strategic innovation's organizational challenges project leaders and champions have to overcome and must be carefully selected and developed to increase the strategic innovation output (Hebda et al., 2012). The development of managerial ambidexterity

competence in strategic innovation managers contributes to strategic innovation performance once they control resources and can provide knowledgeable support to strategic innovation management processes (Choi et al., 2018).

The *orchestrator*, a position that holds some similarities with the strategic innovation manager role, is responsible for the strategic innovation function's operation and the alignment of its portfolio with the company's capacity for innovation. They communicate, defend and support strategic innovation portfolio, serving as the chief innovation officer's associate in the execution of priorities and the pursuit of objectives (O'Connor et al., 2018).

Functional managers also play an important role in strategic innovation. They are deeply experienced and compromised representatives of all the areas required to accelerate a mature business: operations, logistics, engineering, finance, etc. To conclude, deliver and launch strategic innovations at the most critical and expensive part of its development. They need to be creative problem solvers as emerging new business challenges arise (O'Connor et al., 2018).

3.4.3 Top management team

One of the main contributions from an executive innovation leadership to strategic innovation is the creation of an innovative culture in order to make it more natural, accepted, and valued (Leifer et al., 2000) by the use of communication, storytelling, and kick-offs, for example (Aagaard, 2017). An organizational culture specifically designed to deal with strategic innovation and a senior leadership prepared to guarantee it are core elements of a strategic innovation capability (Slater et al., 2014). In addition, the ability to build legitimacy for projects with high uncertainty (Brasil et al., 2018) and to prepare organizational structures to create safe environments for strategic innovation are key issues for leadership aiming to foster innovation (Chandrasekaran et al., 2015), preventing these structures to be dissolved when the individuals who hold these positions leave the organization (O'Connor & McDermott, 2004).

A cognitively diverse TMT, that is, which differs in their beliefs, knowledge, values, assumptions, and preferences, significantly impacts decisions about strategic innovation issues that can be viewed simultaneously positive and negative for the

organization since useful information and complex knowledge can be discussed fluidly, enabling a broader deliberation of possibilities and effectiveness of decisions (Kanchanabha & Badir, 2021). Positioning people experienced in strategic innovation in prestigious TMT roles affects the firm's commitment to innovation (Garms & Engelen, 2019), as the TMT has a significant impact on strategic innovation (Wang et al., 2019). Thereby, firms may realign basic structures, strategies, and processes to handle conflicting incremental and strategic innovation requirements periodically (Kanchanabha & Badir, 2021).

Strategic innovation projects' success requires the formal involvement of the TMT in established firms. Their support can positively influence the projects' development through the mobilization of the necessary resources (Bruneel et al., 2012), the use of reward systems to ensure the concurrent pursuit of strategic and incremental innovation (Lettice & Thomond, 2008), the provision of motivating initiatives to engage in strategic innovation (Choi et al., 2018), and their role as evaluators, giving guidance, coaching and solving problems (Kelley et al., 2011). TMT's executives and stakeholders of companies pursuing strategic innovation as a commanding path of an enduring business are challenged to allocate resources to strategic innovation if the employees are tied to historical accomplishments. In that sense, preparing the workforce for future changes may encourage strategic innovation endeavors (Lettice & Thomond, 2008).

The involvement of the TMT may occur through the *innovation committee*. An innovation committee needs to be aware of incubating and accelerating projects of the strategic innovation portfolio, as these require a large amount of investment and strategic reconsideration. The lack of engagement of the TMT in the company's strategic agenda is a challenge since when the few executives that sponsor innovation leave this role, the commitment to the strategic innovation projects vanishes (O'Connor et al., 2018).

Strategic innovation managers may develop their careers and reach TMT positions through a strategic innovation function structure (O'Connor et al., 2018). This movement of considering strategic innovation as an organizational function (Bagno et al., 2017; O'Connor, 2012; O'Connor et al., 2018) requires the awareness and engagement from the TMT to decide, sponsor, and coordinate the organizational redesign. Organizational functions dedicated to strategic innovation are based on

organizational arrangements with distinct leadership, metrics, terminology, career paths, and enduring influence (da Silva et al., 2014; Melo et al., 2020; O'Connor, 2012; O'Connor et al., 2018; Salerno et al., 2015). Therefore, the TMT should be aware of this need and pursue a management ability to promote the organization's changes required by strategic innovation.

The influential position of the *Chief Innovation or Technology Officer* (CIO or CTO) as a decision-maker plays a critical role in determining the outcomes of strategic innovation. Although it is still an infrequent position, it is possible to say that this position is being disseminated among companies willing to produce strategic innovation systematically. CIOs are strategic, systematic viewers and are motivated to use the organization's resources and knowledge to solve highly complex problems (Chung & Kang, 2019; O'Connor et al., 2018). Yet, the CEO and other members of the TMT of established companies can also hold the CIO position, accumulating core business and innovation activities (Garms & Engelen, 2019).

The CIO's primary responsibilities are not only to ensure the legitimacy of the strategic innovation function and its projects through an innovation culture and synergy of the function with the organization's strategy but also to manage the portfolio of new business platforms properly, nurturing and maintaining the innovation management system (O'Connor et al., 2018). A strong Chief Officer dedicated to innovation in the TMT can overcome opposing forces from other functions to guarantee resources to strategic innovation and the TMT's engagement with strategic innovation (Garms & Engelen, 2019). The CIO needs to develop a trusted and confident relationship with other leaders to surpass resistance by enlightening them about the unfolding realities of strategic innovation markets, aligning the expectations of its outcomes and impact on the organization (O'Connor et al., 2018).

The CIO can also support the CEO in acknowledging the instinct to decide in favor of operational excellence and short-term results and have a more systematic and strategic view that encompasses an innovation mandate on daily decisions. This task of managing the interface with the other functions and the CEO is hampered by the focus on the future of the strategic innovation function. Consequently, there must be a connection between the innovation actions and investments with the company's current condition and an effort to make their peers consider issues beyond the current (O'Connor et al., 2018).

Thereby, a CIO who possesses diverse functional knowledge and experience, particularly in marketing and management, in addition to their technological expertise, along with a broad understanding of different industries, has demonstrated superior performance in strategic innovation (Chung & Kang, 2019). Additionally, the wide-ranging experience encompassing the various stages of strategic innovation management, spanning from discovery to delivery, as well as other business units, enables the development of skills that qualify the CIO to comprehend multiple environments and cultivate a meaningful network with diverse actors (O'Connor et al., 2018).

Moreover, any power based exclusively on the expert knowledge of a CIO can hardly motivate the other executives of the TMT to commit resources to strategic innovation (Garms & Engelen, 2019).

3.4.4 Chief Executive Officer

The importance of having a *CEO* experienced in innovation projects in companies that pursue a strategic innovation capability is highlighted by the individual inclinations and cognitive characteristics for explorative and exploitative activities that can influence strategic decision-making on allocating resources for innovation projects, affecting the firms' engagement with innovation as a crucial driver of firm innovation performance (de Visser & Faems, 2015; Garms & Engelen, 2019). An expert leader with outstanding knowledge and ability concerning core business activity and industry experience can bring great value to organizations (Goodall & Pogrebna, 2015).

The discovery and development of strategic innovation require the TMT to have an awareness of external opportunities and an anticipation of future events. These factors are indicative of the company's innovation outcomes. By emphasizing external factors, the organization can swiftly identify emerging technologies and promptly develop products based on these technologies, providing responsiveness for future actions (Yadav et al., 2008). Accordingly, a CEO who prioritizes innovation should possess the capability to foster opportunities for knowledge creation and integration. Furthermore, they should actively promote and implement this innovation vision and orientation within the company (Caridi-Zahavi et al., 2016).

As the most prestigious position within the company, the CEO carries the expectations of the executive board, shareholders, and the media (Goodall & Pogrebna, 2015). Nevertheless, CEOs often face pressures to prioritize short-term profit increases, driven by the need to mitigate risk and meet market forecasts. Consequently, they may succumb to these performance pressures, resulting in suboptimal investments and reduced long-term expenditures, hindering and unprotecting future innovation (Cummings & Knott, 2018; Keum, 2021; Xiong et al., 2020; Yu & Lee, 2018). Taking risks is inherently associated with ventures that operate within highly uncertain environments, particularly those that are knowledge-based (Naeiji & Siadat, 2019). Besides, innovation activities may be negatively impacted by the TMT members' turnover, as they tend to make adjustments to the organizational structure, changing its internal members and innovation strategy (Xiong et al., 2020). In fact, a CEO's lengthy tenure reinforces the company's commitment to innovation (Garms & Engelen, 2019).

Another factor that contributes to the risk aversion of CEOs is the fact that, when they reach this position, they are often approaching retirement age. At this stage, there is a natural desire inclination to safeguard their past achievements and prioritize short-term success, as the financial return of strategic innovation is not immediate (Cho & Kim, 2017). Similarly, departing CEOs and TMT members often try to maximize gains towards the end of their tenure by reducing R&D expenses. This can result in an increased rate of personnel departure within the R&D area, as well as interruptions and changes in ongoing innovation initiatives (Xiong et al., 2020).

This risk-averse behavior relied mainly on short-term market-driven performance, financial control, and corporate portfolio management, which tend to select projects with clear, quantifiable net present value benefits, hampering higher risk and uncertain projects (Daellenbach et al., 1999; Gomes et al., 2019; Koch et al., 2017). Companies that aspire to long-term outcomes decline when relying mainly on market-driven behavior, financial control, and corporate portfolio management, caused by an over-reliance on marketing, financial and legal executives on the TMT that tend to select projects with clear, quantifiable net present value benefits, hampering higher risk and uncertain projects (Daellenbach et al., 1999).

Considering that innovation mediates the relation between organizational ambidexterity and performance (Alamayreh et al., 2019), companies with a solid

strategic intent on innovation that have CEOs without technological-domain expertise tend to have a decline in innovation performance (Cummings & Knott, 2018). The researchers examined the relationship between the inside and outside CEO, R&D productivity, and technological domain expertise by analyzing data from Wharton Research Data Services' databases by analyzing data from 1992 to 2013. In other words, firms with a CEO with technological expertise have better innovation results (Cummings & Knott, 2018). Companies prefer to appoint CEOs who have an established internal network and great firm-specific experience on several levels (Koch et al., 2017). Thus, innovative firms need a more aware and informative means of selecting CEOs and TMT members with innovation expertise (Cummings & Knott, 2018; Daellenbach et al., 1999).

The relationship between CEO characteristics and firm innovativeness was modeled by Prasad & Junni (2017). The authors conclude that CEOs with a propensity to recognize risky decisions as possibilities to leverage their firm's competitiveness tend to propose and reinforce actions that are necessary to move forward in new and audacious directions when their organizational identification is high. These CEOs' leadership involves overcoming company rigidities, providing resources for innovation, and giving positive signals to the organization's members to pursue uncertain activities, increasing innovation performance (Prasad & Junni, 2017). Furthermore, strategic innovations can contribute to CEOs' reputation and legacy and be a signal of their ability since delivering such innovations requires combining internal and external resources and capabilities (Cho & Kim, 2017).

3.5 TALENT MANAGEMENT

Talent management is a structured way to work with human capital (Aagaard & Andersen, 2014). Considering that today the environment of most organizations is global, complex, dynamic, highly competitive, and volatile, organizations recognize that they have a critical responsibility to recruit, develop, deploy, manage, and retain their most valuable asset, namely talent. The consequences of not having the right people in the right places and the uncertainty as to which best practices to retain these talents have become a source of constant questioning and work (Beechler & Woodward, 2009). Building a culture that allows high-quality performers to work well can contribute

to developing a talented and motivated workforce, generating retention and competitive advantage (Kontoghiorghes, 2016).

Talent management is a strategic theme for HRM research and practices. Talent management may be considered a transformation process, where talents are the inputs to achieve outputs that are intensely related to the organization's objectives (Thunnissen et al., 2013). This implies that talent management is a field in development, but talent management definitions converge regarding its relation to the firm's strategy and objectives. Thus, talent management is understood as a dynamic process and involves many HR processes, including attraction, development, engagement, and retention of employees in strategic roles of a company (Davies & Davies, 2010). On the other hand, some scholars propose an understanding that goes beyond the economic benefits and also considers individual and societal well-being. They argue that, besides financial rewards and job security, individuals' employment preferences include challenging work that provides growth opportunities, respectful and fair context, and social needs (Thunnissen et al., 2013).

The implementation of talent management practices can assist innovative companies in cultivating expertise for strategic innovation, establishing it as a long-lasting organizational capability. However, developing and retaining innovation talent is a challenge for companies, as it is not clearly manageable, and organizations are leaking talent in the innovation area (O'Connor et al., 2018). Individuals who can recognize the connection between effort, performance, and rewards are more inclined to actively participate in entrepreneurial initiatives (Urban & Verachia, 2019). In addition, the retention of knowledge-based employees is impacted by risk-taking activities, as they aim for strategic innovation development and opportunity exploitation (Naeiji & Siadat, 2019).

The companies considered innovative are strongly affected by the difficulty of retaining their employees. Many of them, interested in competing based on strategic innovation, have provided people with stimulating innovation-based assignments and jobs or allowed intrapreneurs the freedom to break the rules. But most organizations are not providing realistic opportunities for innovation careers. Notwithstanding, organizations can retain people in strategic innovation through the legitimation of innovation as a permanent function, differentiated assessment and reward systems, development of career paths within innovation (O'Connor et al., 2018), their

involvement in the job design and decision-making (Katou & Budhwar, 2010; Oltra et al., 2022).

With the identification of focal positions, companies are able to develop and retain their talents and manage their organizational knowledge. The departure of talents also means the loss of knowledge capabilities and can stifle the companies' ability to innovate and sustain their competitiveness (Kong et al., 2013). However, some employee turnover can benefit organizational knowledge as firms can hire externally experienced talent to have access to new knowledge, optimizing the benefits from existing human capital (Aagaard & Andersen, 2014; Kong et al., 2013).

There is a wide discussion in HRM about the definition of talent. Theoretical approaches to talent are grouped into object and subject. The object approach views talent as a natural ability, mastery, commitment, or fit. That is, it is related to people's skills and characteristics and their individual contributions to a firm. The subject approach considers talent as all people or as some people's subject (Gallardo-Gallardo, Dries, & González-Cruz, 2013).

The subject approach presupposes a choice where talent can be managed inclusively or exclusively. The inclusive approach sees as talent everyone in the organization, while the exclusive approach is based on the notion of workforce segmentation. While there is no rule for applying the term talent, since both approaches have some benefits, organizations should align the talent management approach to its strategy model, developing HR policies that contribute to employee performance. An organization where employees have the same responsibility and contribution with strategy can use an inclusive approach, while an organization that needs different levels of responsibility can use an exclusive approach (Gallardo-Gallardo et al., 2013). In contrast, the innovation management literature emphasizes the extensive use of an inclusive approach in innovative firms (Fowinkel, 2014; Hebda et al., 2012; Marvel et al., 2007; Marx et al., 2016) and the need for differentiated HR systems for innovators (Aagaard, 2017; Aagaard & Andersen, 2014; Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004).

HRM usually creates mechanisms to motivate the firm's general community more than special sets of employees. Individuals who work with strategic innovation management differ from the average population of employees in what they do and how they are motivated (Marvel et al., 2007). The practice of assimilating and leading in

highly uncertain environments is an unusual and rare skill (Kelley et al., 2011) and should be stimulated by specialized talent management, development, recruitment, and training as they enhance their capabilities and experiences (Aagaard, 2017; Kelley et al., 2011).

Companies can retain talents in innovation through employee development, assessment, and reward HRM practices, leading firms to be more innovative and competitive (Aagaard & Andersen, 2014; Kong et al., 2013; O'Connor et al., 2018). In an organizational career management the company contributes to career development to increase the value and uniqueness of its workforce by investing in career development practices to retain talents that are hard to replace (de Vos & Dries, 2013). Performance appraisal contributes to the commitment to increasing performance demands, the nurturing of valuable competencies for the company, the support of strategic priorities, and a lower turnover intent (Björkman et al., 2013). Extrinsic rewards are related to employee retention since they give the employees a sense of getting a fair recompense for the work devoted (Hausknecht et al., 2009).

Hebda et al. (2012) discussed the HRM's view of strategic innovation champions and project leaders as talented innovation employees in established technological firms. The authors claim that, despite the explicit insistence of the interviewers to focus on the motivating and demotivating aspects of strategic innovation project leaders, HR managers kept responding to their perceptions based on employees in general, making no distinction to their different challenges and needs. Indicating that HR managers do not acknowledge the strategic innovation leaders' special needs, motivations, career risks, or the exceptional set of abilities required for this role. Marx et al. (2016), Fowinkel (2014), and Oltra et al. (2022) also stated the lack of awareness of the need to align the innovation strategy in the design of HRM systems, prevailing the adoption of a universalist approach.

The misalignment between the perceived contribution to the company and the size of the reward, or the lack of recognition of the individual's contribution to innovation, can be problematic to the strategic innovation employees' engagement and retention (Hebda et al., 2012). Such highly skilled individuals gather past success and usually have no difficulty in changing jobs and leaving the firm. Given these circumstances, their retention should be a prior concern in HRM system design (Marvel et al., 2007).

3.6 HUMAN RESOURCE PRACTICES FOR STRATEGIC INNOVATION

HRM aims to create individual and workforce performance in organizations. The attempt to moderate individual aspects is related to the ability, motivation, and opportunity to perform the job, while workforce performance is built by the relationships and networks among individuals and groups throughout the company, delivering organizational performance outcomes (Boxall & Purcell, 2011). Besides the practices designed by the HRM, the organizational environment also impacts individual and workforce motivation, providing opportunities and the development of desired abilities (Boxall & Purcell, 2011). The establishment and nurture of internal networks to promote rapid access to information and resources and the creation of supervision boards in order to maintain the continuity of projects in case of personnel changes are necessary to improve the effectiveness of HRM systems for strategic innovation in companies (Cavagnoli, 2011; Hebda et al., 2012; O'Connor et al., 2008). The informal relation of internal networks can reduce the probability of failure in strategic innovation projects (Cavagnoli, 2011).

Companies can retain innovation talents by following strategic HRM practices: differentiated employee assessment, reward and development systems, leading firms to be more innovative and competitive (Aagaard & Andersen, 2014; Kelley et al., 2011; Kong et al., 2013; O'Connor et al., 2018), considering the degree of innovativeness, business sector, the structural and environmental context of innovation projects and HRM activities (Aagaard & Andersen, 2014).

3.6.1 Evaluation

Organizations extensively use performance appraisal and rewards together to indicate their expectations and foster specific behaviors (Andreeva et al., 2017), being the assessment one of the most dominant HRM policies for development, as its results are used in decisions concerning salary, promotion decisions, and training (Katou & Budhwar, 2010). HRM holds the knowledge of how to motivate employees and the competence to design optimal performance measurement and appraisal systems for innovation profiles (Aagaard, 2017). In fact, the evaluation of innovation leaders is a critical aspect of the firm's management practices, as they deal with high ambiguity and commit to contribute to the company's objectives (Kelley et al., 2011).

Evaluating individuals who are involved in innovation can be challenging due to the inherent characteristics of strategic innovation, such as ambiguity, complexity, and uncertainty. These aspects pose difficulties for organizations when it comes to establishing clear performance standards (Andreeva et al., 2017; Fowinkel, 2014), lacking clarity surrounding its measurement (Larkin, 2014). Furthermore, traditional evaluation methods aimed at managers in established companies have typically relied on metrics such as the number of subordinates reporting to them and the size of the budget they oversee. However, this approach may not effectively assess innovation experts who often work with smaller teams and budgets, except when the project has reached an advanced stage. Innovation-related appraisals address the work effectiveness on the individual or collective level. The mutual use of team-based appraisal and performance pay to stimulate employees' innovative behavior (Aagaard & Andersen, 2014; O'Connor et al., 2018).

Many studies support the use of performance appraisal as a control mechanism. According to Larkin (2014), control within organizations can range from highly sophisticated to autonomous forms, and it can undertake both bureaucratic and social dimensions. Bureaucratic control is defined as formal mechanisms emphasizing reward. Social control is characterized by the promotion of autonomy within the organization, with the understanding that individuals are committed to the values and goals of the organization. Linder et al. (2015) highlight the differences between objective and subjective performance evaluation. The objective approach focuses on identifying factors that are within the control of employees to prevent demotivation. By emphasizing these controllable factors, organizations aim to maintain employee motivation and engagement. The disadvantage of objective evaluation is the difficulty of measuring the employee's contribution to firm value objectively. Conversely, it argues that firms employ a subjective approach in order to better account for uncertainty. However, subjective performance evaluation may be problematic, as it may lead to misunderstandings, bias, and perceived unfairness or manipulation.

Some types of performance appraisal measurements were categorized by Aagaard (2017) into quantitative or qualitative assessment, monetary or non-monetary appraisals, and individual or team performance measurement. In addition, Kelley et al. (2011) claim that performance-based appraisal for strategic innovation managers should assess their entrepreneurial ability, broader-level motivation for strategic

innovation, and organization and risk-taking capacity, which are difficult characteristics to measure. Foss & Klein (2014) argue that when knowledgeable individuals are key resources of the company, their evaluation needs to be more subjective. Marx et al. (2016) also advocate for qualitative evaluations based on innovation competencies, indicators linked to innovation activities, and the alignment of metrics between areas participating in the strategic innovation project, which can be adjusted when it is necessary. Whereas goals based on the SMART concept (Specific, Measurable, Achievable, Relevant, and Time-bound) may not be suitable for evaluating and rewarding strategic innovations. Oltra et al. (2022) propose an assessment based on creativity. Given the high degree of uncertainty of strategic innovation projects, it is expected that employees find non-obvious solutions to emerging problems.

The performance appraisal systems most observed in established companies by O'Connor et al. (2018) were highly related to the number of people reporting to the individual and the budget's size administered in order to decide about promotions, salary, and job classification. But innovation experts typically operate with smaller teams and budgets, except during the later stages of a project when it has advanced significantly. The high levels of uncertainty of innovation projects cause a series of factors that surpass the individual and team's control. Thus, the authors consider it more appropriate to assess the performance of people who work with innovation projects considering what is under their control, such as the gaining of new insights, the creation of partnerships, and the design of experiments, for example. It can result in new opportunities, relationships, and strategically driven business for the company, along with the retention of innovation talent. Table 4 exemplifies the possible metrics for strategic innovation roles proposed by the authors.

Table 4: Performance metrics for strategic innovation roles.

Strategic innovation role	**Performance metrics**
Opportunity generator	Identification of nonobvious, robust opportunities.
Domain leader	Provide opportunity options whose value is recognized as worthy of incubation investments; Identify projects that will be developed further.
Director of discovery	A motivated discovery team who is working to explore strategic new business of the future that the CIO and innovation portfolio board finds believable; A strong understanding throughout the company of the importance of scoping imaginative new business opportunities; Excellent partnerships with R&D and senior leaders.
New business creation	Use of creative approaches to mitigation uncertainty around opportunities; Clarity of communication.
Director New business programs	Successful guidance of an emerging business opportunity team to learn the actual value proposition across a variety of markets; Demonstrated successful transitions to other phases of strategic innovation; Successful internal stakeholder alignment.
Director of incubation	Bring new business proposals forward to the firm for which market enthusiasm has been demonstrated; Develop new business operation models that work and have some level of internal commitment behind it.
Functional leader	Demonstration of workable processes and practices and practices that will propel the new business.
Acceleration innovation Council member	Achievement of company innovation aspirations; Successful launch of new business revitalization; Successful assimilation of new business into mainstream corporation.
Innovation facilitators	Success in coaching and achieving meaningful outcomes of workshops; Impact of strategic innovation staging.
Orchestrator	Healthy, robust strategic innovation portfolio with at least some projects recognized for their way to making a recognized impact; Success in strategic coaching; Well-functioning innovation management system.
Chief Innovation officer	Ability to deliver new business and major strategic uplift in ongoing businesses; Recognition of the importance of strategic innovation across all members of the top management team.

Source: adapted from O'Connor et al. (2018).

Fowinkel (2014) identified that strategic project leaders determined, along with their superiors, metrics derived from the project's milestones to the evaluation process that was monitored and revised annually. These metrics were more qualitative in the early stages of strategic innovation projects, being monitored exclusively by the head of innovation in the companies, as their role typically has more autonomy when compared to their peers from the mainstream operations. Performance indicators

shifted to quantitative indicators as the projects moved into more advanced stages of development.

However, Aagaard (2017) identified that the metrics used in the assessment of the innovation division were first defined by themselves and then executed by the HRM. The HR area claimed there was a lack of integration with the innovation team, whereas the innovation area mistrusts the HR's familiarity with science, innovation's challenges, and certain aspects of the company's business to define their performance indicators. The result of this study concluded that performance appraisal is one of the main HRM practices for front-end strategic innovation but the least important of them. It would come after innovation culture and leadership, diverse and cross-collaborating teams, champion's support, talent management, and communication.

Andreeva et al. (2017) alert that the mutual use of rewards and evaluation, when they are linked to knowledge creation, sharing, and application, may hinder strategic innovation. In that case, when the level of usage of performance assessment was low, the effect of rewards on strategic innovation was stronger. Conversely, Kelley et al. (2011) claim that the use of evaluation practices in the selection of strategic innovation project leaders may be more effective in solving uncertainties than financial rewards.

3.6.2 Rewards

It is largely advocated by scholars that incentive and motivation practices are strongly correlated with innovation (Farouk et al., 2016; Katou & Budhwar, 2010; Koberg et al., 1996), as rewards foster innovative work behavior (Thneibat et al., 2022), and there is evidence that they may enhance the company's performance when they meet the competitive requirements of the firm's strategic intent (Beugelsdijk, 2008). Formal and informal motivational incentives need to be aligned to avoid a mismatch between what is informally encouraged and the demanded results to achieve formal rewards (Foss & Klein, 2014). Besides the motivation aspect, incentives are also important to attract and retain innovative personnel (Ottenbacher & Harrington, 2010) to support a viable internal labor market (Koberg et al., 1996).

Incentives, rewards, and corporate recognition are the traditional focus of HRM to motivate employees. Among the rewards are salary increases, individual and group financial awards, company professional awards, individual and group performance-

related pay, bonuses for new ideas creation, acquired knowledge or successful projects, share options, and participation in the financial success of projects (Bruneel et al., 2012; Hebda et al., 2012; Kelley et al., 2011; Koberg et al., 1996; Leifer et al., 2000; Marvel et al., 2007; O'Connor & McDermott, 2004). Intrinsic rewards like job security, esteem, opportunities, autonomy, empowerment, flexibility in working hours, public recognition of activities**,** and management support (Beugelsdijk, 2008; Cavagnoli, 2011; Fowinkel, 2014; Hebda et al., 2012; Katou & Budhwar, 2010; Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004; Oltra et al., 2022; Ottenbacher & Harrington, 2010; Shaikh & O'Connor, 2020) were also named. While promotions and formal careers are development processes (Aagaard & Andersen, 2014; Hebda et al., 2012; Kelley et al., 2011; Shaikh & O'Connor, 2020). The most relevant incentives found in the literature are presented in Table 5.

Table 5: Rewards used for individuals who work with innovation.

Type	**Rewards**
Extrinsic rewards	Participation on product success
	Share options
	Individual/group performance pay
	Individual/group awards
	Bonus/commission
	Salary increase
Intrinsic rewards	Empowerment
	Job security
	Esteem
	Opportunities
	Autonomy
	Flexibility on working hours
	Management support
	Public recognition of activities
Development	Career path
	Career opportunities
	Promotions
	Competences development

Source: designed by the author.

Rewards play an important role in finding the motivation to innovate, as they recognize their value and competencies (Andreeva et al., 2017), enhancing their commitment and satisfaction (Katou & Budhwar, 2010), and willingness to compromise

in various activities (Cavagnoli, 2011). The employees' attitudes determine the extent their capabilities are used for the benefit of the organization (Katou & Budhwar, 2010). The positive effect of extrinsic rewards on strategic innovation outcomes is higher in conservative companies, where risk aversion is more significant (Choi et al., 2018).

Nevertheless, motivating individuals that work with strategic innovation can be problematic from a traditional HRM perspective as these employees claim for personalized support that can be seen as an inequity within the company (Marvel et al., 2007), and if the reward system is not well implemented, will likely lead to discouragement and resentment, hindering innovation (Hebda et al., 2012). Entrepreneurial leaders that can manage both technical and business teams are difficult to find, and they are not appropriately rewarded (O'Connor et al., 2018).

While some scholars advocate that established firms should offer differentiated incentives for individuals who work with innovation, taking into account the individual's contribution (Koberg et al., 1996), rewarding long-term success, encouraging intellectual experimentation, and providing rich feedback (Zhang & Jin, 2014), in order to lead to higher levels of strategic innovation. Others claim that strategic innovation is collaboratively developed, and rewards based on individual performance may lead to a competitive environment, inhibiting cooperation, and information sharing. Hence, if the company wants to encourage innovative behavior, HRM needs to balance the individual and collective recognition and rewards to incentivize collaboration and indicate that individual and group delivery is important (Hebda et al., 2012; Kelley et al., 2011; Marx et al., 2016).

Whereas many papers claim that financial incentives can have a positive impact on the development of strategic innovation (Andreeva et al., 2017; Hebda et al., 2012; Leifer et al., 2000; Marvel et al., 2007; O'Connor & McDermott, 2004; Thneibat et al., 2022), for Beugelsdijk (2008) performance-based pay may have a negative effect on innovation.

Andreeva et al. (2017) studied the correlation between rewards and performance appraisal, considering strategic and incremental innovation in knowledge-based firms. They argue that knowledge behaviors are mostly driven by intrinsic motivation. Thus, when rewards are dominant over evaluation, it signs employees that their value and competencies are recognized, increasing knowledge behavior. Conversely, the emphasis on the evaluation aspect obstructs intrinsic

motivation. Their study concluded that if the level of usage of performance appraisal is low, the effect of rewards on strategic innovation is stronger, different from what happens with incremental innovation. And that rewards for strategic innovation indicate that risky behavior is supported by the organization. However, the mutual use of rewards and evaluation practices may inhibit strategic innovation.

Kelley et al. (2011) stress on the concurrent use of intrinsic rewards and recognition to motivate strategic innovation employees, which may lead them to the development process. The autonomy to run a strategic business allied to job security, to prevent risk aversion caused by the project's uncertainties and career distress, was considered by strategic innovation managers as an intrinsic reward itself. The recognition of gaining visibility through higher levels of the firm may professionally validate the manager's innovation efforts and expertise, yielding future promotions and reinforcing the company's desired behavior from these personnel.

Marx et al. (2016) declare that a reward system implementation aimed at strategic innovation needs a genuine intent to innovate from the firm, represented by solid support from the TMT; an alignment with other HR processes for innovation, reinforcing the same messages for employees; a strong involvement of the low and middle managers in the rewards system's design; and to prepare employees for the use of risk rewards, using clear communication, training, and impact analysis to manage changes.

Zhang & Jin (2014) proposed a situational experiment to be used as training to deal with strategic innovation challenges. The experiment is an innovation-motivating incentive scheme that displays substantial tolerance for early failure and reward for long-term success. The result of the experiment showed that employees tend to avoid risky innovation behavior and pursue their own interests when based on conventional incentives. However, the proposed incentive scheme was more suitable for leading the participants to accomplish innovation.

Managers from HR and strategic innovation agree to consider rewards and recognition practices as the most motivating category of HR mechanisms. Nevertheless, strategic innovation managers acknowledge intrinsic motivation as an important motivator in their career, differently from the HR managers' vision, which does not give the same value to intrinsic motivation as strategic innovation managers (Marvel et al., 2007). Autonomy is considered a key motivation element for most

strategic innovation leaders since they have sufficient freedom to control their workload and structure their tasks (Fowinkel, 2014), especially in projects operated in secrecy (Oltra et al., 2022).

One of the most promising financial incentives applied for strategic innovation employees observed in O'Connor et al. (2018)'s research was a performance incentive plan on which a set of objectives that were appropriate for the time period and maturity level of the project led to bonuses that were partially, fully or even beyond a 100% granted according to the degree to which the objectives were achieved in the period. This approach can encourage and reward the right practices, in addition to the alignment of the extrinsic with the intrinsic rewards system, if the objectives are specially developed for the high uncertainty context of innovation. Nonetheless, other structures of financial incentive observed by the authors can hinder innovation, such as granting phantom stock for the strategic innovation team, since it may create a competition mentality with other teams instead of a unifying identity within the company. Also, offering the spin-off of emerging business out of the organization, with the promise to buy it back in the future if the spin-off remains aligned with the company's strategic intent. The difficulty in keeping the alignment of both business strategies usually leads the company to fail on the promise to repurchase the business afterward.

Conversely, Beugelsdijk (2008) researched the relationship between HRM practices, incremental and strategic product innovation, and total sales performance, using a 988 firms' sample and found that decentralized organizational structures, empowerment, autonomy, and flexible working hours positively impact product innovations and standby contracts affects negatively any type of innovation. And, while performance-based pay is favorable to incremental innovation, but not for strategic innovation.

Shaikh & O'Connor (2020) observed most of their cases used intrinsic rewards with strategic innovation employees. One company provided early promotion for newly hired individuals working in the incubation phase, publicizing corporate entrepreneurship as a reward position. Another reward approach used by firms to seek opportunities is the promotion of innovation events, such as idea jams, innovation fairs, workshops, and conferences, awarding the selected employees' projects with seed funding and slack time, for example, aligning employees' behaviors with new

opportunity generation objectives. Extrinsic rewards were allocated by the TMT exclusively for executive positions, being reluctant to designate financial rewards to lower-level employees. The misalignment of rewards with the assessment metrics throughout strategic innovation stages results in a company's inability to develop a strategic innovation capability.

3.6.3 Development

Innovative companies can benefit from the ability to attract qualified, flexible, creative, and skilled individuals that are necessary for the development of their projects. They need to develop their employees' attitudes in order to encourage creativity, flexibility, the propensity to take risks, cooperation, long-term oriented behavior (Katou & Budhwar, 2010), versatility, adaptation to detect and rapidly learn to perform new tasks (Oltra et al., 2022). Career promotion is considered by Katou & Budhwar (2010) the dominant HRM incentive, which can be deployed in career development, career counseling, and formal career paths once it provides a sense of security.

The importance of designing career paths for strategic innovation employees arises and becomes critical as the expertise of these individuals increase. Even when the strategic innovation workforce claims to feel valued by their superiors and receive competitive wages, a lack of meaningful promotion within innovation becomes a challenge. The creation of career paths for innovation experts for those willing to stay in the strategic innovation function as they develop competencies to achieve leadership positions, such as general manager or director, which can happen through incubation and acceleration positions. A specialist career track can also be an alternative for those who do not aspire to leadership positions or an executive career. A parallel specialist career can provide recognition of the developed competencies and value to the organization while engaging in the activities they excel (O'Connor et al., 2018).

Employee development practices enhance knowledge transfer and support innovation. Focusing on development activities that emphasize skill reinforcement, human capital investments, leadership, and team-based activities is critical to developing cross-functional teams of innovative organizations (Aagaard & Andersen,

2014). The continuous update of knowledge on skills defined by the employee was signed as a key aspect of achieving strategic innovation, being successfully combined with a high-tech strategy (Backes-Gellner et al., 2016).

The development of strategic innovation talent may be performed by the use of talent pools. Companies may assess their promising employees according to some capability dimensions, identifying some of them as a talent to be part of the talent pools. Another possibility may be the use of a personalized approach. HRM and innovation directors can map a development plan for the individuals nominated as potential innovation talent within the strategic innovation function. This development map could have a set of knowledge, norms of behavior, and processes the individual needs to conduct new business creation activities, for example, and a person's attitude and mindset that differentiate people with innovation talent. In both cases, the innovation talent position would determine the assignment of training workshops, master classes, participation in critical experiences and projects, and events designed to give these talents the opportunity to practice and have feedback to strengthen and develop their potential (O'Connor et al., 2018).

A great part of the literature that discusses HRM and innovation focuses on rewards as a driver for innovative behavior (Aagaard & Andersen, 2014). O'Connor et al. (2018) stress on the great value of innovation expertise for the company and believe that it should be rewarded through promotion to retain individuals within the strategic innovation function and ensure that innovation leaders can eventually have the chance to interact with senior management and see innovation as a possibility for career growth, as they are responsible for cultivating opportunities that lead to new platforms for the growth of the company.

The HRM can have a long-term perspective on development, ensuring managers, directors, and executives, when returning from strategic innovation activities, are offered attractive leadership positions (Probst et al., 2011) based on the demonstrated new business creation expertise (Kelley et al., 2011). The strategic innovation management nature promotes the network between project leaders and other strategic innovation roles with TMT through decision-making committees, which promotes visibility to innovators and the possibility of career development (Fowinkel, 2014; Kelley et al., 2011).

4. METHODOLOGY

The research problem seeks to understand how the HRM system is applied to strategic innovation employees in established Brazilian companies that develop strategic innovation. The methodological approach selected for this research project was a multiple case study design to explore HRM systems for strategic innovation management in established firms. Given the scarcity of papers on this topic, the constructs that emerged from the literature review as the research was carried out allowed a deepening of the theoretical basis by using additional literature reviews on adjacent subjects.

Quantitative analyses of secondary data sources helped validate such constructs and verify the extent of the problems presented by the literature. Qualitative data from two organizations, each contending two mini cases, in addition to other three cases that were discarded as not to develop strategic innovation or canceled for external reasons, was collected to understand fundamental relations from HRM and strategic innovation roles in within-case analysis, followed by a cross-case analysis, to build reliable theory. Combining qualitative and quantitative data can indicate unseen relationships, avoid false impressions in qualitative data, reinforce qualitative evidence findings, and help understand quantitative evidence relationships (Eisenhardt, 1989).

Qualitative research is a powerful approach to generate unique and meaningful contributions to academics and organizations while advances the theoretical field (Gephart Jr, 2004). Accordingly, this research can benefit from an inductive qualitative research approach to attain its objectives, as new insights may emerge, widening the researcher’s epistemological frame with longer leaps than those based on quantitative data, which is particularly appropriate for understudied empirical contexts (Bansal et al., 2018).

4.1 RESEARCH DESIGN

Once the research problem has been defined, the research questions and constructs were outlined since these a priori specifications can help to shape initial theory-building research projects. The research questions were iteratively refined as

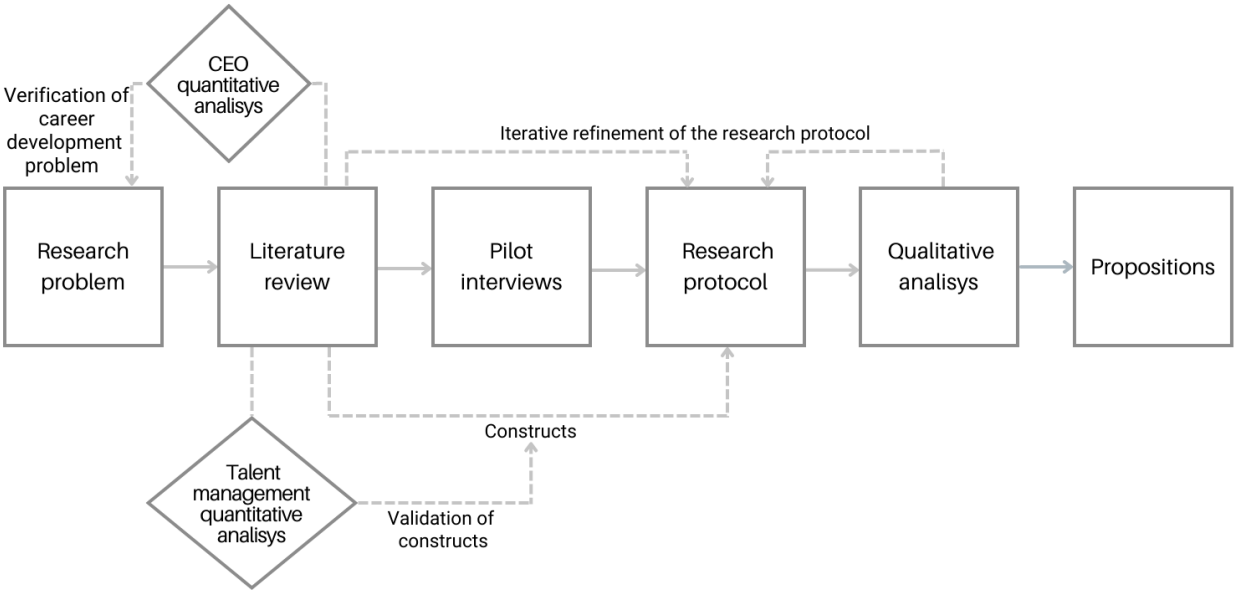
the research project evolved and new constructs involving the subject emerged (Eisenhardt, 1989).

The literature review enabled to determine the literature gap and build a theoretical background to support the empirical investigation. Conducting the study on the state of the art of the literature using the constructs of strategic innovation and HRM resulted in a limited number of articles and books, highlighting the scarcity of knowledge on the subject. The analyzed studies revealed and discussed many problems between strategic innovation management and HRM. However, they presented few and sparse solutions to these problems, reinforcing the need for an exploratory approach and further research to provide a clear theory-building pathway.

Considering that qualitative research methods can be addressed by diverse toolkits and philosophies to study and theorize the activities of firms (Gehman et al., 2018), the most prominent approaches were discussed as to how they could be applied to this research problem. Langley's mechanistic-historical processual approach (Langley, 1999) and Gioia's phenomenological-cognitive approach (Gioia et al., 2013) were also considered. However, the multiple case study design proposed by Eisenhardt (1989)'s "Theory building from cases" was selected to explore HRM systems and practices for strategic innovation management in established innovative firms.

This research approach was considered a good fit for this research project because building theory from case studies is a strategy that involves using cases to create propositions and theory from empirical evidence (Eisenhardt & Graebner, 2007). An exploratory and inductive view of the cases combined with an embedded design to investigate multiple levels of analysis can contribute to theory building, ensuring a methodological fit between the research questions and a scarce theoretical background. The characteristics of the methodology, as the iterative research process and juxtaposition of the evidence across cases, data, and literature, enable the convergence of a consistent new theoretical vision of how and why events occur (Eisenhardt, 1989). The research design is illustrated in Figure 5.

Figure 5: Research design diagram.



Source: designed by the author.

To acknowledge the key concepts of the subject and to verify the consistency of the research project with the HR's literature state of the art, pilot interviews were conducted with HR specialists, HR professors from the Studies in People Management Program (PROGEP) from the Faculty of Administration, Economics and Accounting at USP (FEA – USP) and HR consultants. These pre-test interviews validated the research protocol and captured possible interesting cases. The complete research protocol is presented in Appendix B.

Then, two quantitative analyses using secondary data sources were conducted to validate the constructs and problems characterized by the literature and assess the magnitude of the issues highlighted in the literature.

The first quantitative analysis was a longitudinal investigation performed between 2016 and 2020, which verified the previous experience of current CEOs in the most innovative companies in the world and Brazil to ascertain the difficulty of innovation leaders to reach such position in established innovative companies in order to assess the extent of the career risk problem appointed by the literature (Bruneel et al., 2012; Choi et al., 2018; Fowinkel, 2014; Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004). The analysis enabled the verification of the extent of

the career development problem discussed in the literature, providing a more comprehensive understanding of the phenomena under investigation.

The second quantitative analysis aimed to verify the constructs that arose from the literature review regarding HRM practices for strategic innovation, that is, evaluation and rewards. Therefore, in addition to the award for the most innovative companies in Brazil, we used the database of the Great Place to Work (GPTW) awards in Brazil, both from 2017, to compare the talent management practices that companies acclaimed as innovative used differently from traditional companies. By employing this approach, researchers were able to obtain empirical evidence that supported the relevance of the constructs derived from the literature review, besides revealing yet unobserved constructs related to strategic innovation and HRM.

Since the pilot interviews and both quantitative analyses were preliminary exploratory investigations of the research problem conducted to direct and pave the way for the qualitative analysis of the cases, their detailed methods, results, and discussion were presented separately in Sections 5 and 6, prior to the presentation of the qualitative analysis, given the iterative nature of the theory building from cases research process, in which new constructs emerge, and the coded categories may change over the time the research is conducted (Eisenhardt, 1989; Isabella, 1990).

The qualitative analysis was held in four cases from innovative Brazilian companies, and the data were analyzed individually and comparatively. The use of multiple case studies can bring rich, empirical descriptions of a particular instance of a phenomenon based on a variety of data sources of recent events. Thus, the cases are the basis for the development of inductive theory, as theory emerges from the recognition of the existing patterns between the constructs within and across cases. Therefore, each case is considered a unique experiment, assuring the replication logic of theory building (Eisenhardt & Graebner, 2007). The detailed methodology of the qualitative analysis is presented in Section 4.2.

The research outcomes were continuously presented to the Innovation Management Lab research group, *Laboratório de Gestão da Inovação* (LGI), and independent investigators, who provided different perspectives, strengthening the theory. The convergence of observations from multiple investigators conferred triangulation of the research investigation and data (Eisenhardt, 1989).

4.2 QUALITATIVE ANALYSIS

The qualitative analysis aimed to deepen the understanding of the HRM system and practices focused on strategic innovation employees in established innovative Brazilian companies. Accordingly, the neo-positivist, configurational comparative, inductive approach, theory building from cases was used since it pursues rigor in qualitative methods (Eisenhardt, 1989).

Pilot interviews were conducted with four HR specialists, HR professors from FEA- USP, and two HR consultants to acknowledge the subject's key concepts and verify the research project's consistency with the HRM literature state of the art.

The interviews were conducted with HR experts as a pre-test to determine the state of the art of what is currently done in established companies concerning HRM practices aimed at managers and executives in general and specifically for those who work with innovation. Then, the interviews with HR and innovation managers of established innovative companies aim to verify which specific HRM practices were used for strategic innovation managers and directors and to perceive if there is something different for managers and executives that work with long-term and highly uncertain innovation projects. The pre-test validated the research protocol and captured possible interesting cases.

The research protocol intended to describe the procedures to be followed in each interview, it contains the questionnaire to be used in the interviews, the data collection instrument, along with procedures to use it (Guerra, 2010). The research protocol was continually refined during the research project, as it was a highly iterative process that compared theory and data (Eisenhardt, 1989).

4.2.1 Studied variables

As emerged from the literature, the variables to be studied are strategic innovation, strategic innovation roles, talent management, HRM practices, evaluation, rewards, and development for strategic innovation, as presented in Figure 4.

The unit of analysis of the cases is the company's HRM system. Examining different HRM systems and practices allows the conduction of comparative analysis,

even within the same company, enabling a deeper understanding of their effectiveness and impact on strategic innovation development.

4.2.2 Sample selection and size

The chosen methodology, theory building from cases, requires the use of theoretical sampling, as its objectives focus on the development of in-depth insights about the phenomenon, using multiple cases in an attempt to reach generalization (Eisenhardt & Graebner, 2007).

The selection criteria of the cases was established companies that develop strategic innovations internally in Brazil, that is, organizations with defined structure and processes for the systematic development of long-term, highly uncertain projects and opportunities. A theoretical sampling of cases is appropriate to theory development, as the selected cases hold particularities that are critical to the evidence of the logic between constructs, illuminating the relationship among constructs (Eisenhardt & Graebner, 2007).

A multiple-case approach was selected to expand the exploration possibilities of the research questions. Besides, the possibility of comparison can clarify the replicability of theory, hindering the possibility of idiosyncratic findings (Eisenhardt & Graebner, 2007). Therefore, as for Eisenhardt (1989), the ideal sample size is from four to ten cases. When there are less than four cases, but there are several mini-cases within, theory generation's complexity and its empirical grounding will not be hampered. More than 20 organizations from different industry sectors were considered. However, representatives of only six companies declared to develop innovations beyond incremental. These were approached for conducting exploratory interviews for requirements' case validation and deepening of the study, as shown in Table 6.

The scarcity of Brazilian companies engaging in internal strategic innovation, coupled with challenges in reaching their executives and HRM personnel, who displayed reluctance to participate in the research project, hindered the availability of suitable cases for the research project to reach data saturation, as recommended by Eisenhardt (1989) to achieve a comprehensive and representative data collection of

the phenomenon. Thus, the current research thesis aims at an exploratory investigation approach without harboring aspirations to attain a definitive theory.

Three organizations that systematically developed strategic innovation were identified and selected for data collection, but one company chose to discontinue its participation in the research project for particular reasons. Thus, the pharmaceutical company and the transportation organization were accompanied in this study.

Table 6: Considered and selected cases.

Case	Innovation degree	Sector	Number of meetings	Data collection time (min)	Note
Pilot interviews	-	HRM	4	185	
A1	Strategic	Pharmaceutical	13	1197	There was a change in the structure and the HRM system
A2	Strategic				
B1	Strategic	Transportation	9	491	The company develops strategic innovation in two business units
B2	Strategic				
C	Strategic	Chemical	2	360	Canceled for external reasons
D	Incremental	Chemical	1	75	Not selected
E	Incremental	Auto parts	1	35	Not selected
F	Incremental	Electrical devices	1	55	Not selected

Source: designed by the author.

During the data collection of the pharmaceutical company, it was reported by the interviewees that significant changes were foreseen in the HRM system for the following years. Thus, a new data collection phase was programmed for after the implementation and consolidation of such changes. In the second phase of data collection, in addition to the changes in the HRM system, there was a change in the structure of the pharmaceutical company. Thus, two mini-cases were derived from this company to compare and analyze HRM systems and structures.

In the transportation company, it was identified that there were strategic innovation roles and positions in two distinct areas of the organization, in which different parts of the strategic innovation management and development were

performed and presented contrasting HRM processes and practices. Hence, the aspects related to HRM and strategic innovation for each of these areas of the organization were analyzed individually as mini-cases.

4.2.3 Selected companies and cases

Organizations that met the selection criteria: established companies intentionally developing strategic innovation internally in Brazil were selected. It was expected that the selected cases presented formalized managing procedures and structures (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017), legitimate strategic innovation roles and positions (O'Connor et al., 2018) and TMT's formal and direct involvement and support (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016).

The following sections present an overview of the selected organizations and their corresponding cases.

4.2.3.1 Pharmaceutical company

The pharmaceutical company is a national organization that has been operating for more than 50 years in the market. One of the five largest companies in the sector in Brazil, based on the Pharmacy Purchase Price methodology, it was awarded as one of the Brazilian most innovative companies systematically since 2015 by Prêmio Valor Inovação. The organization employs 5.000 people through five industrial plants in Brazil. Its products are licensed in over 20 Latin America, Africa, Asia, and Europe countries.

The pharmaceutical company first nurtured its strategic innovation capabilities by creating a phytotherapics' R&D area in 1989 to develop what came to be the first drug thoroughly researched and developed in Brazil. Based on Brazilian biodiversity and popular knowledge, this medicine was an opportunity identified and defended by one of the company's founders, launched seven years later as its first strategic innovation.

The organization experienced significant growth in the last decade based on its successful incremental innovation system outcomes. In 2015, the pharmaceutical company created an innovation area, which included a center for incremental innovation and another for strategic innovation, intending to develop strategic innovation systematically. In addition, it has partnerships with scientific and technological institutes and private firms to discover new biological targets and pharmaceutical assets.

The strategic innovation unit director and managers were approached at an event about innovation by the end of 2016, where the organization was invited to be part of this research project, and one of the companies accompanied by the LGI and its researchers on strategic innovation in established companies. A first meeting was held at the pharmaceutical company's headquarters, in August 2017, with the participation of the strategic innovation director, innovation managers A1, A3, and A5, as well as the LGI's coordinator, Professor Mario Sergio Salerno, and the researchers Pryscilla Aparecida Vaz de Oliveira, Vinícius Chagas Brasil, Rafael Augusto Seixas Reis de Paula and Frederico César de Vasconcelos Gomes, in which the partnership, involving a non-disclosure agreement, in which the pharmaceutical company agreed to collaborate with LGI's researches, and LGI would provide three workshops about strategic innovation management, portfolio and people management for the company's innovation unit.

During the pharmaceutical company's visits and interviews in 2018, some interviewees observed that the HRM system was about to change. Therefore, in 2021, to capture the new HRM system and the changes performed, an interview was conducted with Innovation Manager A1, and recent documents were gathered. In addition, Innovation Analyst A1, who was also a new LGI researcher, presented the organization's strategic innovation unit in a LGI meeting. Accordingly, the pharmaceutical company consist of two mini cases, Case A1 and Case A2, which served as a means of comparison in the analysis.

Case A1 focused on developing novel pharmaceutical products, spanning from the initial discovery stage to the pre-clinical phases. This endeavor was driven by pre-defined strategic innovation objectives, specifically targeting unmet market needs and the development of cutting-edge technologies. The projects undertaken by Case A1 were characterized by their long-term nature, requiring specialized expertise.

Building upon the foundation laid in Case A1, Case A2 witnessed structural and strategical changes while maintained the continuity of the Strategic Innovation Unit. Moreover, the evaluation system underwent a reshaping process.

4.2.3.2 Transportation company

The transportation company is a national company that has been operating for more than 50 years in the market. One of the largest companies in the sector in the world in one of its product lines, it was awarded as one of the Brazilian most innovative companies systematically since 2015 by *Prêmio Valor Inovação*. The organization employs over 20.000 people distributed among its units in the American, African, Asian, and European continents.

The company was born from the development of a strategic innovation project that, in the eyes of a group of visionaries and champions, could be produced and commercialized in Brazil, becoming one of the most respected national companies. Although the transportation company developed innovative solutions from the beginning of its activities, it started to implement a strategic innovation management system in 2011.

The enterprise was suggested by Expert C as having a differentiated HRM system for the engineering function, in addition to being accompanied by the LGI for several periods. Given some difficulties obtaining responses from some possible interviewees indicated by the LGI connections, alternative contacts, with suggestions that they worked with strategic innovation in their online CVs, were sought and contacted through LinkedIn. This alternative approach enabled the identification of employees who worked with strategic innovation outside the Strategic Innovation Unit, who might not be seen as interesting for LGI research due to unrevealed biases. The existence of two structures encompassing positions dedicated to strategic innovation that held different HRM systems evidenced the possibility of designing two mini-cases for the transportation company.

The organization develops strategic innovation in a differentiated way in two business units, separated here as Cases B1 and B2. Case B1 presents the Technological Area’s work with strategic innovation development and how the HRM system is aimed at its employees. While Case B2 describes the orchestrating work of

the Strategic Innovation Unit, its main projects and stimulus programs for strategic innovation, and the HRM system geared towards it, which sets it apart from the rest of the company. As the cases are part of the same organization, part of the data is common to Cases B1 and B2. To clarify the delimitation of each case and for a further understanding of the enterprise's strategic innovation and HRM, the analysis of these data will be presented prior to Cases B1 and B2.

4.2.4 Data collection

The primary source of data collection of this research is the semi-structured interviews, as they have always been essential for qualitative research methods in management studies (Langley & Meziani, 2020), enabling the capture of rich, empirical data (Eisenhardt & Graebner, 2007), the detailing of the meetings of each case can be seen on Table 7. However, documents, archives, and observations are also important sources to compose the data since multiple data collection methods enable triangulation (Eisenhardt, 1989). The official documents of the cases used as data sources refer to the annual reports of the pharmaceutical company between the years 2017 and 2021 and of the transport company from 2021, besides their websites.

Table 7: Details of data collection meetings.

Case	Date	Communication platform	Participants	Position	Area	Duration (min)
Pilot interviews	July 12th, 2017	On-site, FEA	Expert A	HR professor	PROGEP professor from FEA - USP	45
	July 28th, 2017	Remote, Skype	Expert B	HR consultant	HR consultant	30
	July 31st, 2017	On-site, FEA	Expert C	HR consultant and professor	HR consultant and PROGEP professor from FEA - USP	45
	October 9th, 2017	On-site, the consultancy firm	Expert D	Director	Strategy, culture, and leadership consultant	65
Case A1	April 9th, 2012	On-site, the company's headquarters	R&D Manager A1	R&D manager	R&D area	150
	August 17th, 2017	On-site, the company's headquarters	Innovation Director A2 and Innovation Managers A1, A3 and A5	Strategic innovation leaders	Strategic Innovation Unit	120
	March 23th, 2018	On-site Strategic Innovation Workshop, the company's headquarters	Innovation Managers and strategic innovation employees	Strategic innovation employees	Innovation Unit	180
	April 19th, 2018	Remote, Zoom	Innovation Manager A1	Synthesis Lab Coordinator	Strategic Innovation Unit	40
	May 3rd, 2018	Remote, Zoom	Innovation Manager A2	Early Development Manager	Strategic Innovation Unit	60
	May 4th, 2018	Remote, Zoom	Innovation Manager A3	Strategic innovation manager	Strategic Innovation Unit	30

Continue

Case	Date	Communication platform	Participants	Position	Area	Duration (min)
Case A1	May 9th, 2018	Remote, Zoom	Innovation Manager A5	Strategic innovation manager	Strategic Innovation Unit	30
	August 24th, 2018	On-site Strategic Innovation Portfolio Workshop, the company's headquarters	Innovation managers and strategic innovation employees	Strategic innovation employees	Innovation Unit	180
	September 6th, 2018	Remote, phone call	HR Manager A1	Business Partner	HRM	45
	February 15th, 2019	On-site HRM for Strategic Innovation Workshop, the company's headquarters	Innovation managers and strategic innovation employees and HR manager	Strategic innovation employees	Innovation Unit	180
Case A2	July 23th, 2020	Remote, Teams	Innovation Manager A1	Synthesis Lab coordinator	Strategic Innovation Unit	62
	November 14th, 2021	Remote, Zoom Innovation Analyst A1 presentation	Innovation Analyst A1	Strategic innovation analyst	Strategic Innovation Unit	60
Case B1	April 8th, 2022	Remote, Zoom	Innovation Specialist B1	R&T Strategy Engineer and Future Analysis	Technological Area	56
	May 3th, 2022	Remote, Meets	Innovation Specialist B2	Chief R&T Advisor	Technological Area	57
	May 13th, 2022	Remote, Meets	Innovation Specialist B1	R&T Strategy Engineer and Future Analysis	Technological Area	65

Continuation

Case	Date	Communication platform	Participants	Position	Area	Duration (min)
Case B2	May 26th, 2021	Remote, Teams	HR Manager B1 and HRBP B1	Global Compensation & Benefits Planning and HRBP	People and Sustainability Unit	57
	May 3th, 2022	Remote, Meets Innovation Manager B1 presentation	Innovation Manager B1	Innovation and Digital Transformation Senior Manager	Strategic Innovation Unit	55
	May 9th, 2022	Remote, Zoom	Innovation Analyst B1	Innovation Strategy and Corporate Venture Capital Analyst	Strategic Innovation Unit	67
	May 18th, 2022	Remote, Meets	Innovation Director B1	Innovation Executive and Head of Startup B2	Strategic Innovation Unit	30
	May 18th, 2022	Remote, Meets	HR Manager B2	Head of HR of Startup B2	Strategic Innovation Unit	60
	May 20th, 2022	Remote, Meets	Innovation Manager B2	Market intelligence leader of Startup B1	Strategic Innovation Unit	44
Case C	October 11th, 2017	On-site, the company's headquarters	Innovation Managers C1 and C2	Innovation management coordinators	Strategic Innovation Unit	180
	November 7th, 2017	On-site, the company's headquarters	Innovation Manager C1	Innovation specialist	Strategic Innovation Unit	180

Continuation

Case	Date	Communication platform	Participants	Position	Area	Duration (min)
Case D	May 6th, 2022	Remote, Zoom	Innovation Manager D1 and D2	Innovation management and open innovation manager and Development & innovation lab manager	Innovation Unit	75
Case E	May 17th, 2022	Remote, Zoom	Innovation Director E1	Technological innovation management manager	Innovation Unit	35
Case F	July 7th, 2022	Remote, Zoom	Innovation Manager F1	New business development	Innovation Unit	55
					Total time of data collection	**2398**

Conclusion
Source: designed by the author.

Information about the organizational structure of companies was necessary to locate the position of strategic innovation function and its HRM practices to answer the research questions. The first could be obtained through documents provided by the firm (website and interviewees). The questionnaire also addressed this topic indirectly. The assessment, rewards, and development practices were considered in this research as events that happen periodically in the organization. Therefore, the interviews consist of the investigative genre, as characterized by (Langley & Meziani, 2020).

The interview on a qualitative study is an interactive and cooperative process directed the interviewer and interviewee to a defined purpose, the knowledge creation (Fraser & Gondim, 2004). The advantage of the interview is to favor the subjective relation between interviewer and interviewee; the flexibilization of the research process and data analysis, and the triangulation of the data, given that the researcher can support her conclusions by probing the research protocol. The interviews were guided by the research protocol presented in Appendix B.

The investigative genre of interview was considered neo positivist, that is, it assumed there is an objective truth and information about it can be captured from respondents who witness what happened, as it is not possible to observe these events as they happen in each case (Langley & Meziani, 2020).

The interviews were semi-structured and could be made in person, through telephone, Skype, Zoom Meetings, Google Meets, or another digital platform and recorded when consented. Notes were used to gather observations of the firm and interview, as a conversation always involves subjectivity and can be entailed in political issues that may be detected by the interviewer (Langley & Meziani, 2020). If the company or the interviewee considered it necessary, the researcher signed a non-disclosure agreement.

The constructs strategic, radical, breakthrough, or disruptive innovation were until the last part of the interview to avoid bias in the answer of the other questions by the use of non-directive questioning (Langley & Meziani, 2020). Also, explicit examples could be asked when the interviewee gives vague answers or generalities (Langley & Meziani, 2020). Another strategy to limit bias was the use of numerous and highly knowledgeable informants from different functional areas, who view the phenomena from different perspectives, including qualified actors from other relevant organizations

and outside observers (Eisenhardt & Graebner, 2007) to build a unified description of the facts (Langley & Meziani, 2020). The data collection focused on interviewing employees working with strategic innovation project management from different roles, positions, and hierarchical levels, in addition to HR managers and business partners (BP) who were also involved with strategic innovation initiatives continuously or temporarily. At the end of the interview, the interviewee was asked to indicate other colleagues who could collaborate with a better understanding of the studied subject in order to interview as many individuals as possible (O'Connor et al., 2018). In one of the cases, there was an indication of changes in the company's HR system. Thereupon, the case was resumed after a few years to capture such changes and provide novel insights.

The data analysis was overlapped with data collection to benefit from a flexible data collection to probe emerging subjects, new insights, and questions (Eisenhardt, 1989).

4.2.5 Data analysis

The data analysis followed the chosen methodology for the research, a multiple-case theory-building study (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). Each company was analyzed as a within-case, and groups of cases were created to help the cross-case analyses. The propositions were shaped inductively.

Initially, a detailed description of each case was made in the form of a within-case analysis that helped to deal with the large volume of data and its triangulation. Multiple investigators also analyzed the data forming an independent view to be added in the analysis (Eisenhardt, 1989). The within-case analysis procedure was based on the work of Eisenhardt (1989) and Isabella (1990), as the latter deals specifically with the qualitative analysis of semi-structured interviews. These approaches demand a constant comparison between data and theory.

The within-case analyses intend to bring the organization's understanding concerning human aspects of strategic innovation, possibilities of development and career building through innovation, how innovative roles are assessed and rewarded, and if there are implications as the ones found in the literature in the topic; the relation between the evaluation and incentive practices; and the legitimation of the strategic

innovation function according to the aspects studied. Each case was characterized by the maturity of the strategic innovation function and HRM system to adjust to their particularities.

The use of interviews with several employees of the same organization about the same fundamental aspects involving the company's systems is given by organizational members who have different perceptions and organizational roles and evaluate certain aspects emphasizing and highlighting different points of these processes, in addition to filling gaps left by other colleagues (Isabella, 1990).

Data were organized according to the constructs listed in the research protocol and preliminarily categorized as follows: lack of consistency of the rewards and evaluation system, strategic innovation managers dismissed or alienated careers, strategic innovation managers should have differentiated incentives and evaluation practices, rewards, and evaluation. These categories were continually modified as new evidence emerged, the complete coding evolution is presented in Appendix G. At the end of data tabulation, each interview report was systematically re-examined, looking for evidence that fit into the established categories. The coded categories and their relationships were examined in search of patterns and processes that could account for the frequency, strength, presence, or absence of some category (Isabella, 1990).

Once the within-case analysis was complete, the cases were be grouped by company and HRM practices. The cases placed in each group were juxtaposed to capture preliminary theoretical relationships between them, using the replication logic, considering each organization a case (Eisenhardt, 1989).

Then, a general cross-case analysis was made towards other theoretical relationships and constructs that could explain the data more consistently than the previous theory that emerged, relying on tables and graphs to refine it, following, again, the replication logic (Eisenhardt, 1989).

Finally, the theory built was related and conflicted with the literature background for theoretical logic refinement. Related studies can reveal theoretical contributions, while conflicting ones can bring arguments and evidence that reinforce emerging propositions (Eisenhardt, 1989).

5. PILOT INTERVIEWS

The pilot interviews aimed to acknowledge the main HRM concepts and constructs related to the challenges identified by innovation management, verify the consistency of the research project with the state of the art of HRM literature, validate the initial research protocol, and identify possible exemplary cases of Brazilian companies applying HRM for strategic innovation.

The choice of HR specialists considered that they could bring different points of view to the research project. Expert A graduated in Economics with a master's degree in the same area and a Ph.D. in Administration. He is a professor in the PROGEP from FEA – USP, where he researches HRM models, the labor market, and labor relations. Expert B graduated in Psychology with a specialization in Philosophy. He has owned an HR consultancy company since 1986, specialized in the development of people and organizations. Expert C holds graduate, master, and PhD degrees in Administration. He is a professor in the PROGEP from FEA – USP, where he researches competence management, career, people management, and leadership development. He also is a founding partner of an HR consultancy company since 1989. Expert D holds graduate, master, and Ph.D. degrees in Production Engineering. The subject of his Ph.D. thesis was financial rewards for innovation. He has acted in the business management, human capital management, and organizational development areas for more than 20 years. At the time the interview was conducted, he was a director of projects and operations in an HR consultancy company specialized in strategy, culture, and leadership. By the end of this research thesis, he was part of the Executive Committee of a health solutions company, which integrates a multinational group in the services sector, in the Chief Human Resource Officer role.

The first pilot interview was with Expert A. It was an unstructured interview since its main objective was to obtain guidance about the research project subject and the HR literature. Expert A first highlighted the use of the word "career" in the presentation of the research project, as the studies using this construct currently are focused on the concepts of careers without borders and protean careers, in which the individuals are the masters of their careers and not the company. Similarly, he highlighted that a career in innovation is governed by individuals since its labor market has a scarce body of workers based on intensive activity in knowledge.

From an organizational point of view, there is a need to retain these individuals in the company, and therefore, HRM practices are used in established companies. He mentioned that people management is ruled by development, reward, and movement. According to Expert A, development is related to training and assessment, reward to incentive, and movement to promotions. The development results make it possible to obtain rewards and the relationship between development and reward to movement.

After a brief presentation of the research project's scope, Experts B, C, and D underwent semi-structured interviews using the questionnaire developed for HR consultants. The questions at this point of the project's development addressed the guiding factors when choosing new CEOs in large companies; HR systems aimed for managers and executives: assessment, metrics, frequency, performance, rewards, and the relationship between these practices; and if there was any difference in the evaluation of strategic innovation managers and executives.

5.1 Selection of new CEO

The president or CEO position requires, in general, strategic vision, systemic vision, market knowledge, good interlocution with stakeholders, conditions to leverage the business and capacity to make internal transformations, leadership capacity, and good interpersonal relationships, which are the nature of the CEO's chair. Choosing a new CEO depends on the individual's background and the organization's business context. In addition, Expert B mentioned the financial agreement issue to be closed between the organization and the new CEO.

According to Expert C, technology-based or innovative companies usually prioritize those with experience in this area. In a consumer goods company, there is a tendency for the CEO to have good experience in marketing, product, and brand management, but not necessarily in the commercial area. Organizations undergoing profitability, sales, acquisitions, or mergers usually prioritize a person with a financial background.

Expert B highlighted the differences between external and internal recruitment. In the internal recruitment of large companies, the individual's trajectory is mentored to develop and expand specific capacities, such as systemic view and business functioning comprehension through the allocation in several areas, for example. Some

organizations monitor one or two individuals who are prepared, and sometimes expatriates in the case of multinationals, to assume the chair of CEO in the future. In external recruitment, the individuals' reputation within the market and the companies they acted in are evaluated. The board of directors' choice is guided by the individual's ability to perform the desired transformations, meet the requirements defined by the company, and possess the expected competencies.

However, Expert D warns that frequent CEO changes can be chaotic to the organizational agenda. When this occurs, there are also changes in key executive positions. This process is slow. The boards change over time, and when some stability is reached, the CEO changes again. Such change generates inevitable anguish throughout the organization.

The experts' statements are in line with the literature's assumptions that suggest the need for CEOs to have varied functional experiences and competencies (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014); and that selecting CEOs with expertise in the area in innovative firms (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017). Although this did not prove to be a general reality in the results of the CEOs' analysis, discussed in Session 5.1, even among the technology-based firms of the investigation.

5.2 HRM systems aimed for managers and executives

The HRM systems for managerial and executive positions must consider the existence of two important political arenas at the tactical and strategic levels. Expert C believes that, in most companies, there is an oversight in this regard, as there is a tendency to put a person who is a good technician in the tactical management position. A managerial role differs from a leadership role. In technical leadership, the person is performing technical guidance. In contrast, a management position requires managing scarce resources, such as money, space, and technological resources. Therefore, when becoming a manager, the individual enters a political arena.

Expert C stresses that it is not uncommon to absorb people into managerial positions for political reasons rather than managing capacity, which is a serious challenge in Brazil. People unqualified to act in the political arena cannot fully assume

a managerial position, as they are not able to negotiate or understand the business or lack a systemic view of the organization, which triggers many problems.

In technology companies, at the tactical level, the person must have technical legitimacy to reach a managerial level. There is confusion about putting a person who is good technically but not managerially. The challenge is to identify, among the good technicians, that person who also has a vocation for the political arena. Identifying these people is essential because it can generate personal dissatisfaction when moving to a managerial position, as s/he will no longer be doing what s/he likes, but managing those who do this work and the adaptation time to the position can be long.

Expert D takes this discussion from the leadership perspective. Currently, companies have focused on leadership. In addition to acting as a manager, the leader's role is to inspire and make people follow a specific purpose or path. Expert D believes that companies are focusing on leadership because the management's tools are already solving deliveries, deadlines, and schedules, for example. Hence, these became a sine qua non condition for managers of large companies. Managerial positions require managing and leading people, besides the technical aspects. While people management can be complex, he believes leadership is more challenging, as it is not intuitive. Managing people is not trivial, as it includes, for example, rewards management which, despite being modeled by HRM, managers are trained to put this model into practice.

Managers need to be well-trained to reach this level of leadership, which is why companies use leadership development programs. In 20 years, companies have moved from providing management development programs to leader development programs. This change becomes even more important as values are changing. In the past, people were loyal to the company. Today there is no longer a bond with the organization, and people easily switch companies for better opportunities. The leader is essential in creating this bond between person and organization. Otherwise, the resulting high turnover becomes very costly for the company.

These programs aim to develop these leaders, increase their leadership management capacity, and align incentives so that leaders and subordinates go in the same direction as the company, which is very difficult in Brazil. Here, people generally have a contradictory vision of firms; they want to change companies frequently and also an organization that provides them with development, retirement, and career. This

inconsistency challenges the alignment of incentives. Currently, they are based more on meritocratic concepts and less on company seniority, as was strong in the past.

Expert D believes that evaluation and reward systems aim to give something, such as a bonus or a promotion, in exchange for the company's desired results. Thus, the HRM is constantly pressured by shareholders, management, and the workforce, which have different objectives and priorities. Balancing these factors to achieve this alignment is a great HRM challenge. The HR creates a model and passes the tools to the manager, who needs to apply it in practice. However, the efficiency of these tools and the dissipated energy is hard to determine.

5.3 Evaluation system

First, a performance evaluation plan is made for a pre-established period. In Brazil, it is usually the calendar year, explains Expert D. This performance appraisal plan sometimes sets goals for leaders, executives, and eventually all workers. The goals are a cascade of the organization's objectives. If the goal is to innovate more, then there must be goals for innovation, not for everyone, but for a good part of the organization. If the goal is aggressive growth, the goals must be aligned with that objective.

Expert B asserts that managers and executives are evaluated in a type of evaluation called integrated, quantitatively and qualitatively, in the same way as other employees. Quantitative assessment is usually linked to variable compensation and qualitative to promotions or eligibility. Some of these managers and executives are monitored and prepared to occupy strategic positions in the future. Quantitative assessment is based on concrete deliverables, such as goals. These targets are usually performance metrics related to budget, volume, and revenues. Project success is also related to quantitative goals; metrics such as budget, schedule, and other project benchmarks are considered. The quantitative evaluation is integrated into a qualitative assessment based on competencies that analyze how the goals were achieved. Competencies are previously defined through a specific methodology in which the company defines the desired competencies for management and leadership positions. Competences can be, for example, customer focus, leadership, interpersonal relationships, team building, focus on results, and systemic vision. The

leader is evaluated from this dual point of view, which is monitored by the individual's direct superior.

Expert D claims that the performance evaluation model varies significantly from one company to another. However, there is a trend toward adopting more quantitative metrics or goals that depart from subjectivity. There is an attempt to reduce the subjectivity of the process. Then, the established goals can be monitored over time, or the results can be calculated at the end of the period to verify if the employees have reached their goals. As a general rule, there are incentives associated with these targets. One of the areas where it is easier to relate assessment results to rewards is sales. Defining goals is much more difficult for internal areas such as marketing, HRM, and even the financial area. Taking the financial area as an example, it is responsible for consolidating the data and making reports, but it is not responsible for the financial result.

Expert C brings the logic behind the assessment practice. Managers and executives are evaluated in four dimensions: development, results, behavior, and potential. The first is the person's level of development, which is measured by their assignments' complexity level. Managers have a perception or expectation of the performance of their subordinates based on their responsiveness. Thus, managers will develop those who face more demanding challenges with ease. The second is results, also called goal attainment. Some people manage to generate results even in adverse situations, which do not prevent them from reaching their goals. In addition to the goal, it is considered what was around its achievement. The third is the most attitudinal behavior, in which three aspects are observed: the organization's values, interpersonal relationships, and attitude towards work, that is, the person's level of commitment. The fourth dimension is potential, which is less intuitive than the previous ones. The potential is when people show a noticeable evolution in the company, and the organization perceives their possibility to assume more complex assignments systematically.

Managers who have achieved good performance have met or exceeded the quantitative and qualitative goals, that is, the complete set of performance, results, and behavior. This is the common ground. Hence, serious companies look for individuals who deliver and do it properly.

However, Expert D considers that there are other relevant factors. Although succession seemed to be a trending topic, there were no targets for it. However, the absence of a successor for a management position implies the limitation of the person occupying that position. For a manager to be promoted, there must be a vacancy, to be prepared for a more complex role, and, most importantly, to have a successor for the current position. For him, mainly in multinationals, as much or even more important than delivering was marketing what has been done, giving visibility to the performed work.

According to Expert D, the definition of goals for evaluating managers and executives depends on what the company expects and the function of the area. As a rule, in large companies, the targets are defined based on a financial indicator. Most start from an EBITDA margin (Earnings Before Interest, Taxes, Depreciation, and Amortization), an EVA (Economic Value Added), or the company's growth. Then, a breakdown of how these indicators can be achieved, that is, how each area contributes to this business objective.

Indicators for evaluating one's potential are hard to determine, according to Expert C. Some organizations use specialized services called assessment, in which the consultancy evaluates the level of complexity the person can handle, analyze the biography, and speed of growth to project the ascension line. This assessment can also calculate the person's learning speed for development. However, most organizations use observational criteria, for example, the person's ability to operate in another level of complexity to deal with pressure, investments in their self-development, and growth continuity.

The frequency of the evaluation is usually annual. Nevertheless, according to Expert B, it may depend on how the evaluation is carried out in the company; the period the manager has to perform may be longer. For example, when evaluation is carried out consistently by evaluation committees, or when the company carries out the evaluation in two periods, one year can be for development and the other year for evaluation. Quantitative targets are usually annual due to the end of the fiscal year, as it impacts variable compensation. Nonetheless, Expert D pointed out that some organizations do mid-year reviews, as the complexity and number of changes along the year are significant, and the review of goals is expected to check if they are still valid halfway through.

Expert D highlighted some common challenges as a final point on assessment in established firms since it requires much discipline to be conducted appropriately. It is common to find companies that do not have good practices, either because the company's objectives are not aligned with the employees' goals, or there were changes in the path. Many large companies close their goals late, between March and April or even in June, and, as the target is annual, their employees spend almost half of the year without knowing what they must achieve by the end of the year. In addition, there are poorly formulated goals that, when closing the results, it is difficult to determine whether the goal has been achieved or the result depends on subjectivity.

5.4 Reward system

The most common rewards aimed at managers and executives vary significantly from company to company, but they usually are variable remuneration, such as profit sharing, bonuses, and promotions. Experts C and D stated that, usually, variable compensation becomes an essential part of the reward system as an individual approaches an executive level rather than at operational levels.

Intrinsic incentives, for Expert C, depend on the organization's culture, which stimulates, values, and continually challenges people. However, it may not necessarily impact functions of greater complexity that naturally have these attributes. Another critical factor is having a positive perception of the organization regarding its good reputation and solid values, which bring pride in belonging to it and have become increasingly important worldwide.

In addition to the HRM area dedicated to rewards and benefits, managers also have some autonomy to grant intangible rewards. Expert D appointed the improvement of the benefits package, granting training, and being eligible to have company sponsorship in MBAs or postgraduate courses as intrinsic rewards, also giving exposure and visibility to an individual, such as bringing the person to a board meeting or posting their project as a case study on the corporate intranet. Many organizations organize an annual award event, of which the main incentive is the recognition of receiving the award from the CEO's hands. In addition, there is positive feedback, which tends to be overlooked but is valued at an individual level.

People have different drivers; for some, it is money; for others, status argued Expert D. The leader needs to have a package of different forms of incentives able to suit different people in different ways, associated with giving opportunities with greater visibility, that can bring competitiveness for the individual. For example, an information technology developer may see a promotion to a management position as a problem. While for very technical areas, recognition may come from a specialist career.

The qualitative assessment affects fixed remuneration, such as a promotion, increasing responsibilities, and salary, according to Expert D. Reaching more strategic positions is linked to the concession of differentiated benefits. More meritocratic HRM systems stipulate that a merit increase can be in the same salary range when the position remains the same, but there is an increase in the salary value. While in a promotion raise, the person moves to a position of greater seniority than the current one.

The result of the quantitative assessment impacts variable compensation, in which each company has its own system, and there are cases where the variable remuneration is based on legislation, such as profit sharing. Expert D exemplifies that there are organizations where the bonus is a salary per year, while in others, the bonus can reach 15 or 20 salaries per year. The magnitudes can vary significantly, but in any case, there is always a rule that stipulates the distribution of money. Experts B and C reported that these results might be related to the area, intermediate goals, and in cases of organizations with several synergic businesses, it is common that these areas are stimulated in terms of collective results, aiming to stimulate a more collaborative posture between the business units. For Expert D, the annual bonus may be the most sought-after among executives. However, Expert C pinpointed that some executives demand differentiated benefits, mainly concerning their security, such as guaranteeing their children’s education in case of their absence and the family’s safety.

The relationship between project success and rewards is a more delicate issue, according to Expert C. When the project lasts less than one year, it is possible to establish an incentive in terms of project cost and meeting deadlines. However, for longer projects, and some may be equivalent to a medium-sized company, it is not possible to establish these indicators. In such cases, indicators may be intermediate targets related to the project’s budget or customer satisfaction with intermediate deliverables.

Yet, Expert C argued that some projects are impossible to measure in terms of results, as they are developed based on a sense from a future market. In the transportation company, which he indicated as a case of this research, there were positions with director and vice-president (VP) status involved in confidential future projects. Several of these projects were canceled when they were not economically sustainable. The project's indicators in these cases, which often happen in technology-based companies, were more technical and closely linked to an organization's policy of allocating part of the company's revenue to the R&D area. Thus, it was assumed that a body of technicians would be maintained and that fantastic outcomes were expected, as well as a significant number of flawed projects.

The evaluation of managers who have been involved in canceled projects, as stated by Expert D, is one of the biggest challenges encountered among his consultancy clients, which are large companies with huge revenues. In most of these companies, mistakes are punished, despite a fail-fast discourse, or flaws are a learning opportunity, as long as the person fails just once and quickly finds the flaw. As a rule, it involves the entire team. However, there is always someone responsible, usually from middle management, and even though it is not usual, the search for a culprit can protect people from the TMT that are closely linked to a project that failed. Ultimately, the market comes from decades of operational efficiency, lean production, and lean service pursues, in which an error equals waste. This mentality remains strong in organizations, while innovation involves trials, successes, and errors.

All Experts affirmed unaware of cases of differentiated evaluation and compensation for people who work in innovation.

6. QUANTITATIVE ANALYSES

The preliminary quantitative investigation sought to: acknowledge the main HRM concepts and constructs related to the challenges identified by innovation management and validate the research project with HRM experts; investigate the extent of this career risk perception and how it can be reduced; and validate the HRM practices brought by the literature.

6.1 THE MOST INNOVATIVE COMPANIES' CEOs

The quantitative study of the background of the CEOs from the most innovative companies intended to identify the existence of CEOs experienced in areas related to innovation in established companies and highlight the importance of such individuals in the TMT in innovative companies, to elucidate the need for HRM practices aimed at innovation talent retention.

6.1.1 Methodology

Hence, the career paths of 400 CEOs of firms listed as the most innovative in the world and 500 CEOs from companies awarded as the most innovative in Brazil from 2016 to 2020. Companies from the lists "The World's Most Innovative Companies" 2016, 2017, and 2018 from Forbes and "The Most Innovative Companies" 2019 and 2020 published by the Boston Consulting Group (BCG) were used To ascertain the background of CEOs from worldwide innovative organizations. To compare the career path of worldwide CEOs with the career path of local companies' CEOs and subsidiaries in an emerging country, Brazil, we investigated 500 CEOs of "Valor Inovação Brasil" from 2016 to 2020 from the Brazilian magazine Valor. Brazil was chosen to compare with the most innovative companies in the world as it is a developing country with an annual ranking similar to that carried out by Forbes (Forbes, 2018) and BCG (BCG, 2020).

The Forbes publication was chosen at the beginning of this study, in 2016, as being an internationally known ranking on innovative companies, having an explicit classification methodology disclosed, and including worldwide organizations. As these data were assessed longitudinally, along with the publication of the ranks, it was needed to adopt a different source to obtain the data from the world's most innovative

companies from 2019 on since Forbes stopped publishing its own list in that year and started to publicize BCG's rank. It is important to note that, in addition to the difference in methodology between the lists, the number of companies ranked by BCG was 50 companies, while Forbes used to publish 100 organizations every year. This difference in the number of companies in each rank indicates that a CEO classified as having an innovation background on the BCG list will have a more significant impact on that year's overall percentage than on the previous year's lists. BCG and Valor's lists were included in the study to present similar characteristics to the Forbes ranking, except for Valor's list focusing on Brazilian-based companies.

Forbes used the index "Innovation Premium" to rank the companies. The magazine explains the calculation of the index by "it is calculated first by projecting a company's income (cash flows, in this case) from its existing businesses and look at the net present value (NPV) of those cash flows. We compare this base value of the existing business with the current Enterprise Value (EV): Companies with an EV above the base value have an innovation premium built into their stock price" (Dyer & Gregersen, 2016).

BCG ranks companies based mainly on a survey of 2.500 global innovation executives. "We assess companies' performance on four dimensions and then take an average of normalized scores to calculate the overall ranking." The dimensions are (1) Global' Mindshare', "the number of votes received from all global innovation executives"; (2) Industry Peer View, "the number of votes received from executives in a company's own industry"; (3) Industry Disruption, "the Diversity Index (Herfindahl-Hirschman) of votes across industries"; (4) Value Creation, "the TSR including share buybacks from three years" (BCG, 2020).

Valor performs the rank along with the consultancy company Strategy&. Their methodology evaluates the companies qualitatively by the following criteria: intention to innovate, the effort to effectuate the innovation, obtained results, and market evaluation. The methodology emphasizes that the intention and innovation efforts must be primarily located in Brazil (Strategy&, 2020).

The information used from the lists was the company's name and, when provided, the CEO. After that, the career path of each CEO was searched on Google. From Forbes and BCG's list, the terms used in the search were "name of the CEO career" or "name of the CEO career company's name". Moreover, from Valor's list, the

terms “president company’s name” were used in the Portuguese language or “president company’s name Brazil” when it was a multinational company. The term “president” was used because it is more commonly used in Brazil than “CEO”. Most of the results produced a biography or profile of the person published on websites such as Bloomberg, LinkedIn, the company’s website, and business magazines’ announcements about the designation for CEO/president, including a profile of his/her career. From these profiles, it was verified if the CEO worked in areas classified as “innovation”; if not, it was taken as the last-named position under a specific area. Then, the CEO’s career background was assorted into the categories presented in Table 8. Figure 6 illustrates the search method used to assess the profile and data of the CEOs.

As the publications did not explore the company’s CEOs’ career, this information was obtained from other reliable sources such as Bloomberg, LinkedIn, the company’s website, and the announcement of the designation of the individual for the position in business magazines that included a career profile of the CEO.

The career profile of 80 CEOs (8.89% of the CEOs) could not be found at all, and these were classified as assorted. There were also cases of other famous homonyms in which the company’s name was used to narrow the target of the search. Additionally, some CEOs may have worked with innovation, but it did not appear in their profile.

To better understand how the career of CEOs with expertise in innovation occurs, the data of these CEOs were studied in more detail. As some companies were awarded in several years, in cases where the leader did not change, duplicate individuals were removed. CEOs with a detailed curriculum released on LinkedIn, Bloomberg, or the company’s website with positions and activity dates were selected. Then, it was analyzed whether the CEOs were experienced in other areas of activity besides innovation.

The start year of the first position and the end year of the last position related to innovation were taken to calculate the number of years of experience in innovation. Furthermore, the year of the beginning of the CEO performance of the listed company was collected to analyze the time from the first job in innovation to the CEO position.

From the profiles, it was taken the named positions under a specific area like marketing, operations, R&D, or sales, for example, on the current or previous

company, and classified according to the categories presented in Table 8 to determine the background of the CEO. When the CEO could be selected in two or more categories that were not classified as innovation, the most recent was considered. However, if the career of the CEO could not be found, it was classified as assorted.

In case the CEOs have a background in areas classified in this study as related to innovation (innovation, R&D, product, project or technology development, engineering), all the background areas' innovation-related roles they performed and time were also collected along with start and end dates for innovation-related positions and start date as CEO at the company.

The categories of CEOs were divided into the categories shown in Table 8. The search focused on the Innovation category; thus, it included research and development (R&D), product, project, and technology development and engineering.

Table 8: CEOs' categories and background areas.

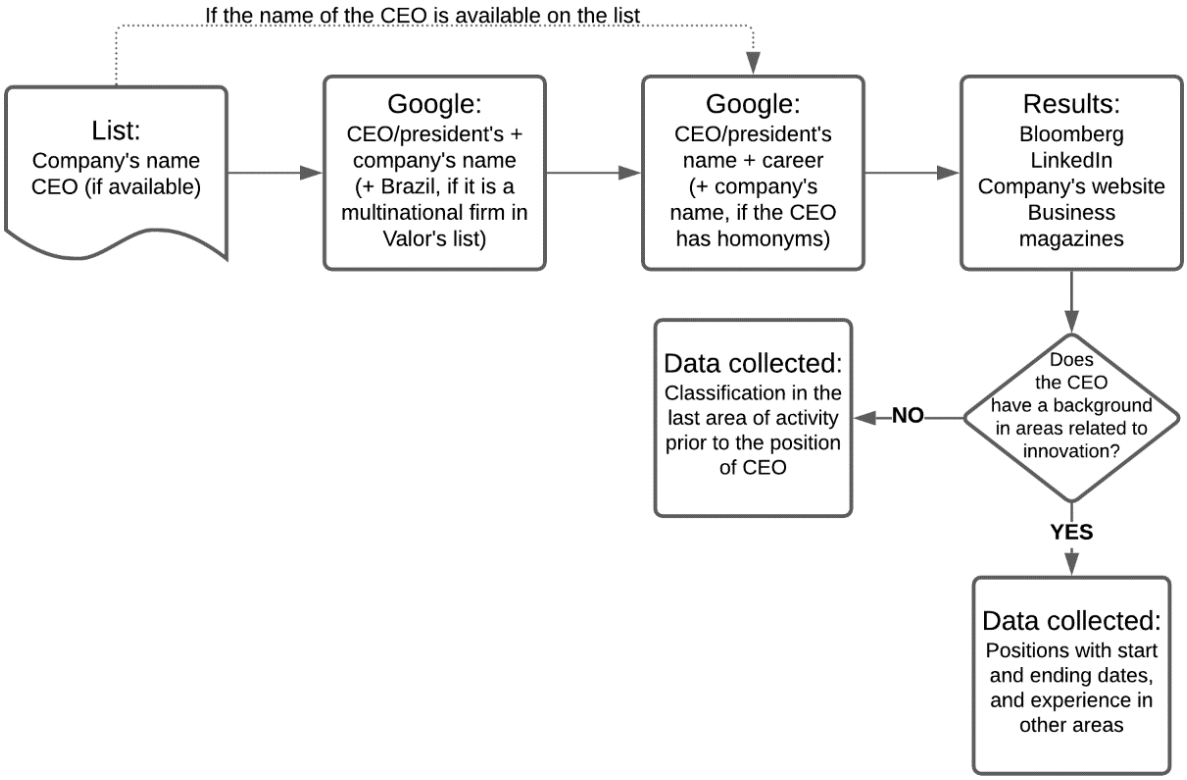
Category	Background areas
Assorted	The CEO's career could not be found.
Commercial	Commercial
	Marketing
	Sales
Consultancy	Consultancy
Entrepreneur	The CEO was the founder of the company
Family Business	The CEO was an heir of the company's founder
Financial	Financial
Health sector	Health sector
Human Resource	Human Resource
Innovation	Innovation
	R&D
	Product Development
	Project Development
	Technology Development
	Engineering
Legal Affairs	Legal Affairs
Operations	Operations
	Production
	Supply chain
Public Sector	The government named the CEO
Quality	Quality
Strategy	Strategy

Source: designed by the author.

As Table 8 shows, the category “innovation” is quite large. In pre-tests on the internet, it was virtually impossible to distinguish people with a background in strategic innovation. By adopting a large category, we are mixing all types of innovation, pure R&D, and engineering activities, not necessarily all dedicated to innovation. It implies that all the results encompass much more than strategic innovation. In other words, CEOs with strategic innovation backgrounds are a portion of those with a background in innovation. We will return to the argument when analyzing data.

The search was made right after the lists were published to precisely capture the CEO responsible for the company in the year of the issue.

Figure 6: Search method of the CEOs career from Forbes, BCG, and Valor’s list.



Source: designed by the author.

From Forbes and BCG’s lists, the results from Bloomberg and LinkedIn websites were preferred because of the reliability of the sources.

The *Valor*'s list search had as most reliable results LinkedIn and the announcement of the designation of the individuals for the CEO's position, including a profile of their career on business.

The availability of the profiles varied greatly; some could not have their career path found at all. There were also cases of other famous homonyms, in which cases the name of the company was used to narrow the target of the search. It is also possible that some of the CEOs had worked with innovation, but it did not appear in their profile.

It is possible that some of the CEOs had worked with innovation but it was not assigned in their profiles. Thus, it was considered only experiences publicized in the career profile.

To better understand how the career of CEOs with expertise in innovation occurs, the data of these CEOs were studied in more detail. As some companies appeared in the lists in several years, in case the leader did not change, duplicate individuals were removed and CEOs who had a detailed curriculum released on LinkedIn, Bloomberg, or the company's website with positions and activity dates were selected. Then, it was analyzed whether the CEOs had experience in other areas of activity besides innovation; to obtain the number of years of experience in innovation, the start year of the first position and end of the last position related to innovation were taken; and, to analyze the career distance between innovation and CEO positions, the year of the beginning of CEO performance of the listed company was collected.

6.1.2 Results

The previous experience of 900 CEOs of the most innovative companies in Brazil and the world was investigated over five years to verify whether innovation leaders had difficulty developing an executive career even in innovative companies. This examination showed that, on average, just 13,8% of the CEOs from Brazilian companies and 16% of CEOs from the global ranks had any prior innovation experience in the most innovative companies, as Table 9 displays.

The quantitative analyses of the Forbes, BCG, and Valor's lists presented that the CEOs' most relevant background areas were: operations, commercial, innovation, financial, and entrepreneur.

Table 9: Background of CEOs from innovative companies on average.

Classification	**World**	**Brazil**
Operations	25.4%	13.6%
Commercial	13.4%	25.0%
Innovation	**16.0%**	**13.8%**
Financial	9.4%	18.6%
Entrepreneur	16.4%	6.0%
Family Business	4.4%	6.4%
Strategy	2.8%	5.4%
Health Sector	0%	3.4%
Consultancy	1.6%	1.4%
Human Resource	1.2%	0.6%
Public Sector	0%	1.6%
Legal Affairs	1.0%	0.2%
Quality	0%	0.4%
Assorted	8.4%	3.6%

Source: designed by the author.

The detailed absolute results by year are shown in Table 10.

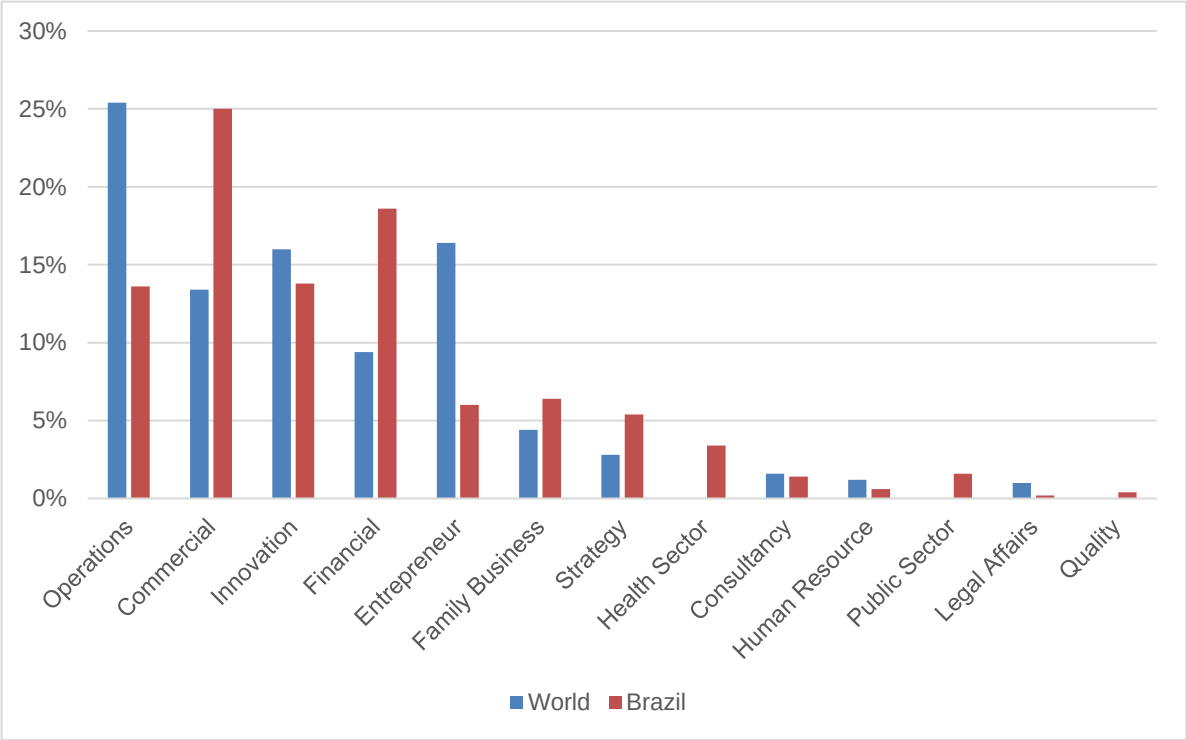
Table 10: Innovative company CEOs' backgrounds by year in absolute numbers.

	2016		2017		2018		2019		2020	
Classification	**World**	**Brazil**	**World**	**Brazil**	**World**	**Brazil**	**World**	**Brazil**	**World**	**Brazil**
Operations	22	9	25	14	20	15	17	17	13	13
Commercial	13	29	20	31	16	25	4	16	5	19
Innovation	**12**	**16**	**11**	**8**	**15**	**10**	**12**	**16**	**9**	**17**
Financial	11	16	6	18	10	16	4	20	6	23
Entrepreneur	16	7	15	6	15	6	7	5	11	5
Family Business	8	5	6	6	4	8	1	4	1	9
Strategy	1	5	4	6	3	7	2	4	1	5
Health Sector	0	1	0	4	0	3	0	4	0	3
Consultancy	0	4	1	1	5	1	0	1	1	0
Human Resource	0	0	0	2	2	1	1	0	1	0
Public Sector	0	2	0	2	0	0	0	1	0	0
Legal Affairs	3	0	1	0	1	1	0	0	0	0
Quality	0	1	0	1	0	0	0	0	0	0
Assorted	14	5	11	1	9	7	2	12	2	6
Total of CEOs	100	100	100	100	100	100	50	100	50	100

Source: designed by the author.

The relevance of the CEOs' backgrounds had a different weight in the world and Brazilian lists. In the Forbes and BCG lists, the predominant areas were operations, with 25.4% of the cases; entrepreneur, with 16.4%; innovation, with 16% of the CEOs; and the commercial area, with 13.4%. On the other hand, in the Brazilian list, the commercial and financial areas stood out with 25% and 18.6% of the cases, respectively, followed by innovation, with 13.8% of the CEOs, and operations, with 13.6%, as shown in Figure 7.

Figure 7: Innovative companies' CEOs' backgrounds in the world vs. Brazilian lists.



Source: designed by the author.

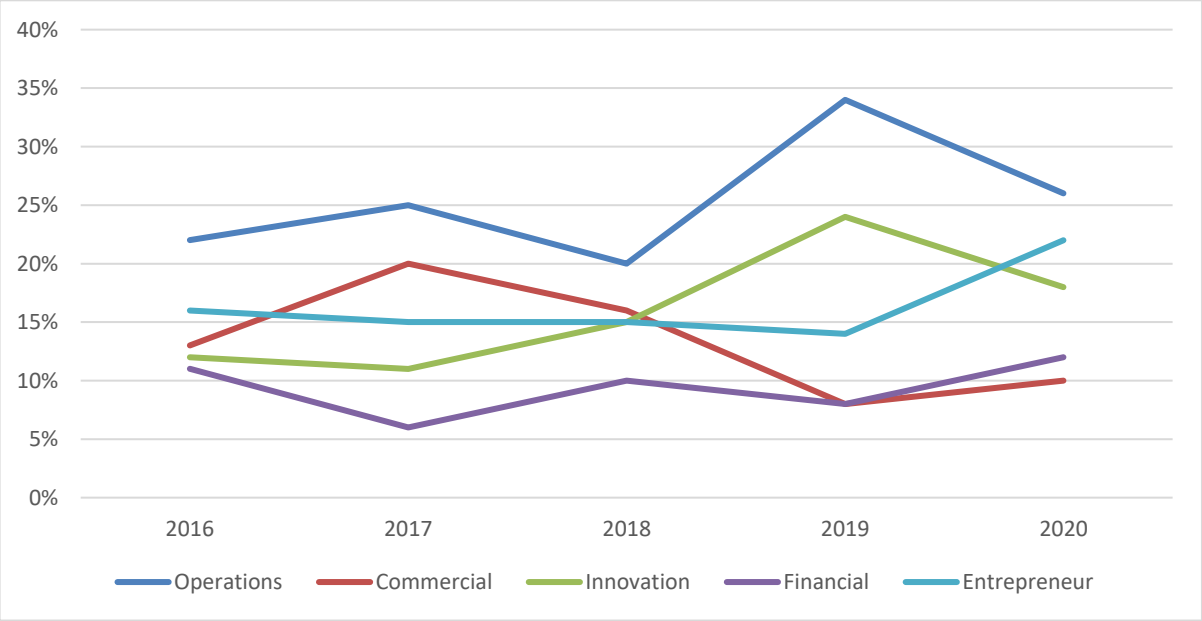
Although innovation has shown great relevance in the general panorama, being in third place both in the world and Brazilian lists, the longitudinal study of the background of the most innovative companies lists' CEOs showed that the most prominent areas among these CEOs varied over time.

6.1.2.1 Most relevant background longitudinal analysis

The five most relevant backgrounds were the same in the world and in the Brazilian lists: operations, commercial, innovation, financial, and entrepreneur. Together, they compose 80.6% of the world cases and 77% of the Brazilian cases, varying only in their positions. Therefore, only these backgrounds were used in the longitudinal analysis.

Figure 8 shows that the innovation background had 12% of the CEOs in 2016 and 18% in 2020, a 6% increase, reaching a peak of 24% in 2019. The commercial area, which was the second most relevant in 2017, with 20% of CEOs, dropped to the fifth most relevant in 2020, with 10% of cases, a 10% decrease. Operations remained in the leading position for the five years of the study, ranging from 22% in 2016 to 26% of the cases in 2020, a 4% increase, with 2018 being the year with fewer cases, 20%, and a peak in 2019 of 34% of the cases.

Figure 8: Comparative evolution of Forbes and BCG's CEOs' background over time.



Source: designed by the author.

The most relevant area of the Brazilian list, shown in Figure 9, was commercial, which outperforms the others between 2016 and 2018, starting with 29% of cases, rising to 31% in 2017, but with a significant drop to 19% in 2019, having a slight

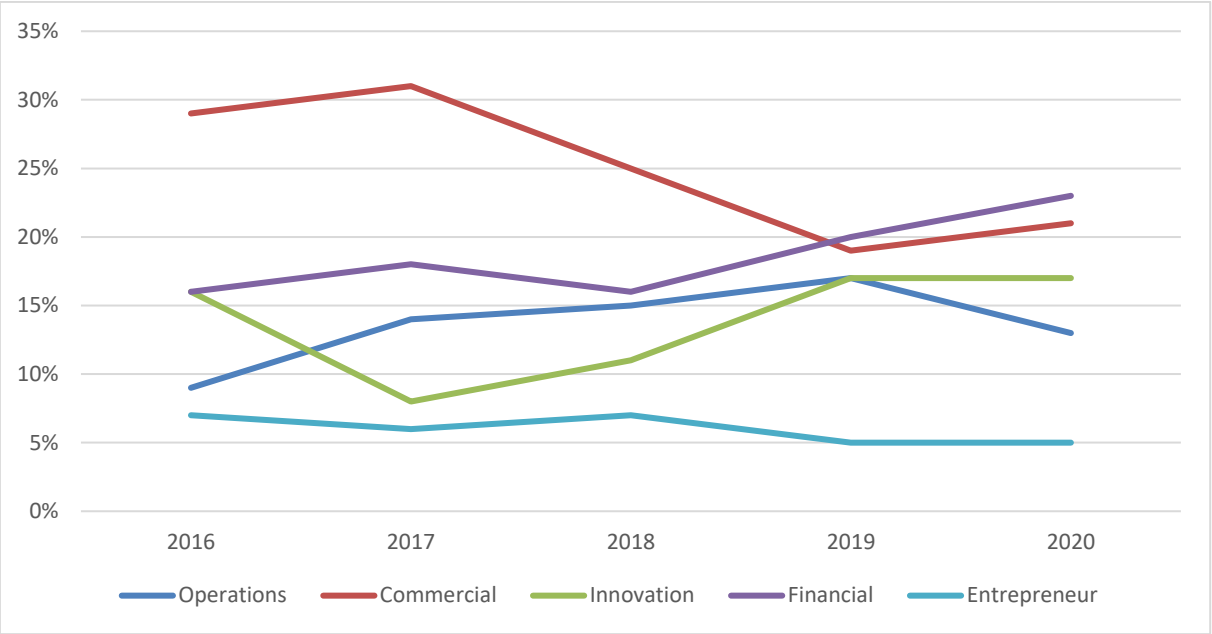
increase in 2020, in which it reached 21% of cases, but lagging behind the financial area since 2019. At first glance, the commercial background seems to make sense for Brazil, which mainly produces innovations developed abroad.

Following these data, the innovation classification had a general variation of 1%, with 16% in 2017 and 17% in 2020. In 2016 the innovation background was evenly matched with financial as the second most relevant. However, in 2017 this number dropped to half of the cases, an 8% decrease, being overtaken by the operations area. In 2018 and 2019, there was a gradual increase, in which innovation reached its highest mark of 17% of CEOs, evenly matched with the operations area. Innovation was finalized in 2020 with the same 17% of cases, third in relevance between the classifications, below the financial and commercial areas. These fluctuations, especially between 2016 and 2017, could result from the political and economic instability during the period: impeachment of President Dilma Rousseff, tax exemption cuts for R&D activities, and economic crisis.

The financial background, first evenly tied with innovation in 2016 in the second position, remained in second place, with slight variations until 2018, and gained more importance in 2019 and 2020, with a 7% increase, going from 16% in 2016 to 23% of cases in 2020, when it reached leadership in relation to the other backgrounds. The operations area had a 4% increase in the period, going from 9% of the cases in 2016 to 13% in 2020, ranking fourth in relevance in 2020, despite being much less relevant in the Brazilian list than in the world ranking.

As stated before, the differences in the world and Brazilian profiles may be explained by conjunctural aspects, moreover, by the position Brazil has assumed in the world division of labor. Most value chains are dominated by multinationals (Arbix et al., 2017; Salerno, 2012), and most innovation-related activities are performed outside the country.

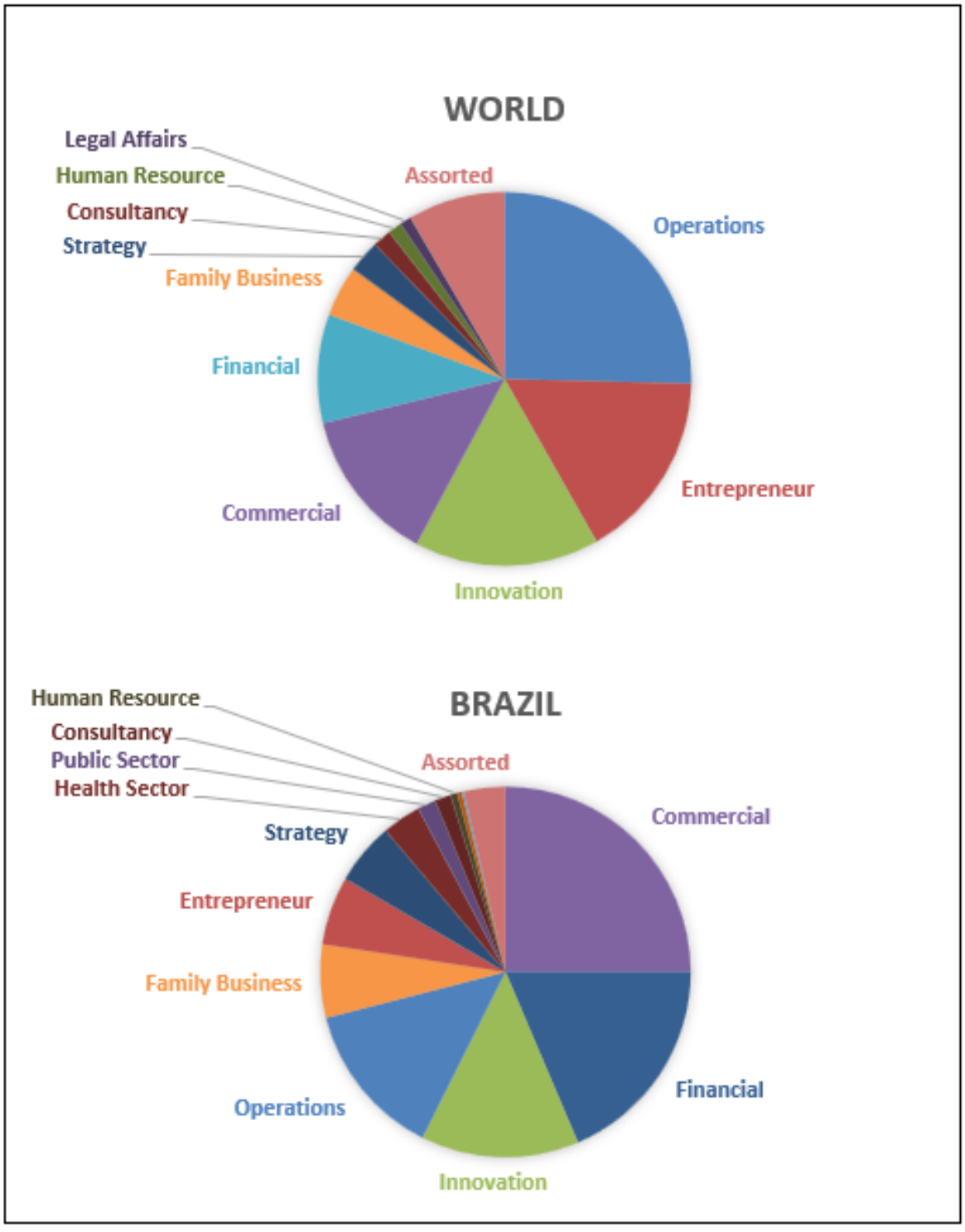
Figure 9: Comparative evolution of Valor's CEOs' background over time.



Source: designed by the author.

Even though the third place is not irrelevant, the data suggest there was low representativeness of CEOs with innovation as a career background, considering that it was, on average, 15% of the cases, as seen in Figure 10. In companies from Forbes and BCG's lists, in 2016, 16% of the CEOs worked directly with innovation or related areas at some point in their careers, based on the classification presented in Table 8, 11% in 2017, 15% in 2018, 24% in 2019, and 18% in 2020. The leap from 2018 and 2019 numbers, when Forbes stopped to release the ranking and started to publicize BCG's list, may be partially explained by the change in the methodology used by Forbes and BCG to create the ranking and the fact that BCG's list ranks only the 50 most innovative companies, while the Forbes' list had 100 firms. From the Valor list, innovation CEOs were 16% in 2016, 8% in 2017, 11% in 2018, and 17% in 2019 and 2020.

Figure 10: Overall CEOs' background distribution in the world and Brazilian lists.



Source: designed by the author.

Even though CEOs with an innovation background have reached a small percentage, it is not possible to state that they effectively worked with strategic innovation. Many may have been involved in incremental innovation or product

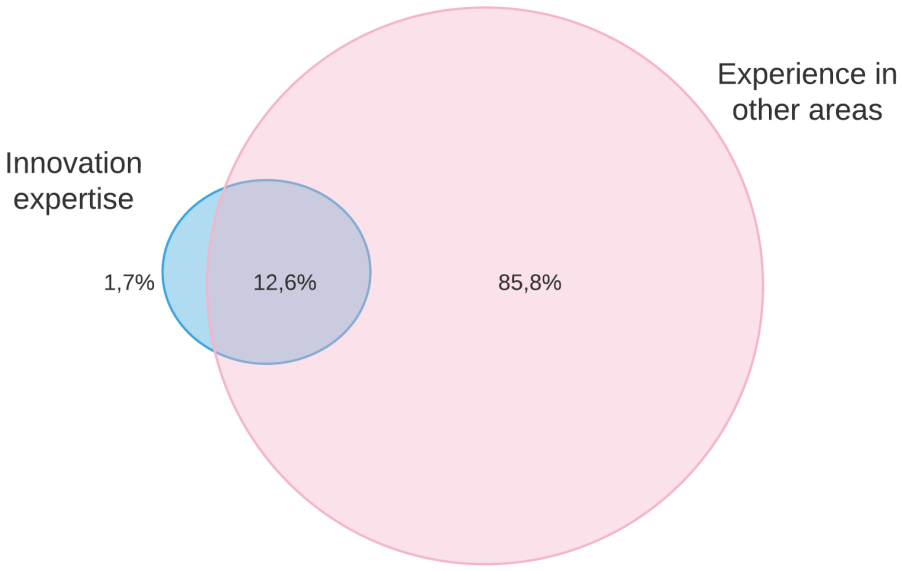
development. Thereby, if the detachment of CEOs with a strategic innovation background was possible, this representativeness could be even lower.

6.1.2.2 Detailed background of CEOs classified as innovative

Of the 73 CEOs identified as having worked with innovation in all lists from 2016 to 2020, 61 had their detailed resumes posted on LinkedIn, Bloomberg, or the company's website. Twenty-nine of them were from Valor's lists, and 32 of the CEOs were from organizations presented on Forbes and BCG's lists.

Considering all the CEOs classified with an innovation background, 89% were also experienced in other areas, with only 11% of them having worked exclusively with innovation in their entire career. Increasing the universe of analysis for all 900 CEOs studied, this represents that 12.6% of CEOs have diverse experience in and outside innovation, as recommended by the literature (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014), 1.7% has experience only in innovation and 85.8% only have experience in areas that are not related with innovation, as seen in Figure 11.

Figure 11: Distribution of CEOs with innovation and outside innovation expertise.



Source: designed by the author.

CEOs who have worked with innovation had an average of 10.4 years of experience in innovation for companies on the worldwide list and only 4.8 years for Brazilian companies, as shown in Table 11.

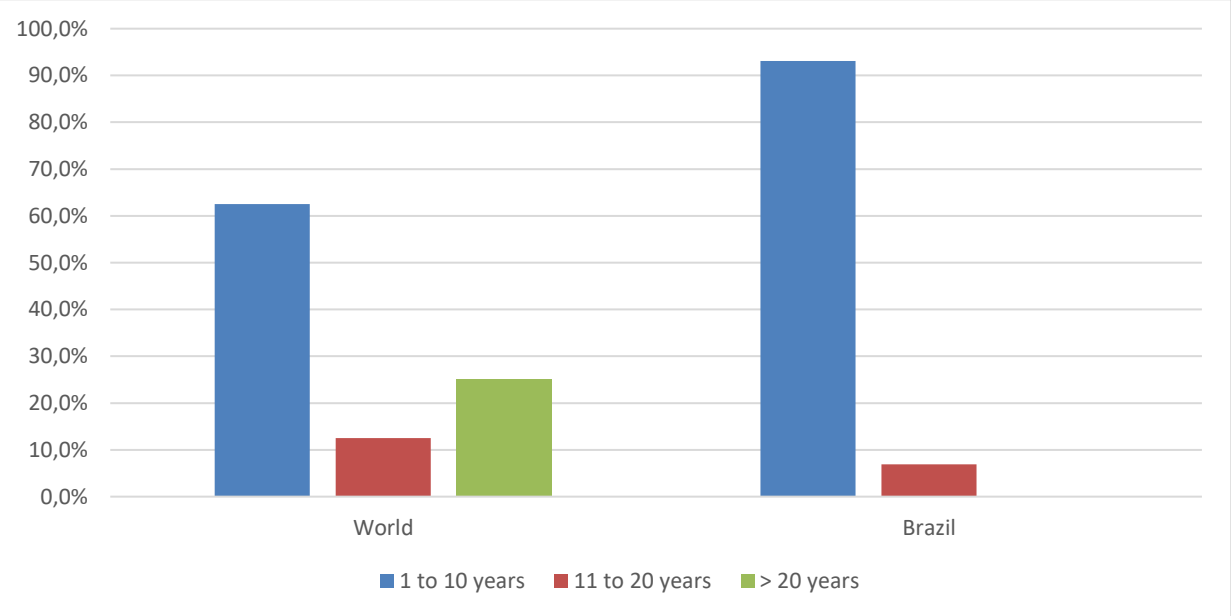
Table 11: CEOs' experience in innovation.

Experience in innovation	World	Brazil
1 to 10 years	62.5%	93.1%
11 to 20 years	12.5%	6.9%
> 20 years	25%	0%
Average (years)	10.4	4.8

Source: designed by the author.

Figure 12 shows that, in the Brazilian lists, 93.1% of the CEOs have less than ten years of experience, given that the average is five years, indicating that these CEOs' time of experience in innovation is relatively low. In Forbes and BCG's lists, 62.5% of CEOs have 1 to 10 years of experience, 12.5% from 11 to 20 years, and 25% have more than 20 years of experience in innovation.

Figure 12: Distribution of experience of the innovative CEOs.



Source: designed by the author.

It was also considered the time distance between working with innovation and when the individual was named CEO shown in Table 12. A time from the first job with innovation to the CEO position that equals zero means that the position performed immediately before being the CEO was related to innovation. They appear in 12,5% of the world lists and 10,3% on Brazilian lists. Admitting that the list of companies in the world is more innovative than those in the Brazilian list, the percentage difference is expected.

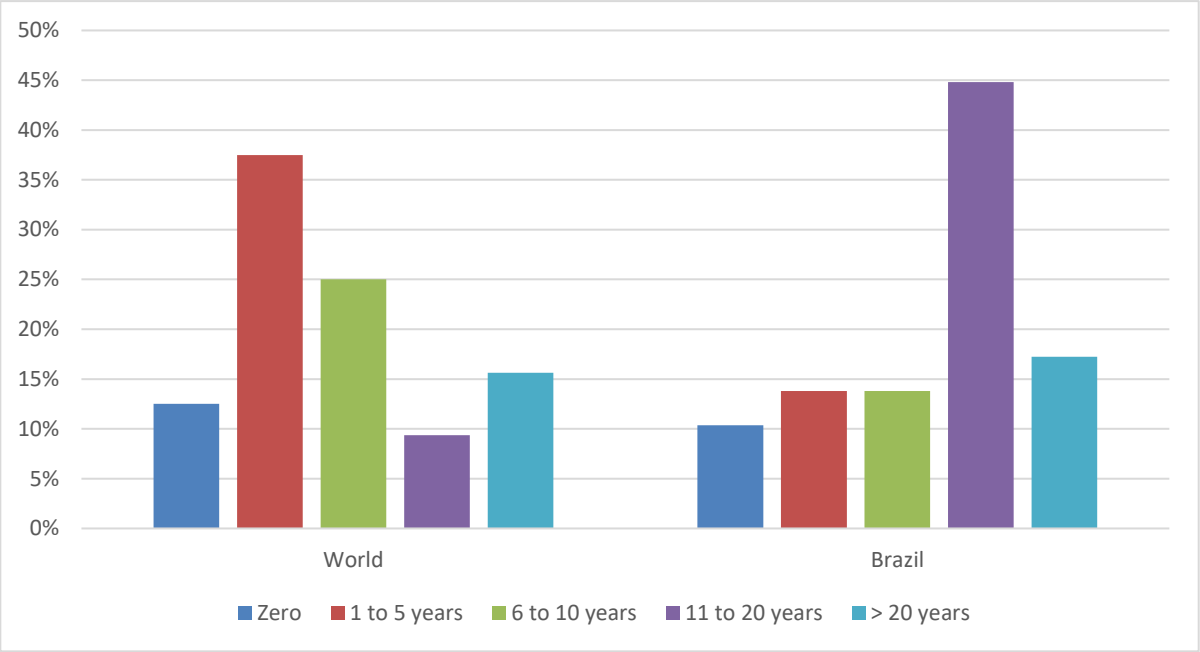
Table 12: Average time from the first job with innovation to a CEO position.

Time from the first job with innovation to CEO position	**World**	**Brazil**
Zero	12.5%	10.3%
1 to 5 years	37.5%	13.8%
6 to 10 years	25.0%	13.8%
11 to 20 years	9.4%	44.8%
> 20 years	15.6%	17.2%

Source: designed by the author.

Figure 13 shows that individuals who work with innovation in the world's most innovative companies manage to reach higher levels in the corporate hierarchy before becoming CEOs in roles related to innovation than in Brazilian-based companies. Thus, 50% of the cases in the world lists take from zero to 5 years to leave an innovation role and become the CEO of the organization, and, in Brazil, 62,1% of the CEOs take more than 11 years to do the same.

Figure 13: Time from the first job with innovation to a CEO position.



Source: designed by the author.

6.1.3 Discussion

Literature has pointed out the complex role of strategic innovation managers and leaders (Bruneel et al., 2012; Fowinkel, 2014; Jonas, 2010; Kelley et al., 2011; Marvel et al., 2007; O'Connor et al., 2018; O'Connor & McDermott, 2004). They face several obstacles in their professional activities, as most companies' innovation projects are incremental (da Silva et al., 2014; Salerno et al., 2015). Strategic innovation leaders deal with a portfolio of projects immersed in huge uncertainties; projects suffer interruptions and discontinuity and sometimes take decades to launch in the market. A project can last longer than a manager in the company.

Despite the challenges, literature shows that strategic innovation leaders must be knowledgeable not only in technology but also in other fields (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014). Additionally, Cummings and Knott (2018) showed that firms with a CEO with technological expertise perform better at innovation management; the same may be even more true for strategic innovation management. Therefore, it would be expected that the most innovative firms had CEOs with innovation backgrounds. The career path of CEOs of the most innovative companies was analyzed to investigate this

assumption whether and to what extent the CEOs of most innovative companies have an innovation background.

The empirical investigation analyzed the CEOs' careers from Brazilian-based and the world's most innovative companies between 2016 and 2020. Although the literature highly recommends that innovative companies are led by people experienced in innovation (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017), the results presented low representativeness of CEOs with an innovation career background, of 16% in the world lists, and 13,8% in Brazilian cases. Once individuals who seek to work with strategic innovation tend to focus on long-term results and that such innovation is crucial for the success and competitiveness of established innovative firms, this indicates that companies are missing the opportunity to use this resource in their executive leadership to boost innovation.

Companies that aim to use strategic innovation to enhance their innovation capacity and long-term growth could take advantage of the conduct of people with an innovation understanding and culture to support their projects long-term against high uncertainty and failure rates and ascertain the effectiveness and success of strategic innovation projects. Nevertheless, most companies advertise themselves as innovative in the lists. Excluding the ones led by entrepreneurs and family businesses, which were managed by individuals who worked in areas focused on short-term results and considering operations, commercial, financial, and consultancy, it holds 50% of the CEOs from the world list, and 59% from the Brazilian list, which is not consistent with strategic innovation projects.

The longitudinal analysis of the results showed that the innovation experience gained relevance over the years studied in Forbes and BCG's lists, with a 6% increase between 2016 and 2020, the commercial area decreased its relevance by 3%, and operations remained the most relevant in the list for the entire period, having grown by 4%. In other words, the innovation background has expanded its significance over the years more than other areas, Figure 8. This growth may be explained by the increased pursuit of systematic strategic innovation development by established companies as a strategy to sustain long-term competitiveness.

Conversely, in the Brazilian list, the innovation background, having gone through a fall and recovery between 2016 and 2020, had merely a 1% overall increase,

Figure 9. The commercial area, which was the leader at the beginning of the study, decreased by 8% in the number of cases, while the financial area increased by 7% of cases. Such variations may have been due to political and economic factors present in the Brazilian context.

The detailed analysis of the career of CEOs who were experienced in innovation showed that the great majority of them were also experienced in areas outside innovation, about 86%, which is consistent with the literature (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014). However, considering the entire universe of CEOs analyzed in this study, Figure 11, less than 13% of the CEOs of the awarded companies as the most innovative in the world and Brazil met the recommendations made by the literature regarding the need for a CEO experienced in innovation, and that these people should also be experienced in areas other than innovation (Bruneel et al., 2012; Chung & Kang, 2019; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017; O'Connor et al., 2018). It was noted that many of the CEOs, earlier in their careers, stopped working in innovation to reach higher management positions in areas such as commercial and operations. Companies that prioritized expert leadership in innovation when choosing the CEO represented about 14% of the cases, among whom also had a varied experience were less than 13%, and those that did not have a CEO experienced in innovation constituted the overwhelming majority of 86% of the organizations, Figure 11.

The time CEOs spent working in roles related to innovation was very different in the world and Brazilian lists, being 10 and 5 years the average, respectively. In other words, the representatives from Brazilian companies did not have extensive experience in innovation, representing half of the experience compared to worldwide CEOs. Nevertheless, 62% of the Brazilian CEOs took between 11 and 30 years from their first job with innovation to reach the CEO position, indicating that the contact with innovation projects probably happened early in their career, which is consistent with the problem reported in the literature that innovation managers have difficulties in advancing their careers within innovation (O'Connor et al., 2018; O'Connor & McDermott, 2004).

CEOs who worked with innovation in the world's most innovative companies reached higher levels in the corporate hierarchy before becoming CEOs in roles

related to innovation much faster than in Brazilian-based companies. The former took eight years on average, while the latter took 13 years. Wherein 50% of the cases in the world lists took from zero to 5 years to leave an innovation role and become the CEO of the organization, against 62% of the Brazilian cases that lingered 11 to 30 years to reach the same position.

In companies with worldwide recognition for innovation, CEOs' experience in innovation was longer, averaging ten years. However, only 37,5% of CEOs had more significant experience in innovation-related areas than the average. In comparison, 50% had less than five years of distance between the innovation role and the CEO position. Most reached the CEO position shortly after leaving an innovation role. In other words, half of the CEOs who worked in areas related to innovation managed to reach higher positions in the company while working with innovation.

Times from first working with innovation to CEO positions equaling zero were found in the Brazilian-based and world CEOs. They represent about 12% of cases in which the CEOs have a background in innovation, which means 1% of all cases. Those cases were probably aligned with at least the literature's assumption highlighting the need for a structured strategic innovation function, allowing career development within innovation (O'Connor et al., 2018). There is also a need for the existence of strategic innovation roles through diverse hierarchal levels of the organization (Bruneel et al., 2012; Cortes & Herrmann, 2021; Probst et al., 2011) and the promotion of the direct involvement of the TMT members in strategic innovation projects (Bruneel et al., 2012; Garms & Engelen, 2019; Lazzarotti & Manzini, 2018), although the existence of TMT positions and other hierarchical levels in innovation or the structure of the companies studied have not been directly analyzed in this investigation.

Although there was not a significant difference in the overall percentage of CEOs with innovation experience in the most innovative companies in the world, the CEOs who did have this expertise seem to have been able to work longer with innovation and achieved more strategic roles within the strategic innovation function in their companies. Thus, for Brazilian companies to develop strategic innovation regularly, it would be interesting to create hierarchical positions in innovation in the organization's TMT, such as the CIO, ensuring more significant experience in strategic innovation while developing skills and abilities in other areas, and a shorter gap between the period they worked with innovation and becoming a CEO.

6.2 TALENT MANAGEMENT PRACTICES OF INNOVATIVE COMPANIES

The quantitative study of the talent management practices for innovation aimed to identify which talent management practices were used by innovative Brazilian companies to retain employees and if these practices differ from those used in traditional companies. Therefore, a comparative study about how innovative and traditional Brazilian companies promote talent management practices was performed using 2017's GPTW database.

The comparative study of talent management practices used in innovative and traditional companies was performed cooperatively with the HRM master's researchers Marcela Zucherato Ribeiro Ortiz and Simone Mendes within the scope of PROGEP's course Advanced Topics of Human Resources.

The Brazilian's GPTW survey has been performed since 2006 by the *Fundação Instituto de Administração* (FIA). Access to the 2017's Brazilian GPTW database has been formally requested through the PROGEP, according to documents presented in Appendix D.

6.2.1 Methodology

For comparison purposes, the organizations awarded as one of the Brazilian 150 GPTW were classified into two groups: innovative and traditional companies, considered innovative companies those that were also granted as one of the Brazilian 150 most innovative in the same year, and traditional firms those that were in the GPTW list and not in the most innovative rank.

The literature's most cited talent management practices were used to select the data from 2017's Brazilian GPTW to perform the analysis and validate the HRM for innovation talent management and retention.

The literature review on talent management, retention, and innovation, specified in Table 1, returned 31 papers. The selection process reduced it to only four articles, and the book chapter "Developing and Retaining Talent" from O'Connor et al. (2018)'s book was added to the theoretical foundation.

Hence, to amplify our theoretical base and identify the relevant literature to support the analysis, we have removed the term innovat* from the search and selected the papers that were from one of the following well-regarded HRM journals (Donizetti & Fischer, 2018): *Asia Pacific Journal of Human Resources; German Journal of Human Resource Management - Zeitschrift fur Personalforschung; Human Relations; Human Resource Management Review; Human Resource Development Quarterly; Human Resource Development Review; Human Resource Management; Human Resource Management Journal; Human Resources for Health; Human Resources International Journal of Training and Development; International Journal of Human Resource Management; International Journal of Human Resources Development and Management; Journal of Career Development; Journal of Human Resources; Journal of Human Resources in Hospitality & Tourism; Journal of Labor Research* and *Journal of Vocational Behavior.*

The content analysis of the papers enabled a deepening in the literature on talent management and retention and the selection of the HRM practices to be investigated. For the assortment of the HRM practices for the study, all the practices cited by the literature review papers concerning innovation were listed and counted. The practices mentioned in more articles were selected: rewards and incentives, performance appraisal, and employee development. According to the literature's assumptions, it was expected that innovative organizations develop talent management practices through an exclusive approach; innovative companies focus more on rewards and incentives practices to retain employees than performance appraisal and development practices; and traditional companies use fewer rewards and incentives, performance appraisal and development practices to retain employees.

6.2.1.1 Data collection

The empirical investigation was based on the survey database that annually defines the Brazilian's GPTW. The requested database was from 2017, as it was the most recently published at the time, thus providing updated data on HRM practices in Brazilian companies. The 2017's survey database counted on answers from more than 250.000 professionals from 450 companies, which allowed a consistent understanding of the Brazilian business scenario bringing relevance to the studies derived from this database.

The database's policy stated that "the methods and procedures adopted are transparent and simplified, preserving the scientific and statistical legitimacy of research" and that "all the contents and criteria adopted by research are based on a solid theoretical basis and updated about Human Resource Management", bringing credibility to the present study. Annually, the result of this research, *As 150 Melhores Empresas para Trabalhar no Brasil* (The 150 Great Place to Work in Brazil), is published by the *Guia Você S/A* magazine.

The Brazilian's Most Innovative Companies rank of 2017 performed by Valor magazine, along with the Strategy& - Brazil, from PwC, was used to identify the most innovative companies of the GPTW's rank of 2017. Their methodology defines innovation as "the generation and structured development of new ideas on a regular basis that generates significant value for companies". It qualitatively evaluates companies by the criteria: intention and effort to effectuate innovation, obtained results, and market evaluation. The methodology emphasizes that the intention and innovation efforts must be primarily located in Brazil. The database of this research was not used in the analysis. The use of the 2017's Brazilian's Most Innovative Companies list was limited to selecting the organizations awarded by both ranks.

The intersection of the 2017's Brazilian 150 GPTW and 150 Most Innovative Companies was used to constitute the two groups of companies for the analysis: innovative, companies that were awarded on both ranks; and traditional, companies that were awarded as one of the GPTW but were not ranked as one of the most innovative.

Both GPTW and the Most Innovative Companies Brazilian's researches were based on the voluntary enrolment of the organizations. Hence, we can infer that the company's participation in one research or both means that the company wishes to be publicly recognized for its efforts to seek excellence in HRM systems and innovation practices. Therefore, the "traditional" nomenclature indicates that the company was not awarded or participated in the most innovative survey, and it is not linked to any management or performance characteristics of these companies.

The list of GPTW companies published by the *Guia Você S/A* is established according to the "Index of Happiness at Work" (IHW) that is composed of the following:

- Labor Quality Index (70% of the IHW): formed by results related to the employee's view of the company in the framework of an organizational climate survey;
- Quality Index of People Management (30% of the IHW): formed by results related to "what the company offers its employees" through analysis of quantitative and qualitative material and journalists' interviews.

This study compares the practices declared in the Quality Index of People Management by innovative companies versus those carried out by traditional companies to observe if there were differences in the development of actions that contribute to talent management and retention.

The creation of the two groups of companies and the selection of the most relevant HRM practices in the talent management and retention literature allowed the determination of the specific data to be studied. Thus, the data concerning rewards and incentives, performance appraisal, and employee development was chosen.

In the GPTW research data request form, the outline of the scientific research for which it would be used was presented, including its objective, theme, research problem, methodology, and analysis plan. In addition, the codes of the survey questions selected for analysis and the list of companies classified as innovative and traditional for this research were sent, with the aim that the data of each group were sent separately.

In compliance with the term of responsibility required to obtain the GPTW database, the raw data from the survey were made available without any information that would allow the identification of the organizations to preserve the confidentiality of the participating companies that generated the data.

6.2.1.2 Data analysis

The database survey topics related to performance appraisal, development, and rewards are presented in Table 13.

Table 13: GPTW database selected topics.

Construct	HR practice	GPTW questions codes
Performance appraisal	Formal goals definition	V429, V431, V435, V436, V437, V439, V443
	Performance appraisal process of non-managerial employees	V892, V893, V894, V895
	Use of performance appraisal results	V896, V898, V900
Rewards and incentives	Formal and structured remuneration program	V631, V634, V638, V640, V642
	Short-term variable remuneration	V723-725, V727-V729, V731-V733, V735-V737
	Long-term variable remuneration	V741-V743, V745-V747, V753-V755, V757-V759
	Occasional variable remuneration	V763-V765, V767 -V769
	Mutual use of team-based evaluation and performance reward	(V435, V437) x V727-V729, V731-V733, V741-V743, V745-V747, V753-V755, V757-759, V767-V769
	Use extrinsic rewards exclusively for executive positions	V727-V729, V731-V733, V735-V737, V741-V743, V745-V747, V753-V755, V757-759, V767-V769
	Non-financial recognition	V772, V774, V776, V778
Development	Decision-making about promotion and development	V858, V860, V862

Source: designed by the authors.

For quantitative data analysis, the percentage of companies in each group that developed these practices was calculated. Then, the percentages of use of the practices between innovative and traditional companies were compared through their simple subtraction, and its results were analyzed based on the theoretical reference presented.

Differences of at least 10% between the two groups were considered relevant. The data was discussed, considering the practices to which they were linked. Groupings and combinations of some types of practices in the same company were also analyzed according to excerpts from the literature that mentioned the use of practices that were included in the GPTW database: team-based evaluation and performance reward should be used together (Aagaard & Andersen, 2014; O'Connor et al., 2018; Farouk et al., 2016), and companies tend to use extrinsic rewards exclusively for executive positions (Shaikh & O'Connor, 2020). GPTW data related to variable remuneration was divided into groups of employees' positions, directors; managers and supervisors; and administrative, technicians, and operators. Therefore it enabled a more detailed analysis of this data.

6.2.2 Results

The comparative investigation of how Brazilian companies promote talent management practices considered the intersection between the most innovative and great place to work 2017's ranks to divide GPTW award-winning companies into two groups: innovative and traditional.

There were 35 companies from the Brazilian rank, Valor's Most Innovative Companies of 2017, that also figured on the list of the 150 Great Place to Work - GPTW rank of 2017. They represent 23% of organizations. The 2017's GPTW database was analyzed to compare the similarities and differences between these two groups of companies in the use of the HRM practices identified in the literature as those related to talent management and retention, performance appraisal, development, and rewards.

It is crucial to highlight that, despite the present analysis of HRM practices in innovative companies, the primary objective of the GPTW survey is to comprehensively map the HRM practices utilized for all employees within these companies without differentiating between those involved in innovation and those who are not and the development of strategic or incremental innovation.

6.2.2.1 Evaluation

The performance appraisal was approached by questions concerning goals, the assessment of non-managerial employees, and the use of performance appraisal results.

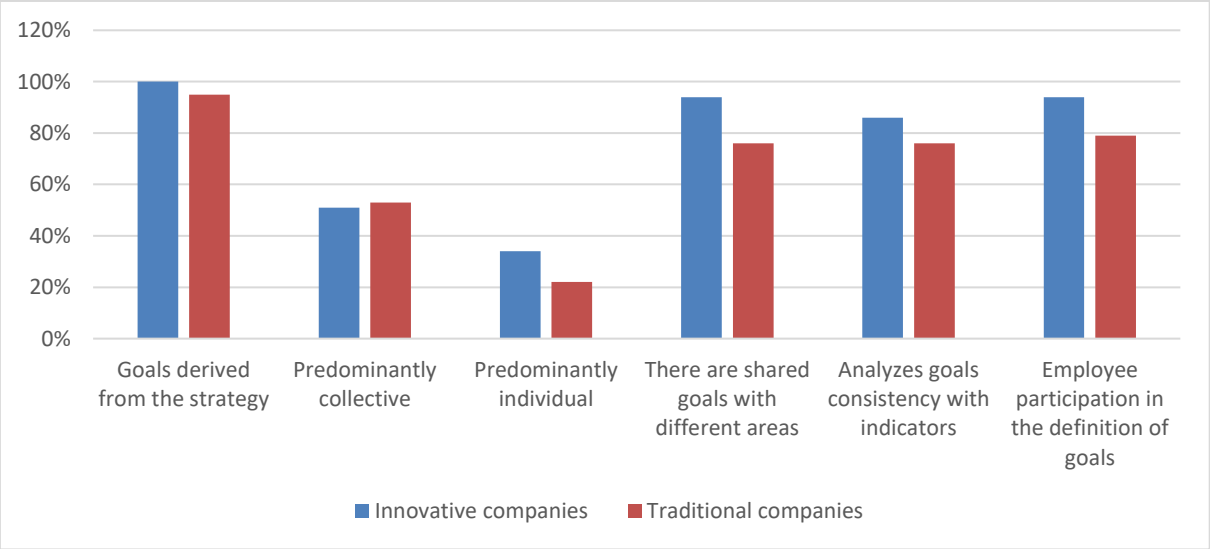
In all innovative companies surveyed, goals were derived from strategy, which is also very common in traditional companies and follows the talent management policy, according to Thunnissen et al. (2013). The use of goals shared between different areas is a widespread practice in innovative companies, 94%, an 18% higher percentage than in traditional companies, which suggests an alignment with Marx et al. (2016), who argue that metrics should be aligned between areas participating in the project. Conversely, for O'Connor et al. (2018), sharing goals with other areas implies less control of results. However, although 51% of innovative and 53% of traditional companies predominantly use collective goals, only 34% of innovative firms and 22%

of traditional ones predominantly use individual goals, the latter being 12% more used by innovative companies, Figure 14.

Those responsible for achieving the goals participate and influence their definition mostly in innovative companies, 94% of the innovation group, an 18% difference from traditional firms, which is aligned with O'Connor et al. (2018)'s recommendation that considers more appropriate to assess people who work with strategic innovation projects considering what is under their control. Participation in goal setting allows employees to negotiate their goals according to the uncertainties they have to deal with, allowing them to deliver a good individual performance indicator, even in a turbulent context.

Innovative companies showed more concern in aligning the consistency between the area's indicators with the goals of different areas compared to traditional companies, 86% and 76% of the cases, respectively.

Figure 14: Goals defined in a formal and structured way.

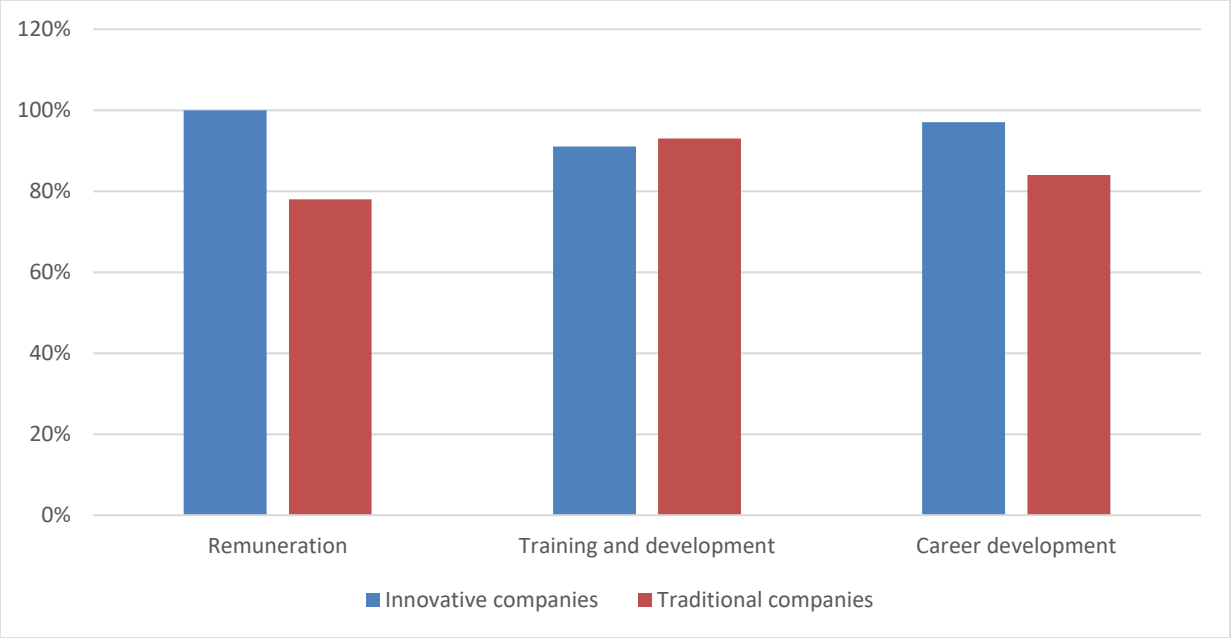


Source: designed by the authors.

The performance appraisal results were unanimously used by innovative firms in decisions on remuneration. 97% of them use it in decisions about career development, and 91% in decisions about training and development, Figure 15. This result can be associated with the need for innovative companies to encourage innovative employee behavior through assessments that address performance

effectiveness at an individual or collective level, as discussed by Aagaard et al. (2014). In this respect, 78% of the traditional companies used evaluation outcomes in decisions regarding remuneration, 22% less than the innovation group, and 84% of them used this parameter to decide over career moves, 13% less than innovation firms. However, more traditional companies have a similar and high use of performance appraisal for decisions concerning training and competence development, indicating a link between the individual evaluation and developmental plans, as pointed out by O'Connor et al. (2018) for strategic innovation employees.

Figure 15: Use of performance appraisal results.

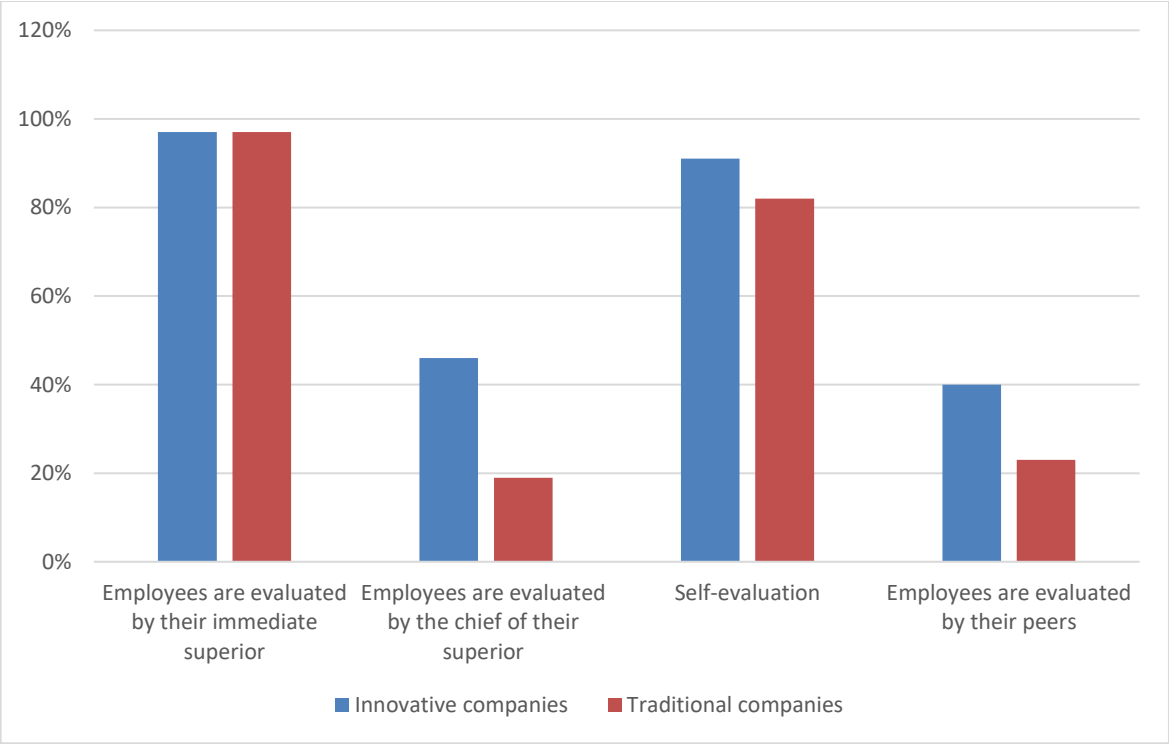


Source: designed by the authors.

The evaluation process for non-managerial positions mainly relies on the participation of the immediate supervisor, 97% in both groups, Figure 16. However, in 91% of innovation companies, employees evaluate themselves, as 82% of traditional companies use this practice. A more significant difference between the groups was the participation of the chief of the employees' superiors. Innovation companies presented a 27% greater use of this approach than the traditional group, 46% of innovative and 19% of the traditional companies. Nevertheless, in 40% of the innovation firms, the employee is evaluated by his peers, while in traditional organizations, its use is 17% less representative. O'Connor et al. (2018) defend the importance of project managers having the chance to interact with senior management in their projects, demonstrating

the importance of the innovation process and associating with the possibility of career growth. Thereby, being evaluated by a member who is two steps higher in the organizational hierarchy can indicate employee exposition and interaction with superior levels of the company, which can be supported by the almost unanimous use of assessment results on career development decisions, shown in Figure 16.

Figure 16: Performance appraisal process of non-managerial employees.



Source: designed by the authors.

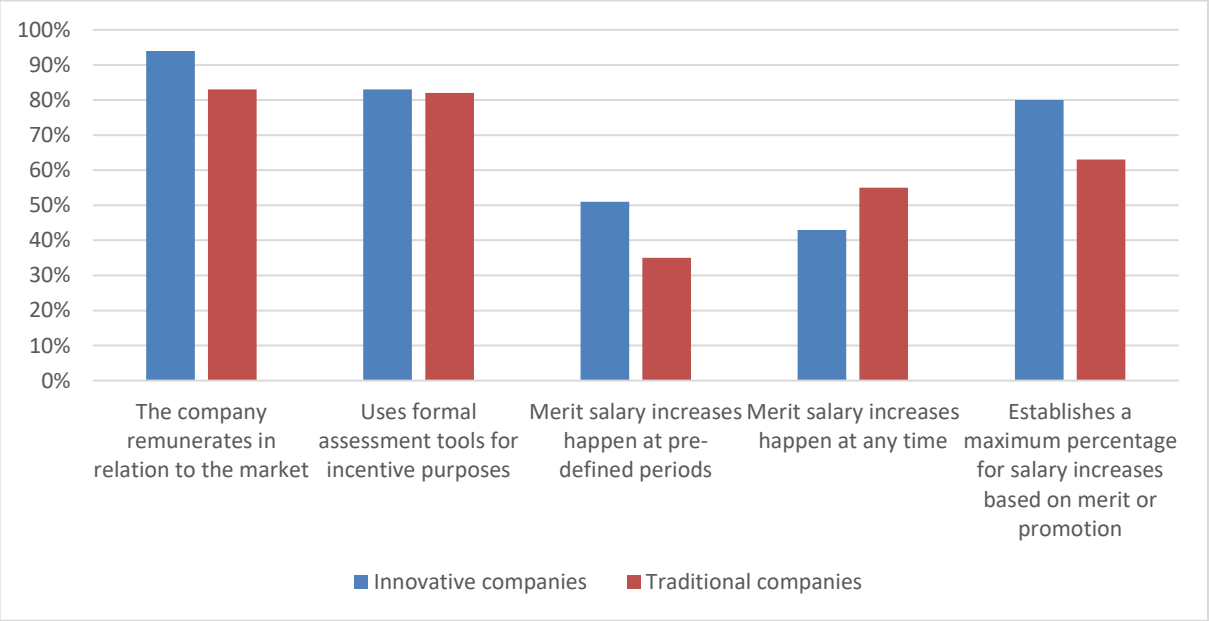
6.2.2.2 Rewards

Rewards and incentives were the most addressed subject in the talent management and strategic innovation literature, and also what provided more data to be analyzed: remuneration programs and practices and non-financial recognition. All the innovative companies affirmed to have a formal and structured remuneration program, which may be strategic. 94% of the innovative organizations had a defined position and were more aware of their remuneration in relation to the market, whereas 83% of the traditional group had this concern, which means, 11% less, as seen in Figure 17. Remuneration was pointed out as a key factor for retention, as employees

associate it with a return for the service that they provide to the company (Hausknecht et al., 2009).

Both groups utilized formal assessment instruments as a parameter to decide about employees' salary evolution, similar and significantly, over 82% of the companies. Innovative organizations were the majority when establishing a maximum percentage of increase in remuneration in cases of merit promotion compared to traditional firms. This practice was used by 80% of the former and 63% of the latter, differing by 17%. Wage increases occur mainly in pre-defined periods in innovative companies, 51% against 35% of the traditional organizations. Conversely, in 55% of the traditional companies, the wage increases can happen in any period, 12% more than innovative firms.

Figure 17: Formal and structured remuneration program.



Source: designed by the authors.

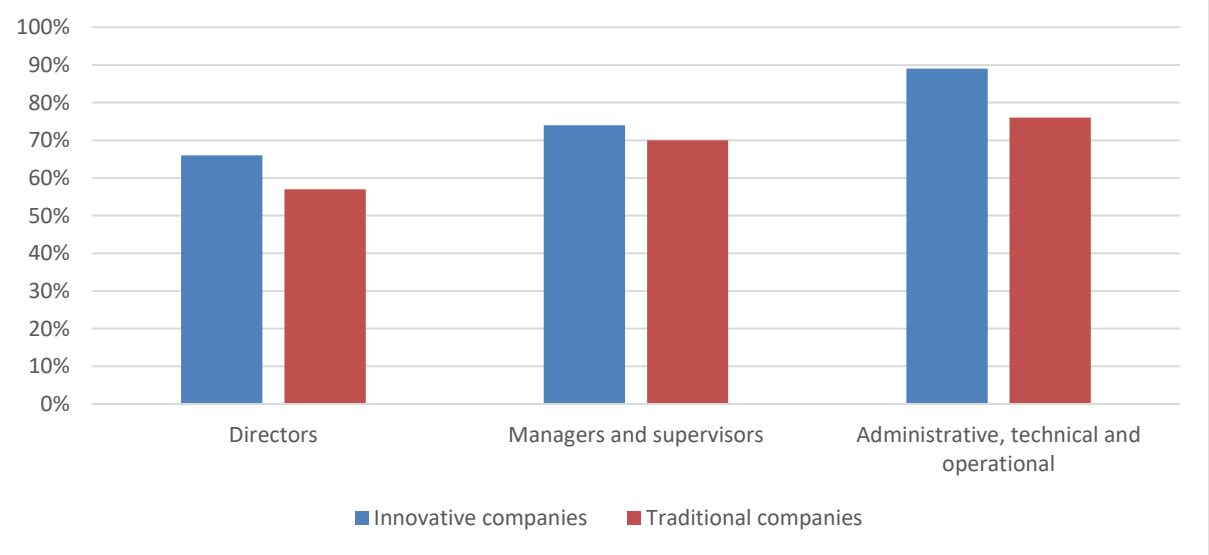
The analyzed data provided a range of variable remuneration practices: short-term, long-term extrinsic rewards, merits, and awards practices. While 11% of the traditional companies assumed not to use any variable remuneration practice in their HRM system, all innovative companies affirmed the opposite.

Among the short-term variable compensation practices, there were profit share, executive bonus, commission or award, and hiring bonus analyses. It was possible to

analyze the use of these practices according to the following positions in the hierarchy: directors; managers and supervisors; and administrative, technical, and operational positions.

Innovative companies slightly more used profit sharing for all the named positions. However, its more accentuated use was for administrative, technical, and operational positions, to which 89% of innovative companies distribute part of their profits, 13% more than traditional companies, as shown in Figure 18. In addition, both groups showed a reduction in the use of profit distribution the higher the hierarchical level of the position. In the innovative group, 74% of the companies allocated profit shares to managers and supervisors and 66% to directors. The use of performance pay can stimulate the employee's innovative behavior (Aagaard & Andersen, 2014). However, profit sharing and results are practices not directly linked to the employee's performance and seem to be mainly used for non-leadership positions.

Figure 18: Short-term variable remuneration: profit sharing.

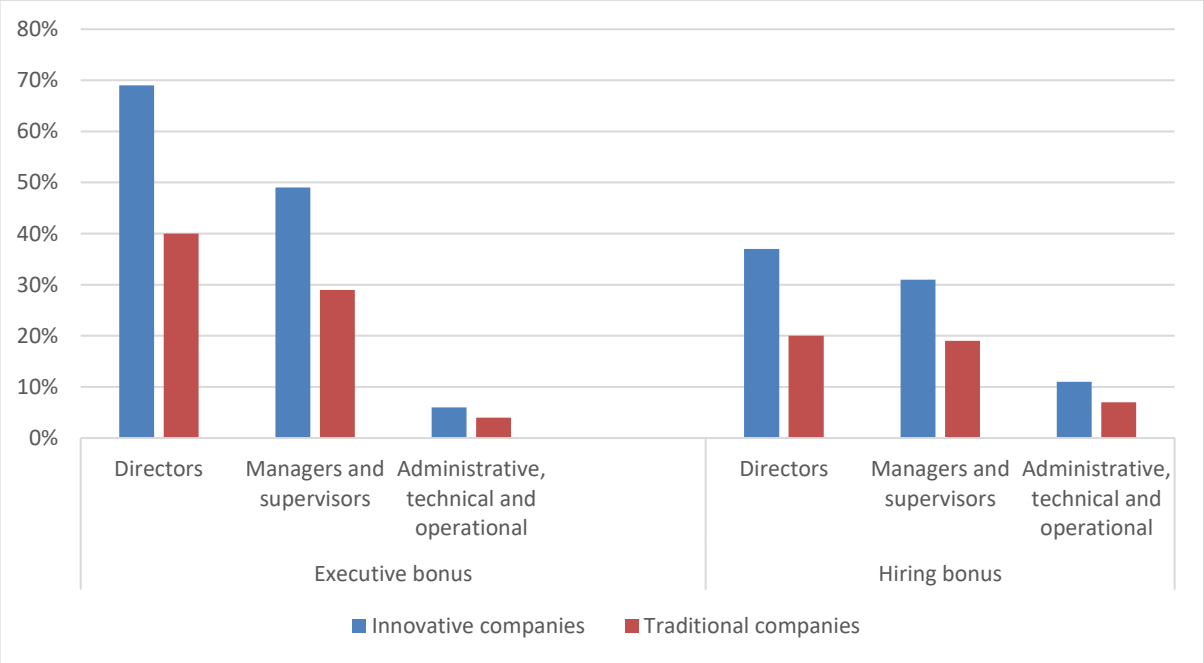


Source: designed by the authors.

The executive bonus was adopted by 69% of the innovative companies for directors, and 49% for managers and supervisors, while in the traditional organizations, 40% used it for directors, and 29% for managers and supervisors, a 29% and 20% difference, respectively, as shown in Figure 19. As expected, given that the bonus is aimed at executives, there was a low allocation to administrative, technical, and

operational positions in both groups. Notwithstanding, a small percentage of innovative and traditional companies stated that they provide the executive bonus for the non-managerial group. The hiring bonus follows a similar path, despite being less used than the executive bonus. 37% of the innovative companies and 20% of the traditional ones use it for directors, that is, 17% less. Managers and supervisors receive hiring bonuses in 31% of the innovative companies, against 19% of the traditional firms. Administrative, technical, and operational positions were given hiring bonuses in 11% of the innovative and 7% of the traditional companies.

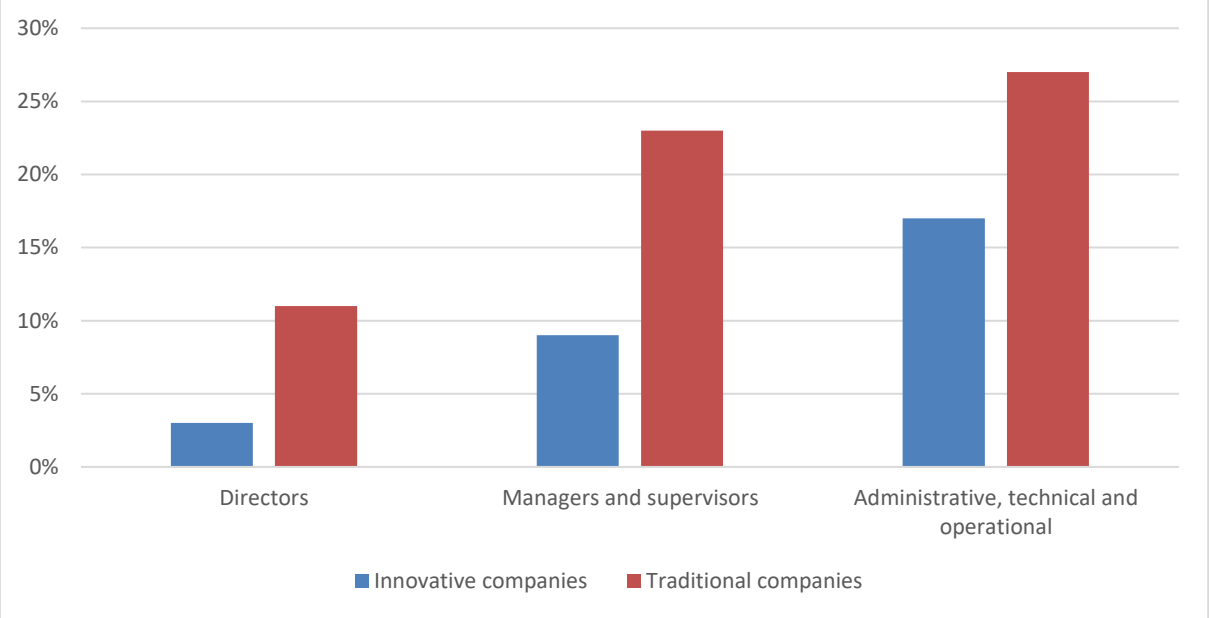
Figure 19: Short-term variable remuneration: executive and hiring bonus.



Source: designed by the authors.

Commission and awards were much less used by innovative than traditional companies. 27% of the former and 17% of the latter used this practice to incentivize administrative, technical, and operational employees. The use of this practice is even less prominent for leaders in innovative companies; less than 10% of them used it for managers and supervisors and 3% for directors, again showing a significant discrepancy in relation to the traditional companies, Figure 20.

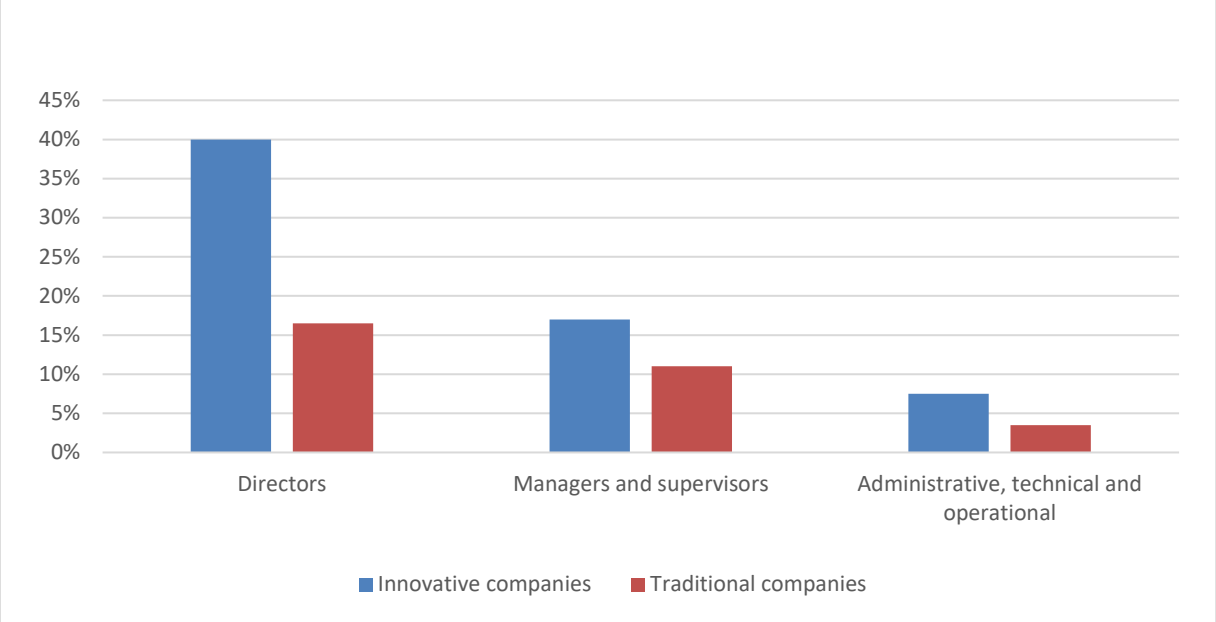
Figure 20: Short-term variable remuneration: commission or award.



Source: designed by the authors.

Long-term variable remuneration practices varied between plans for distribution/granting and options of stocks to employees; and deferred and retention bonuses. The practice of distributing and granting shares to employees and the option for their purchase by them was practically identical in both groups. The average use of them is shown in Figure 21. Shares remuneration practices were mainly used for directors, especially in innovative companies, in 40% of the cases. Traditional firms presented a 24% lower usage for directors, that is, 17% of the organizations. While only 17% of innovative companies gave access to this incentive to managers and supervisors, and 8% to administrative, technical, and operational employees. This reduction also applied to traditional companies, but with even lower use, 11% for the managers and supervisors and 4% for the administrative, technical, and operational roles.

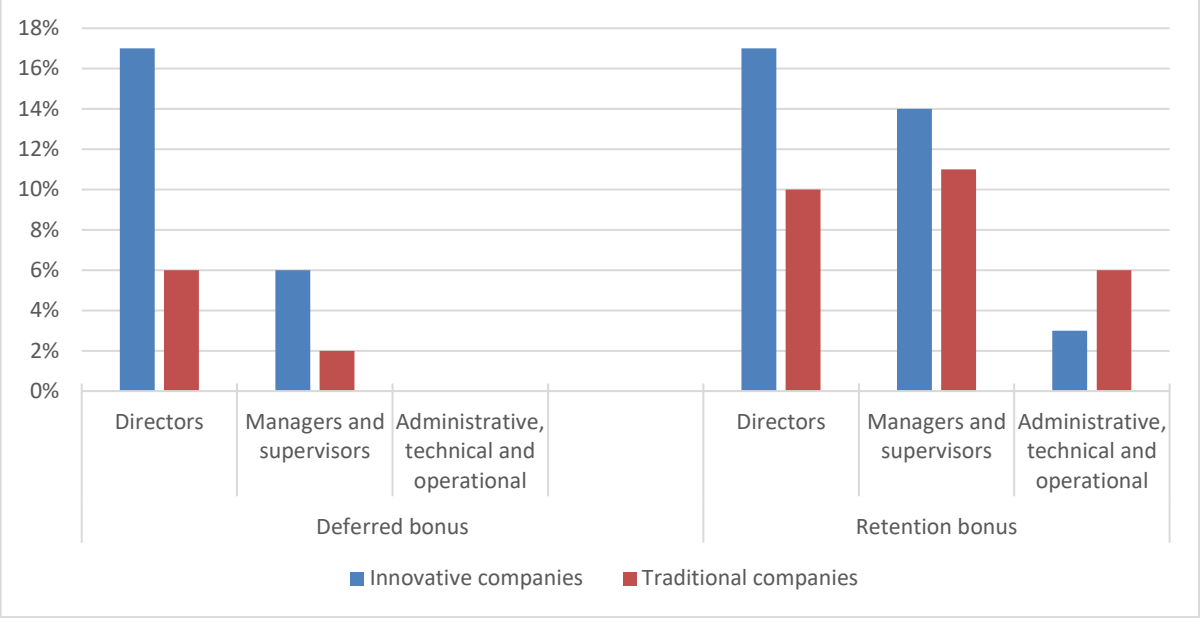
Figure 21: Long-term variable remuneration: shares distribution and stock options.



Source: designed by the authors.

The deferred bonus, a pre-established benefit paid at the end of a period, was conceded exclusively to leadership positions. It was addressed to directors in 17% of the innovative companies and 6% of the traditional, whereas 6% of the innovative organizations use it for managers and supervisors, and 2% of the traditional cases, as shown in Figure 22. The retention bonus was conferred for directors in 17% and for managers and supervisors in 14% of the innovative firms, against 10% of the traditional cases used for directors and 11% for managers and supervisors. This bonus was less common for administrative, technical, and operational employees, about 4% of the innovative companies and 6% of the traditional ones.

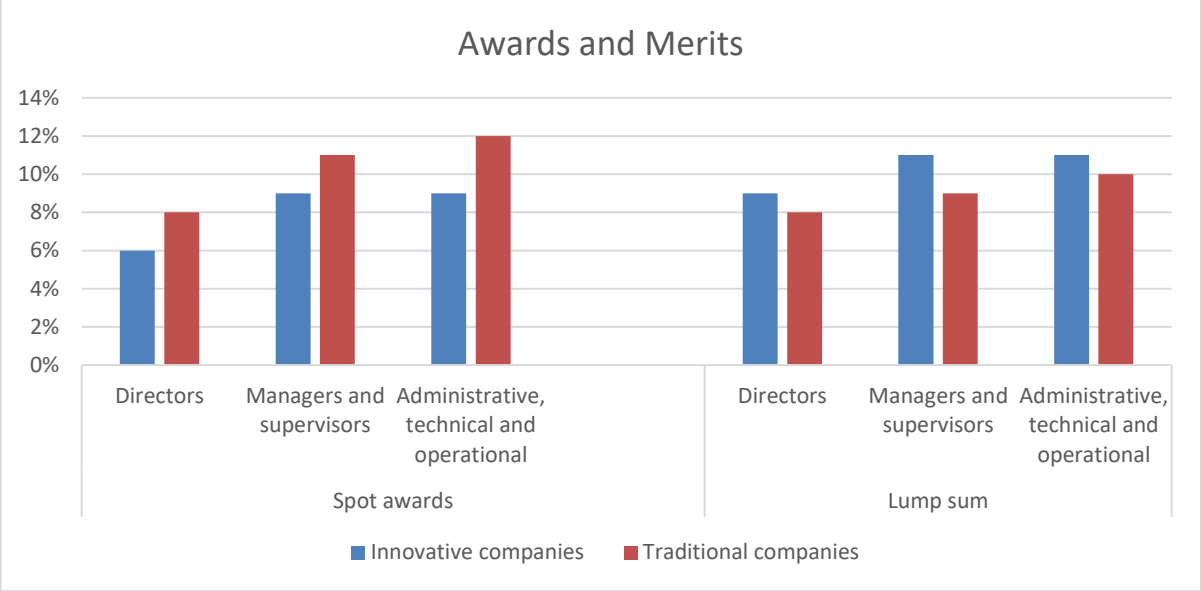
Figure 22: Long-term variable remuneration: deferred bonus and retention bonus.



Source: designed by the authors.

Other variable remuneration practices adopted by the companies were spot awards, and lump sum, occasional prizes based on exemplary performance, behavior, or merit. Spot awards and lump sum were similarly used on a similar low scale in both groups, peaking at just over 10% of cases, Figure 23. However, the use of these rewards differed; lump sums were slightly more applied by innovative companies, 9% for directors, and 11% for managers and supervisors, and administrative and technical employees, and, on the contrary, spot awards showed scarcely less use by innovative companies than the traditional. 9% of the innovative companies used it for managers and supervisors, administrative, technical, and operational employees, and 6% for directors. Among traditional companies, 12% used it for administrative, technical, and operational employees, 11% for managers and supervisors, and 8% for directors.

Figure 23: Occasional merit variable remuneration: spot awards and lump sum.



Source: designed by the authors.

The differentiated use of variable remuneration for executive and operational employees, in a much higher frequency for directors, followed by managers and supervisors, implies that there may be an exclusive approach for executive talent management and retention, especially in innovative companies. There was a significant difference, a 10% to 29% higher use than in traditional companies, in the use of half of the variable remuneration practices for directors and in two practices for managers and supervisors, being the executive bonus the most relevant. Profit sharing was the only practice with a significant positive difference for administrative, technical, and operational positions. At the same time, commission and awards had a significant negative difference for this group and managers and supervisors, as shown in Table 14.

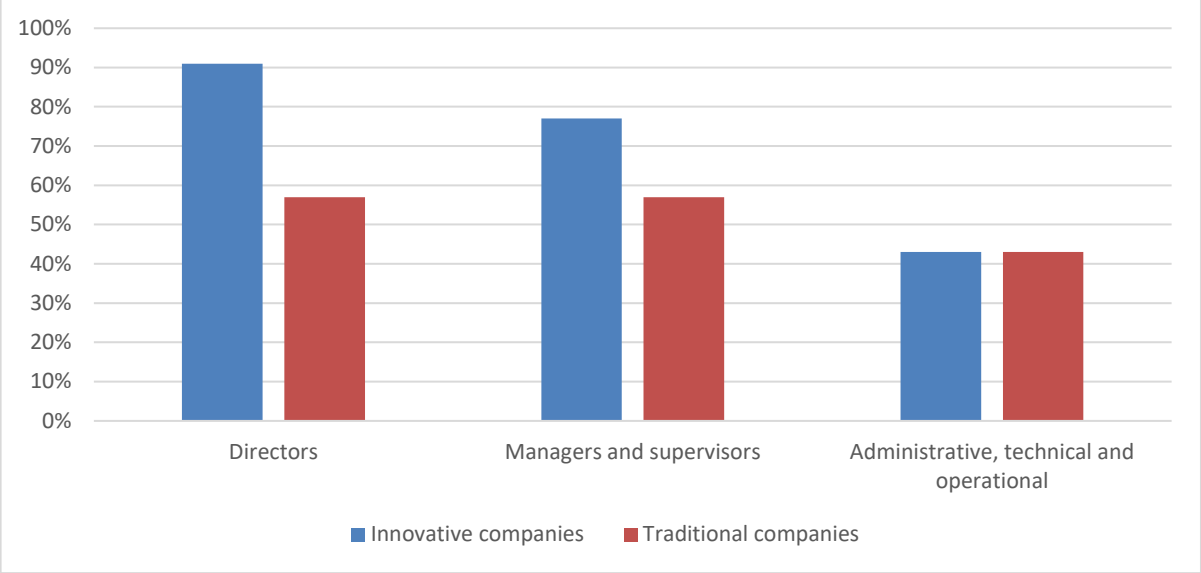
Table 14: Innovative companies' use of extrinsic rewards for various positions.

Extrinsic rewards	Directors	Managers and supervisors	Administrative, technical and operational
Executive bonus	**69%**	**49%**	6%
Profit sharing	66%	74%	**89%**
Shares distribution	**40%**	17%	8%
Stock options	**40%**	17%	9%
Hiring bonus	**37%**	**31%**	11%
Deferred bonus	17%	6%	0%
Retention bonus	17%	14%	3%
Lump sum	9%	11%	11%
Spot awards	6%	9%	9%
Commission or award	3%	9%	17%

Source: designed by the authors.

Innovative firms tend to use extrinsic rewards exclusively for executive positions, according to Shaikh & O'Connor (2020). The analysis of the use of at least one variable remuneration, except for profit sharing, as this is usually a reward more focused on non-leadership positions by companies from both groups for the three types of positions, revealed that this might be partially true, shown in Figure 24. 91% of the innovative companies affirmed to use of variable remuneration for directors, and 77% for managers and supervisors, while non-leadership positions received such rewards in 43% of the cases in both groups, which is less than half of its use for directors of innovative companies. In traditional organizations, 57% use extrinsic rewards for directors and for managers and supervisors, a 34% difference from innovative companies for directors and 20% for managers and supervisors. In other words, innovative organizations utilize variable remuneration practices much more intensively for leadership positions, and the higher the position in the hierarchy, the greater its use. Whereas traditional companies use extrinsic rewards less sharply for leadership positions than innovative companies and equally for non-leadership positions.

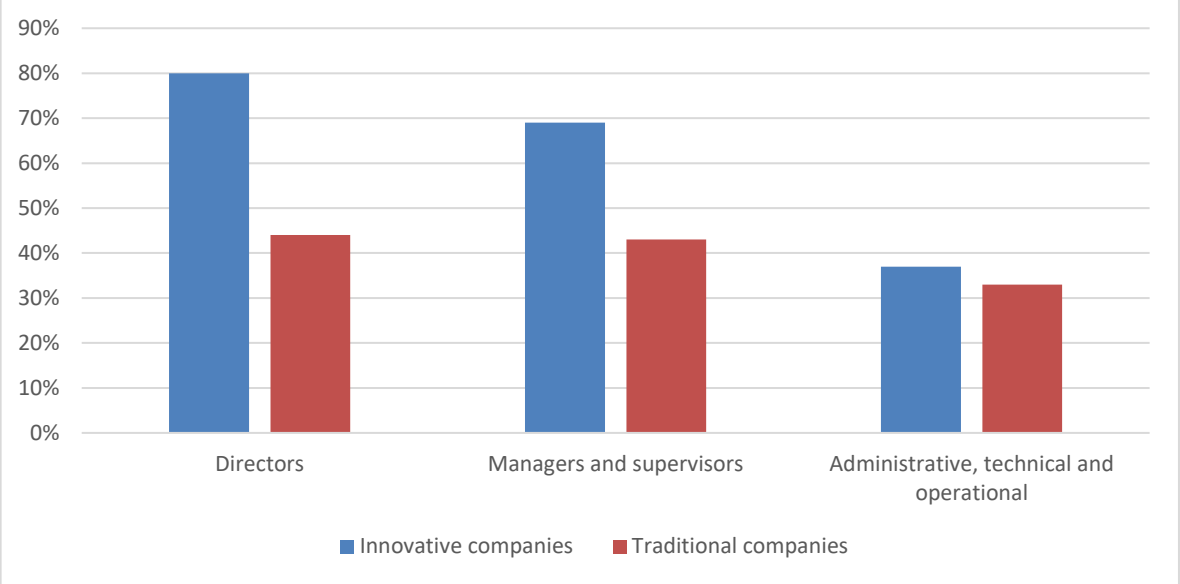
Figure 24: Variable remuneration usage by positions in innovative vs. traditional firms.



Source: designed by the authors.

Aagaard & Andersen (2014) and O'Connor et al. (2018) advocate that the mutual use of team-based assessment and performance financial rewards can stimulate employee innovative behavior. An analysis of the database revealed that 80% of innovative companies use both collective evaluation practices and performance-related variable remuneration for directors, 69% for managers and supervisors, and 37% for administrative, technical, and operational positions, as seen in Figure 25. Fewer traditional companies claimed to use both practices than the innovative group, with over 44% for directors, managers, and supervisors and 33% for non-leadership positions.

Figure 25: Mutual use of team-based evaluation and performance financial reward.

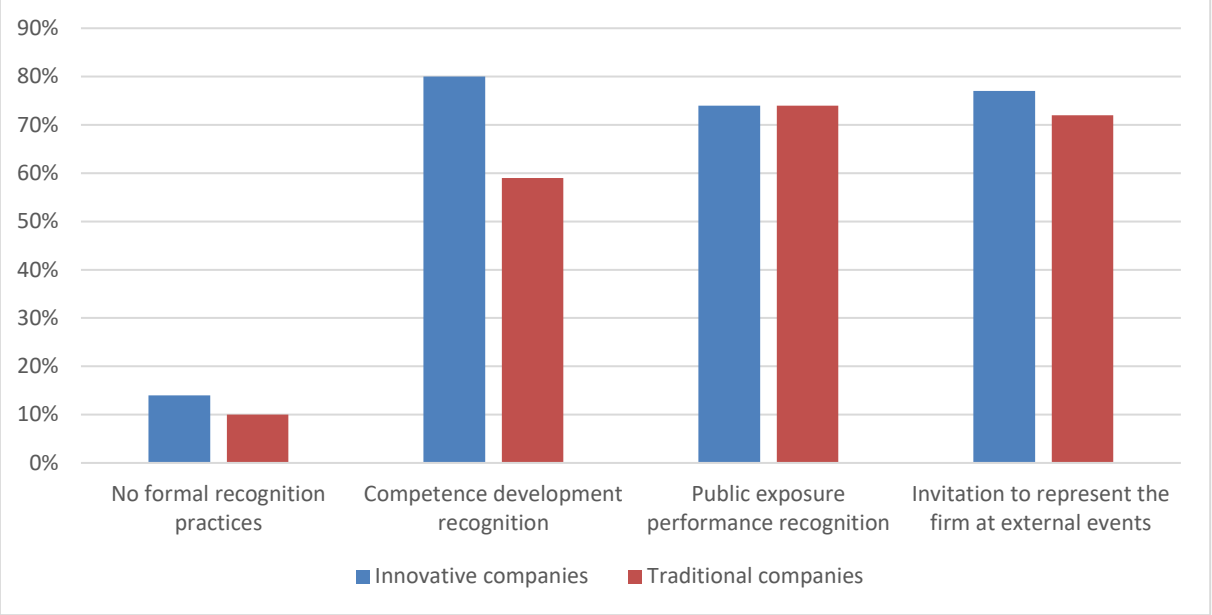


Source: designed by the authors.

The non-financial recognition practices, intrinsic rewards, were formally adopted by 90% of traditional companies and 86% of innovative ones, as shown in Figure 26. The organizations considered innovative presented the recognized competences development 21% more than the traditional group, being this practice applied by 80% of the innovative firms and 59% of the traditional cases,

Employee performance was rewarded through public exposure and invitations to represent the company at external events, similarly by innovative and traditional companies, in about 75% of cases.

Figure 26: Non-financial recognition practices.

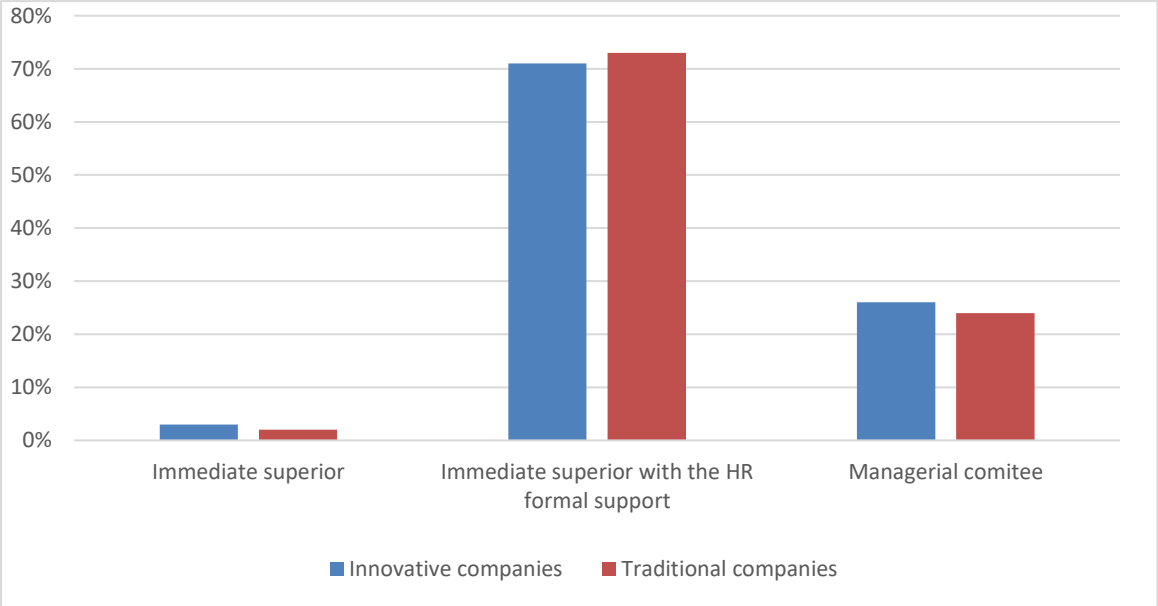


Source: designed by the authors.

6.2.2.3 Development

Concerning employee development, the formal criteria for decision-making aimed at promotions were analyzed. The activities of innovative and traditional companies were very similar. In the innovative firms, decisions about promotions were taken mainly by the immediate superior with formal support from HR in 72% of the cases; followed by 26% of the organizations where the development decisions are a managerial committee responsibility, as shown in Figure 27. This result indicates a predominant use of formal organizational career management when career development is promoted by the company, contributing to employee retention by offering formal forms of growth (de Vos & Dries, 2013).

Figure 27: Decision-making about development and promotion.



Source: designed by the authors.

6.2.3 Discussion

The literature showed that strategic innovation is driven by highly skilled, knowledgeable individuals and talent management is a structured way to work with human capital (Aagaard & Andersen, 2014). The development of talent management can help innovative companies to make strategic innovation a lasting organizational capability (O'Connor et al., 2018). Companies can retain talents in innovation through employee development, assessment, and reward systems (Aagaard & Andersen, 2014; Kong et al., 2013; O'Connor et al., 2018). HRM has been shown to have a more exclusive and organizational approach when applied to strategic innovation (Fowinkel, 2014; Hebda et al., 2012; Marvel et al., 2007; Marx et al., 2016).

The comparative analysis of the GPTW 2017 database, which had their HRM practices recognized by the Brazilian GPTW award and was divided between the groups of innovative companies, as they were also awarded the Brazilian *Valor Inovação* prize in the same year, and traditional companies, allowed the identification of the talent management practices most used by innovative and traditional companies to retain employees and the differences in the use of these practices between the two groups of organizations.

The talent management practices used by more than 80% of the innovative companies and that differed by more than 20% from the traditional organizations are presented in Table 15. These represent 52% of the analyzed practices. The table with all analyzed data can be found in Appendix D.

Table 15: Talent management practices in innovative and vs. traditional companies.

	Practices	Use in innovative firms	Difference from traditional firms
Evaluation	Mutual use of team-based evaluation and performance reward for directors	**80%**	**36%**
	Results are used on remuneration decisions	**100%**	**22%**
	Collective goals with different areas	**94%**	18%
	Employee participation in the definition of goals	**94%**	15%
	Goals derived from the strategy	**100%**	5%
	Results are used on career development decisions	**97%**	13%
	Employees are evaluated by their immediate superior	**97%**	0%
	Self-evaluation	**91%**	9%
	Results are used on training and development decisions	**91%**	-2%
	Goals consistency with indicators awareness	**86%**	10%
	Employees are evaluated by the chief of their superior	46%	**27%**
	Mutual use of team-based evaluation and performance reward for managers and supervisors	69%	**26%**
Rewards	Use extrinsic rewards exclusively for executive positions - Directors	**91%**	**34%**
	The company remunerates in relation to the market	**94%**	11%
	Profit sharing - Administrative, technical and operational	**89%**	13%
	Uses formal assessment tools for incentive purposes	**83%**	1%
	Establishes a maximum percentage for salary increases based on merit or promotion	**80%**	17%
	Executive bonus - Directors	69%	**29%**
	Share distribution - Directors	40%	**24%**
	Stock options - Directors	40%	**24%**
	Use extrinsic rewards exclusively for executive positions - Managers and supervisors	77%	**20%**
	Executive bonus - Managers and supervisors	49%	**20%**

Source: designed by the authors.

Innovative firms tend to use their HRM systems strategically, mainly focusing on evaluation and reward practices. In addition to the GPTW database presenting less data to be analyzed about development practices, none reached the mentioned parameters. There was only one practice with greater use in innovative companies between the development practices. In 71% of the cases, decisions about promotion were made by the employee's immediate superior with formal support from HR, which indicates the existence of formal procedures in the organization (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017). None of the development practices stood out from the ones used by traditional firms.

The evaluation practices that detached both for their wide use by innovative companies and for their differentiation from traditional organizations were:

(1) the mutual use of team-based evaluation and performance reward for directors or leadership positions: its use for managers and supervisors was also very differentiated from innovative companies, but with a minor usage, the concurrent use of these two practices can stimulate employee innovative behavior (Aagaard & Andersen, 2014; Farouk et al., 2016; O'Connor et al., 2018);

(2) the use of evaluation results on remuneration decisions: scholars claim assessments' outcomes are used in decisions concerning salary, promotion, and training (Katou & Budhwar, 2010; O'Connor et al., 2018);

(3) the use of collective goals shared with different areas on assessment: objective assessment for strategic innovation employees should have aligned metrics with the areas participating in the project (Marx et al., 2016); and

(4) the employee participation in the definition of goals: it is aligned with what was observed by the literature that strategic innovation employees tend to proactively define their own metrics to be assessed and pass them for HRM to execute (Aagaard, 2017; Fowinkel, 2014), and the argument that objective assessments for strategic innovation employees should focus on what is under the individual's control, with adjustable indicators linked to innovation activities (Marx et al., 2016; O'Connor et al., 2018).

An assessment practice that contrasted innovative companies to the traditional, even not having such intense use in innovative companies, was:

(5) the participation of the chief of the employee's direct superior on performance appraisal: this practice can be beneficial for strategic innovation positions that work more closely with the TMT since it is advocated that the development of a strategic innovation capability involves senior executive's formal and direct involvement and support (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016), and the visibility given by the contact of strategic innovation employees with individuals in higher positions of the organization may promote their career development (Fowinkel, 2014; Kelley et al., 2011).

One reward practice excelled for its broad utilization in innovative companies and for differing from traditional firms' use:

The exclusive use of variable remuneration for leadership positions, especially for directors: Shaikh & O'Connor (2020) observed evidence that innovative companies tend to use extrinsic rewards exclusively for executive positions, relegating intrinsic incentives to other positions. This evidence is reinforced by the data that the rewards practices that differed the most in use between innovative and traditional companies were aimed only for leadership positions: executive bonuses for directors and managers and supervisors, share distribution for directors, stock options for directors, and exclusive use of variable remuneration for managers and supervisors.

Reward practices widely used by innovative companies, but to a similar extent by traditional companies were related to the provision of a remuneration that is compatible with the market, what is expected among firms awarded as the great place to work, extensive use of profit sharing for administrative, technical and operational positions; the use of formal assessment tools for incentive purposes; and an establishment of a maximum percentage for salary increases based on merit or promotion, which may be related to the existence of formal and structured organizational-level HR procedures.

Accordingly, it was concluded that most of the used practices indicated an exclusive approach. Most practices utilized by innovative companies were related to the employees' performance appraisal, and innovative companies extensively use

more assessment and rewards practices to retain employees. However, the use of financial rewards for non-leadership positions is much lower than for leadership roles. While the use of development practices was low and similar to the traditional companies.

The verified results obtained from this study played a pivotal role in providing guidance for the research protocol and facilitating the qualitative analysis utilizing conducting in-depth case studies. These results served as a foundation upon which the research methodology was designed and implemented, enabling a comprehensive exploration of specific cases to gain a deeper understanding of the subject matter.

It is necessary to emphasize that, despite having analyzed the HRM practices of innovative companies, the GPTW survey aims to map the HRM practices used for the whole company's employees without distinguishing those who work with innovation from those who do not. This limitation is due to the use of secondary data, which also restrains the results to the awarded companies, recognized as having the best HRM practices and being more innovative in one specific year, which may not reflect the Brazilian reality based on this unique and small universe of organizations. Besides, there may be, among the traditional group, companies that develop innovation but did not appear in the 2017's innovation rank for not participating in the survey or not being awarded in that year.

7. RESULTS AND DISCUSSION

The literature investigation showed that an organization's innovation capacity is closely related to the employees' capabilities and motivation. However, some HRM practices may conflict with the intrinsic characteristics of strategic innovation, generating a career risk perception. Innovative established companies can benefit from the presence of strategic innovation employees at various hierarchical levels and the TMT members experienced in strategic innovation, especially if they have varied backgrounds. However, innovation leaders find it challenging to reach such positions. Using talent management for strategic innovation employees can help innovative companies overcome such obstacles and make strategic innovation a lasting organizational capability.

The empirical qualitative and comparative investigation of multiple cases intended to detail the practices used by innovative Brazilian companies once the HRM's talent management and retention constructs emerged as applicable to innovation leaders; and to deepen the understanding of HRM systems used in Brazilian companies that develop strategic innovation through the qualitative. The results and discussion of these analyzes are presented below.

7.1 PHARMACEUTICAL COMPANY

Historical data prior to the creation of the innovation unit obtained from LGI's research documentation showed the pharmaceutical company's organization concerning innovation prior to the creation of the innovation unit. The data was collected in April 2012 in a meeting with R&D Manager A1.

Until 2010 the company did not have a structured innovation unit. In 2008, there was a milestone in the reorganization of the company's R&D activities through a reanalysis of the internal structure, partnerships, legal support, and rules regarding financial resources. Innovation proposals began to demand structured business plans and specific valuation criteria for their approval and continuity. The R&D team carried out strategic innovation projects, and the projects' secrecy was a concern. The launch of a patented new product which represented a new path for medical treatment and had significant repercussions on the company's positioning motivated the

systematization of strategic innovation development and the creation of a strategic research center.

The creation of compounds for strategic innovation projects integrated a complex and lengthy process with an average duration of 8 to 12 years. The organization's innovation portfolio had 12 projects of incremental and strategic innovation. Their classification of a drug as a strategic innovation observed whether its performance could reach certain levels of market impact throughout its development, accumulating the acquired knowledge since the beginning of its development and enabling predictions of ranges of variation associated with probabilities.

The company's strategic target was pathologies related to age-related diseases, especially those associated with the central nervous system. However, there was the possibility of incorporating other ideas that presented good possibilities of financial return to this strategy target, depending on the investment required. Thus, maintaining investments with no guarantee of success required the company the definition of clear long-term objectives and stability in decisions, being the shareholder return a decisive evaluation criterion. As the pharmaceutical industry's performance is closely associated with patent registration, it is common to know what investments in innovation are being made by competitors, which makes competition in innovation quantifiable.

In 2012 the pharmaceutical company was led by an internally selected CEO, who was previously the executive responsible for the strategy, development, and finance areas. From the beginning of 2013 until the end of 2014, the company was managed by a committee of three executives, supported by the chairman of the board of directors, without a CEO. Then CEO A1 was externally hired from the packaging sector. He held some experience in innovation early in his career. The development of strategic innovation was allocated to the R&D department, which faced integration difficulties with other company areas. During CEO A1's tenure, from 2014 to 2017, there has been a more specific focus on strategic innovation, the perception that strategic innovation required a specific area, and its creation in 2015. At the beginning of data collection in 2017, Innovation Director A2 emphasized that the organization's turning point for the development of strategic innovation projects was the support of CEO A1 in "making strategic innovation part of the company's strategy". According to Innovation Director A2, strategic innovation was the second most important pillar in

Case A1's strategic planning, and two of its consequences were: accelerating strategic innovation and structuring strategic innovation.

The initial team involved in the strategic innovation projects was multidisciplinary and highly qualified, using state-of-the-art equipment. The innovation structure comprised one director, one manager, and four senior analysts. Their roles were determined by the type of activities they performed. Analysts and junior analysts were allocated between the development of strategic, incremental, and new business activities based on the demand.

The R&D area employed about 20 people. About 90% of the activities were carried out in external science and technology institutes, where external researchers participated in the development of innovations associated with their research and were managed by the company's R&D team. The prospection of partnerships occurred informally and was based mainly on the strategic innovation employees' personal and academic networks and participation in congresses. The company also invested in business partnerships of different natures and joint ventures.

By then, according to R&D Manager A1, the formalization of processes was a key factor for the assertiveness of decisions. As the pharmaceutical sector is intensive in scientific activities, several practices associated with innovation programs were common to R&D, such as partnerships with universities, patent management, and technical prospecting. Despite the structured development processes, the R&D area saw the formalization of opportunities, in the case of discovering unexpected properties of compounds in tests, as a possibility to convert them into a new project which, after the elaboration of its plan and approval, if further exploration of the opportunity was convenient, or wait for a favorable scenario, could be developed.

Strategic innovation opportunities were evaluated in bimonthly meetings, in which three possible scenarios were presented. In the most pessimistic scenario, a project's expected return was 2.5x the amount invested. All business plans were fully reassessed annually. The patent portfolio was continuously analyzed, and some projects could be canceled based on business convenience.

R&D Manager A1 reported the great value attributed to professional experiences and staff training, with a significant problem being identifying good profiles of professionals to work with R&D in Brazil. There was an incentive for academic

development and business-related areas. Therefore, there was a strong demand for forms and strategies for developing and retaining talents. Nevertheless, R&D Manager A1 left the company a few months after the interview to work at one of the partner companies of the pharmaceutical company, the joint venture created with the government and three other competing pharmaceutical companies.

The performance appraisal practice was aimed at positions from senior-level analysts, being the metrics related to the budget and schedule of the projects. The evaluation was strongly linked to the variable remuneration, with a 15% tolerance of the predicted targets for these two variables. There was no loss of incentive or punishment related to the success or failure of projects.

7.1.1 Case A1

The Strategic Innovation Unit of Case A1 aimed to develop new pharmaceutical assets from discovery to pre-clinical phases based on pre-defined innovation strategic targets and unattended needs mapped in the market that drove the innovation focus. The Strategic Innovation Unit's projects were long-term and required particular expertise. They pursued the discovery of new molecules, called Drug Discovery, which could be destined for new markets that required the development of new technologies.

Some examples of the presented strategic targets were treating diseases in great demand that still did not have an established pharmaceutical solution, creating new lines of business, reducing the number of doses of a well-established medicine, and making existing businesses more accessible to overlooked markets. However, in the case of discovery of new molecules with the potential for a new market target between the discovery and development stages, changes were made in the development of the new molecule to enable its development.

Strategic innovation projects underwent two major stages of development in the Innovation Unit, discovery and development. The Strategic Innovation Unit was primarily linked to the discovery stage. In general, projects took 10 to 15 years to go through these two stages, with 2 to 4 years in the discovery stage, a long duration. By 2018, there were 23 projects in the strategic innovation portfolio pipeline, from a total of 153 innovation projects, and more than R$80 million were invested in innovation. According to Innovation Director A2, one or two strategic innovation projects were

launched to the market, and asserted that the organization was already capturing the results in two years.

In the early discovery stage, linked to the synthesis of molecules, from 2% to 8% of the investigated molecules proved to be potentially viable. According to Innovation Manager A2, “out of every 10,000 compounds that enter the discovery phase, 250 reach development, five reach Phase I, and one reach the market”. While the projects in the late discovery phase, linked to the safety of the molecules, were sent to development once that safety was assured. According to Innovation Manager A1, it involved transitioning from basic research to applied research, with really high levels of uncertainty and projects still impossible to value. He affirmed that “uncertainty walks with us.” The low probability of continuity of the molecules to move forward as innovation opportunities indicated a high rate of uncertainty and failure in the projects.

As the company had a solid strategic intent, long-term projects with a high rate of discontinuity and changes, and the potential to create new lines of business, the projects can be considered strategic innovation with high uncertainty.

Case A1’s strategic plan was driven by the company’s growth, innovation, operational excellence, customer focus, and sustainability pillars. The strategic innovation strategy was based on well-established targets focused on new molecules with market potential. It might also incorporate technological directions of pharmaceutical leaders guided by monitoring competitors’ portfolios. Thus, a close relationship was identified between the strategic innovation portfolio and the company’s strategic intent.

The Strategic Innovation Unit comprised 5% of human capital, 15% of the project portfolio, and 30% of the budget of the Innovation Unit. The budget was distributed over the years of development of strategic innovation projects.

The Strategic Innovation Unit’s processes were formalized, having guaranteed resources for the discovery phase of strategic innovation projects. When strategic innovation projects achieved the development phase, resources were allocated to the projects and became the Project Management Office’s (PMO) responsibility, which was part of the Incremental Innovation Unit. The strategic innovation project’s resources were distributed by the PMO over the time of its development, facilitating acceleration. “To work on the initial development process, a very robust process was

established, with clear criteria for acceptance and approval of these projects, through the formalization of a multidisciplinary technical evaluation team, and the acceleration of the decision-making process, which was a Case A1's weakness", reported Innovation Manager A2.

Before the creation of the early development manager position, held by Innovation Manager A2, the initial development management that passed strategic innovation projects that were leaving the discovery phase and entering the development phase, the projects' coordinators or managers led the strategic innovation projects from the discovery phase to final product development. For him, this practice was not sustainable with the growth in the number of projects. The creation of the early development manager position aimed to build an integration program for the strategic innovation projects so that all areas involved in their development process in the company could visualize and understand them in detail.

There were formal committees on strategy and innovation led by the board of directors and on innovation directed by the executive body. The executive innovation committee included all the TMT members, occurring monthly. An alignment meeting was conducted before the innovation committee involving the innovation and marketing directors. The innovation committee evaluated two or three strategic innovation projects, and the financial evaluation started in Phase II of drug development. "If a good candidate appears and we decide to work on its intellectual property, it is ready for development. Then, we can start valuing, and the uncertainties slowly begin to decrease. But there is no complete certainty until the end of the process", asserted Innovation Manager A1. The innovation portfolio projects were allocated according to their budget; projects of up to R$ 3 million use the resources of the innovation department, and those above that amount must be approved by the innovation committee. Projects are evaluated in terms of their marketing potential and viability.

The organization in Case A1 understood that uncertainties were inherent in strategic innovation projects. This awareness occurred after a maturity process of its strategic innovation capacity, "the organization had remarkably high expectations of strategic innovation projects and practically ignored the involved risks. The company expected that all its projects in the strategic innovation pipeline would reach the market. It took a long time to make the company aware that these projects die naturally during the development process and the importance of canceling them. Today the company

expects that only projects with a great degree of innovation, the possibility of reaching a large market, and great technical quality go to the development phase", reported Innovation Manager A2.

Therefore, discontinued strategic innovation projects went through a series of decision-making processes in which all the company's technical areas needed to be in agreement. "Once a consensus is reached, I need to present it at the innovation committee meetings. The project is only canceled when it is effectively registered as a discontinued project in the meeting minutes", asserted Innovation Manager A2. However, after the discovery phase, a project was discontinued only in case of external factors linked to feasibility, which rarely occurred. Hence, given this long formal decision-making process for project discontinuation, it did not impact any strategic innovation employees' careers. Innovation Manager A2 stressed that "we always formalize a document of lessons learned from the failure of that project. And then, we try to incorporate these lessons learned into our day-to-day process. But we never point out names, not even the name of the area where this project failed".

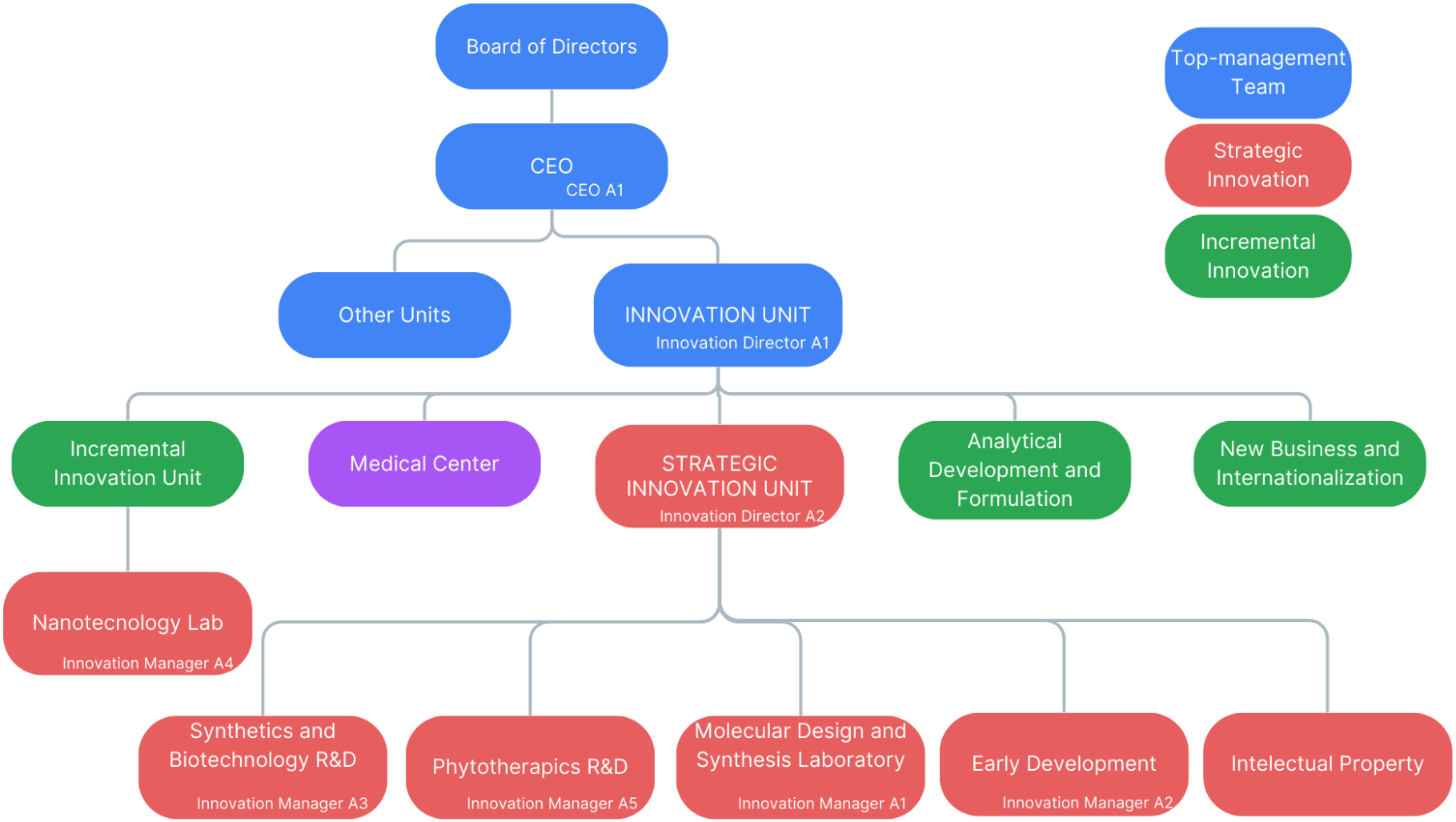
7.1.1.1 Structure

Case A1 had a formal Strategic Innovation Unit within the Innovation Unit, where it was integrated with Incremental Innovation, Analytical and Formulation Developments, Business Development, Alliances and Internationalization, and Medical-Scientific areas. The Innovation Unit employed around 330 dedicated professionals, being 17 positions placed in the Strategic Innovation Unit.

The Strategic Innovation Unit encompassed three laboratories directed at molecular design and synthesis, synthetics and biotechnology, and phytotherapics, besides an early development and intellectual property area. In addition, a nanotechnology lab, which developed strategic innovation, was observed in the Incremental Innovation Unit.

The Innovation Unit, led by Innovation Director A1, was in the highest possible hierarchical position within a functional unit, reporting directly to the CEO, as seen in Figure 28. This indicates the TMT's formal and direct involvement with strategic innovation but not the presence of a CIO position, as Innovation Director A1 held both strategic and incremental innovation management roles.

Figure 28: Case A1’s organizational structure.



Source: designed by the author.

7.1.1.2 Senior leadership

Case A1 was initially led by CEO A1, whose profile was discussed in Section 7.1. In 2017 there was a change in the CEO's position. CEO A2 was internally promoted from the Executive Director of Commercial & Business position after nine years of work in the company. CEO A2 graduated in Business Administration with a specialization in the same area. Throughout her career, she worked for eight years in the marketing area of large food and retail companies, with a three-year experience in the financial area. She joined the pharmaceutical company in the strategic planning area, where she stayed for one year before being promoted to executive commercial director and becoming CEO. Thus, CEO A2 most likely did not have experience with innovation projects. Her functional knowledge was based on commercial and financial areas focused on short-term deliveries and a brief passage through the strategy area.

Innovation Director A1, who held the Innovation Unit's executive position, has a degree in Pharmacy, a specialization in Marketing, and an MBA in Business, Management, and Finances. He worked for six years in sales, where he started his career, followed by 12 years in product and business development, 8 of which in the pharmaceutical company, where he claimed to have launched more than 100 products on the market in his LinkedIn profile. He was promoted to Head of Innovation & Business Development after serving for a year as director of Business Development, Alliances, and Internationalization for the pharmaceutical company, a position which he continued to perform after the promotion. Even though he has worked with project management, the presented voluminous number of launched products indicates that he possibly had no contact with strategic innovation projects before becoming director of the innovation area. Therefore, the executive position linked to innovation in Case A1 had varied functional knowledge and competencies but most likely did not have strategic innovation expertise.

The involvement of the TMT with strategic innovation projects also occurred through the innovation committees and integration initiatives between the different directorates: "We have held weekly meetings between all directors. As one of the results, everyone feels like they own strategic innovation projects", affirmed Innovation Director A2. The frequent involvement of all business units with strategic innovation projects through innovation committees allowed cognitive diversity regarding the resolution of problems and uncertainties related to projects, considering the ambiguous

impacts of the committee's decisions. However, it is possible that the defending and legitimizing strategic innovation projects' role was performed by the Innovation Director A2 and strategic innovation managers, not by the Innovation Director A1, as expected.

The TMT was also involved in generating ideas for innovation. Opportunities from directors and strategic innovation employees were taken to the meeting of directors of the Innovation Unit. If approved, they went back to formulate a structured project that was forwarded to the board for approval.

Innovation Managers A2 and A5 stated that they participated in the innovation committee meetings through monthly presentations of projects of their areas. Innovation Manager A3 participated in the committee that defined the company's strategic innovation targets. Innovation Manager A4, who was responsible for the nanotechnology laboratory in partnership with a European company, stated that "we have meetings twice a year with the CEO A2 and the R&D VP of the international company" in which the most important decisions over projects, investments, and the number of employees allocated to each project. This contact between strategic innovation managers and the TMT enabled them the visibility that could lead to their career development.

7.1.1.3 Roles and positions

About 18 employees working directly with strategic innovation were identified in the Innovation Unit, one of them allocated in the Incremental Innovation Unit. Besides Innovation Director A1 and A2, there were two managers, four coordinators, two senior analysts, five analysts, one junior analyst, and one auxiliar, with two vacant junior analyst positions. Case A1's strategic innovation team was formed by a small group of individuals positioned through diverse hierarchal levels of the organization. However, there was no indication of cross-functionality since they all were pharmacists, most with master's and PhD degrees.

To perform the existing roles to work with strategic innovation, Case A1 sought a technical profile in areas related to pharmacy, chemistry, and biology, with degrees ranging from undergraduate to PhD and postdoc activities. Among the Strategic Innovation Unit's leadership positions, it was noted degrees starting from master's, but

the majority with PhD, and three did a postdoc. This profile did not apply to the analyzed TMT members' profiles of the organization.

The strategic innovation managers, perhaps due to their academic profile, showed great familiarity with the radical innovation management literature from the beginning of the data collection, even using the area's terminologies in the Strategic Innovation Unit.

The identified strategic innovation management roles were:

- Innovation Director A1: executive innovation leader;
- Innovation Director A2: strategic innovation manager, a senior technical manager who directly led the strategic innovation managers;
- Innovation Managers A1, A3, A4, and A5: opportunity domain leaders, which operated at the discovery phase, dealing with opportunity platforms;
- Innovation Manager A2: new business creation specialist, took opportunities from the discovery portfolio to the incubation phase. He reported to both Innovation Director A2 and the director of the scientific medical center of the Innovation Unit.

HR Manager A1 identified in Innovation Director A2 a greater focus on people development than the other Innovation Unit directors "as he has that view, the people below him have also developed this ability. Therefore, I understand there is a concern with developing and training professionals besides giving feedback to the teams. For example, today, we have not structured the model of giving feedback to the teams; they are given only to the coordination level. And I know he has this practice in the Strategic Innovation Unit. I do not know if he brought a cultural aspect from previous experience or the smaller number of employees that enables his time availability to do this".

7.1.1.4 HRM practices

Talent management

Since the first meeting, the strategic innovation team reported that it had recently detected a need to develop HRM practices aimed specifically at the Strategic Innovation Unit. In addition, the strategic innovation managers reported they were

having difficulty in their requests for the creation of a specialist career from HRM, which already existed for other areas of the company. Their expectation with this demand was to feel valued and have opportunities for growth in the organization once there were few possibilities of promotion within the Strategic Innovation Unit.

The Innovation Manager A1, placed in a coordination position, when asked about career prospects within the company, replied: “today I answer directly to the strategic innovation director, then the career is moving in that direction”, which showed a perspective of traditional career development, in which one focuses on the steps of the organizational structure of the company. The Innovation Manager A2 pragmatically responded along the same lines “there is a next step which is what we call a divisional manager. It would be an executive manager, which would be my next career step. This next step requires solid management experience to reach this level, and it can happen more quickly if an opportunity arises, in the case of Innovation Director A2 going to another company”, which happened in Case A2, “it may be that I or another manager in the area will be promoted to divisional manager, already as a form of preparation, which would take around two years. What I perceive is that, if an opportunity does not appear or is not very evident, this change of position usually happens after about four years in which the person is in a departmental position”.

Hence, there would be a single position for promotion to which all strategic innovation leaders, peers from the same small team expect to compete as possible successors in case of vacancy. However, even in the absence of promotion opportunities, there were chances for salary increases based on merit as a recognition of the work performed. When the salary got close to the subsequent income level, the HRM recommended the promotion.

Then, the strategic innovation team perceived a specialist career as a possibility of development within the Strategic Innovation Unit. The Innovation Manager A1 added that “we are also developing a new project that is the specialist career, which is precisely for researchers to grow in a parallel career path”, which indicated a proactive search for an internal development alternative that could benefit all strategic innovation leaders and impact their retention. She justified and stressed that “the innovation areas are a little different from other areas of the company. It has been constant work, together with HRM, and the company, to show that it is important for us to have very specialized people in the strategic innovation team and that we need to develop and

retain these talents. This has become noticeably clear since the opening of the synthesis and nanotechnology laboratories and the creation of the Innovation Unit. Thus, we have been insisting a lot on the design of a specialist career, that it is important for this employee profile to have a differentiated growth path in the company".

Nevertheless, Case A1 did not distinguish this need for alignment between innovation strategy and the HRM systems, adopting an inclusive approach throughout the company. In other words, the same HRM practices were used for all non-executive employees.

Innovation Manager A4 emphasized the need for intrinsic recognition in professional appreciation. "The company has the capacity to value their employees. I just got back from Europe with my director, and we were talking about the importance of having our own event, like the one we saw at our partner company, an event where we could unite everyone from the Innovation Unit to do brainstorming, motivational speeches and keep our intuition and creativity, that I believe are particularly important characteristics for anyone who works with innovation".

The company's 2018 annual report cited the identification of talents and preparation for undertaking new challenges, development, and succession plan based on competencies, management curriculum, trainees, and interns. The talent management practices mentioned above were predominantly related to the organization's salesforce, and management positions, endorsed by a high internal promotion rate, but it did not mention innovation positions.

Still, Case A1 conducted an annual innovation program that aimed to stimulate employees to generate ideas that could contribute to the business. Innovation Manager A4 described this program as "a selection process where a person submits a project that is voted by a commission and, if the project is approved, the individual can develop this project in the company, and choose an award within an established amount, that can be a travel, goods, and other things. This process can provide a lot of visibility, generating several opportunities for growth".

Evaluation

Case A1's evaluation process was applied annually, with half-yearly reviews, quantitatively, through milestones, and qualitatively based on corporate and functional

competencies. The company's strategic plan execution was monitored by indicators, incorporated into the leaders' annual goals, and cascaded from directors to managers and coordinators at the individual level. The performance and competence evaluations were performed for managerial positions. Executive positions, such as TMT members and directors, were evaluated only by goals, but teams were not evaluated. The goal achievement conditioned the payments of the profit sharing for all employees. The Innovation Manager A1 stated that "the process is the same for all managers in the company. There was always this internal questioning whether it is the best form of evaluation or not, but we do not have a different system for the innovation area ".

In the quantitative assessment, it was verified whether the leader and the team reached the proposed goals. The targets were related to strategic innovation projects, such as reaching milestones within each project or proposal. Three to five goals were defined using the SMART methodology (Specific, Measurable, Achievable, Relevant, and Time-bound), and the weight of each target was stipulated by the employee and approved by their immediate superior. The goals can be classified in the evaluation system as linked to strategic projects or the delivery of results for the company, for example. The scores assigned to the goals are distributed by quartiles, with a 4-score achieving 100% of the target and 5-score being overcome.

Given the uncertainties linked to strategic innovation projects, Innovation Manager A2 reported that he estimated what was likely to be a desirable result, for example, "given a target of assertiveness of the schedules of projects that are in the development phase. A delay, a change, a cancellation of a milestone is already expected. Then, if I pass 85% is already well above the target of development projects and If I achieve over 90%, as this is very rare to happen, I will be able to score 5." Innovation Manager A1 explained that "as each project proceeds differently, there are more advanced projects, less advanced projects and projects that will still enter our pipeline of projects." Thus, the goals were established by managers based on these milestones, which differed for each project. The half-yearly review of goals allowed the metrics to be adjusted with the superior in case of any change of course or closure of a project. This possibility of realigning the goals reduced the impact of project uncertainties on the results of the manager's assessment and, consequently, on the perception of career risk. Hence, the strategic innovation area defined its own metrics

to be used in the evaluation process, focusing on what was under the individual's control with adjustable metrics.

However, the disclosure of targets could be delayed in Case A1. According to Innovation Manager A5, targets were divulged "generally in the month of April or May, but always referring to the entire year. The goals were established for the period from January to December. In December, their achievement is verified, I do not know if it is the best way. But, as they are hired already with 4 or 5 months of activities in the year, we manage to be much more assertive in their definition, because then we already know what we can achieve, the milestones of the projects and the goals". Hence, Innovation Manager A5 believed that there was no problem with the late establishment of goals, since "basically the budget is a marker of what we have to accomplish annually and then its description is a mere formality for HRM". Therefore, the budget can be considered to have a solid relation to Case A1's strategic innovation leaders' annual goals.

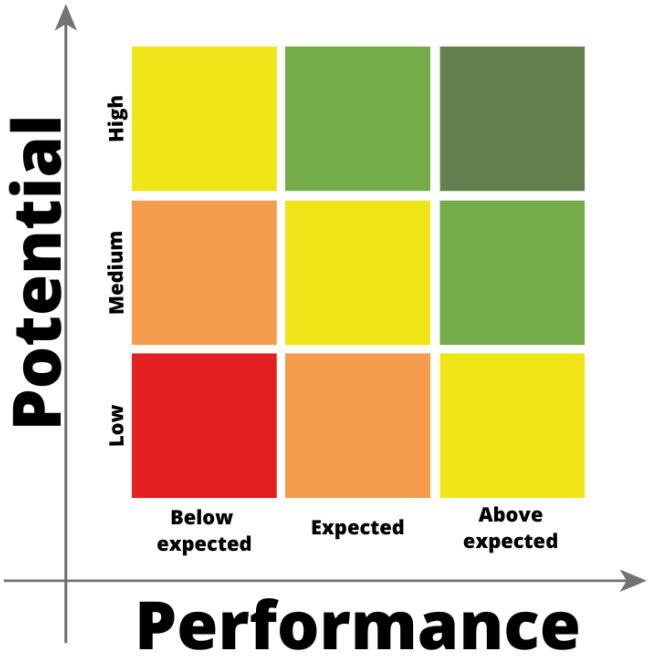
Case A1's qualitative assessment was 180 degrees and based on competencies, which were categorized within a 5-degree scale of intensity that varied between "does not meet" and "exceeds expectations" and indicated how much the individual was performing within that competence. About seven corporate competencies were expected from managerial positions in that area: team management, delivery of sustainable results, and systemic view of the business, for example. Nevertheless, the company was in a transition moment, aiming to unify these corporate competencies.

In the 180-degree evaluation, the individuals were assessed by their superiors, peers, and self-assessed, who used the same appraisal form. It was observed that Innovation Managers A2 and A4 were evaluated by two superiors, Innovation Manager A2, by the innovation director of strategic innovation and by the incremental innovation director of the Innovation Unit. At the same time, Innovation Manager A4 was assessed by the incremental innovation director and the R&D VP from his laboratory's partner company. The indication of peers to perform the evaluation was made by the employees and validated by their direct superiors. The results of this evaluation went through an HRM calibration committee that analyzed possible discrepancies between the results of the evaluators. The HR Manager A1 mentioned that, when evaluating a manager, all superiors from two hierarchical levels participated "all directors of the unit

evaluate all the coordinators who are part of it. When they are the core directors, I have the executive directors and the presidency". Therefore, the competence assessment used subjective criteria that were not based on innovation competencies. However, the overall assessment process promoted the visibility of the leader with positions at higher hierarchical levels.

The results of the evaluations were placed in the nine-box classification graph, which combines the analysis of the individual's potential and performance, allocating the employees according to their performance in the year, as shown in Figure 29.

Figure 29: The nine-box chart.



Source: designed by the author.

At the end of the evaluation process, formal individual feedback was carried out by the individual's superior. Then the employees included their understandings of the feedback in the evaluation system "in which I need to write what were the strengths and points to be improved reported about me. Then, I need to build an individual development plan for these enhancement aspects", detailed Innovation Manager A2. HRM then monitored the individual development plan. It allowed the identification of training opportunities, readings, and lectures to be provided by the HRM. The HR

Manager A1 added that the individual development plan entailed both actions that the person could do individually and collectively. “In collective actions, we have what we call a management development curriculum, which are several topics related to our competences and based on these topics people are invited to participate in trainings conducted by external consultants”.

There was a relationship between the results of the evaluations and the rewards received. However, it was within a general evaluation of the company’s goals at a macro level related to all areas. The only variance was the profit-sharing percentage for each level of position. Hence, rewards were not tied to the completion of projects or individual goals.

The HR Manager A1 advanced the HRM’s plan to use corporate targets cascaded from the TMT’s goals instead of the individual metrics. This change in the evaluation system was a concept introduced by CEO A2, “she believes much more in cascading the big goals. Because before, as each area created its goals, sometimes it was difficult to compare them”, asserted HR Manager A1. There would be three business goals and a goal called the specific challenge of that unit, which would be related to the person’s role. The challenge for the Innovation Unit would be “the number of launches that we will have in 2 years’ time”, she exemplified. The HRM considered that the Strategic Innovation Unit might not have a direct interface about this action, but “in some way, it will be impacted”.

Rewards

In addition to the profit-sharing concession, the innovation directors received a bonus every three years based on the length of their careers in the company. Also, there was a financial bonus for managers and coordinators who achieved the maximum score in the competence assessment, in the order of 50% of a salary once a year. However, there was an HRM budget restriction on granting this bonus, and, therefore, there was a rotation among the leaders of the Strategic Innovation Unit; each year, one of the managers or coordinators got this bonus.

Development

The possibility of a specialist career was initiated in Case A1. Until then, there were only very few growth opportunities in management for the Strategic Innovation Unit.

Innovation Manager A4 reported another developmental opportunity. He proposed an opportunity to his coordinator in 2016 concerning a nanotechnology platform. The proposal was taken to his chief's superior, the director of the Innovation Unit, who also forwarded the opportunity. "Then, we had a meeting with five directors, and they liked it very much, and I was invited to present this proposal to the president of the company. Thus, I was an analyst who managed to make a proposal for a large platform project, this project was taken to the company's presidency, going through all instances". After that, Innovation Manager A4 went through an internal process, an assessment-type evaluation in which he was promoted to coordinator of the nanotechnology laboratory. Hence, individual long-term experimentation initiatives could be valued, leading to career development in Case A1.

Competence team and individual development could be promoted directly by strategic innovation managers using a department budget directed to this purpose. They reported being able to decide on courses, training, and granting development practices as needed. Innovation Manager A1 stated that "each manager has a project budget and an administrative budget. But the fact that I manage this budget does not mean that I can approve it myself, it depends on the amount. Usually, the costs of travels and conferences, I understand that they fit together with the number of things that need to be covered that year, but HRM approves if we justify it".

7.1.2 Case A2

Case A2 had passed through structural changes, with the maintenance of the Strategic Innovation Unit. In addition, the evaluation system was reshaped, as anticipated in Case A1. The data of Case A2 was collected between 2020 and 2021. At the beginning of the data gathering, the structure had not yet changed to that presented in Figure 30; only the patent area had changed from the innovation area to the legal area.

Case A2 has publicized two strategic innovation projects in development: an experimental oral therapy for a dermatological pathology using a Brazilian plant extract, for which there was still no treatment in the world, that obtained the American Food and Drug Administration (FDA) approval for a Phase II clinical trials, and a partnership with an Asian enterprise for the development of a compound intended for the treatment of the nervous system disorders.

Case A2 invested over R$ 150 million in 2021 and was expected to invest more than R$ 200 million in innovation in 2022. Case A2's innovation portfolio held almost 200 projects in its pipeline, among similar and innovation products, being 13 strategic innovation projects. In 2018, the company created an exclusive platform for identifying and developing medicines based on Brazilian biodiversity. Eight of the strategic innovation projects in development were from this new platform; its first product launch was foreseen for 2026.

In 2019, the molecular design and synthesis laboratory, led by Innovation Manager A1, underwent thorough expansion, with the creation of a dedicated analytical area, which made the synthesis process more agile. Moreover, in 2020, the laboratory incorporated the execution of the biodiversity platform's projects in its scope, analyzing extracts and fractions, and isolating natural products, for example. In 2020, Case A2 also launched an in-silico prediction, information, and research lab, to accelerate the strategic and incremental innovation process through data science, analytics, and machine learning tools.

Case A1's strategic plan was revised for the 2020 - 2025 period. Case A2's strategic plan drivers were leadership in drug prescription, innovation agility, customers' preference, performance excellence, growth in new avenues, and preparing the company for the future. The innovation strategic plan venues were also reviewed, and the application of artificial intelligence was expanded to meet the innovation agility strategy with faster decision-making and prioritizing opportunities. The Strategic Innovation Unit comprised 13% of the Innovation Unit's project portfolio.

There were two formal committees on innovation and digital transformation on the executive body's board of directors and innovation. The executive innovation committee included all the TMT members.

There was a recognition of the strategic innovation area's capacity due to the passage of the project phase. However, Innovation Manager A1 believed this legitimacy would be more significant when launching a product.

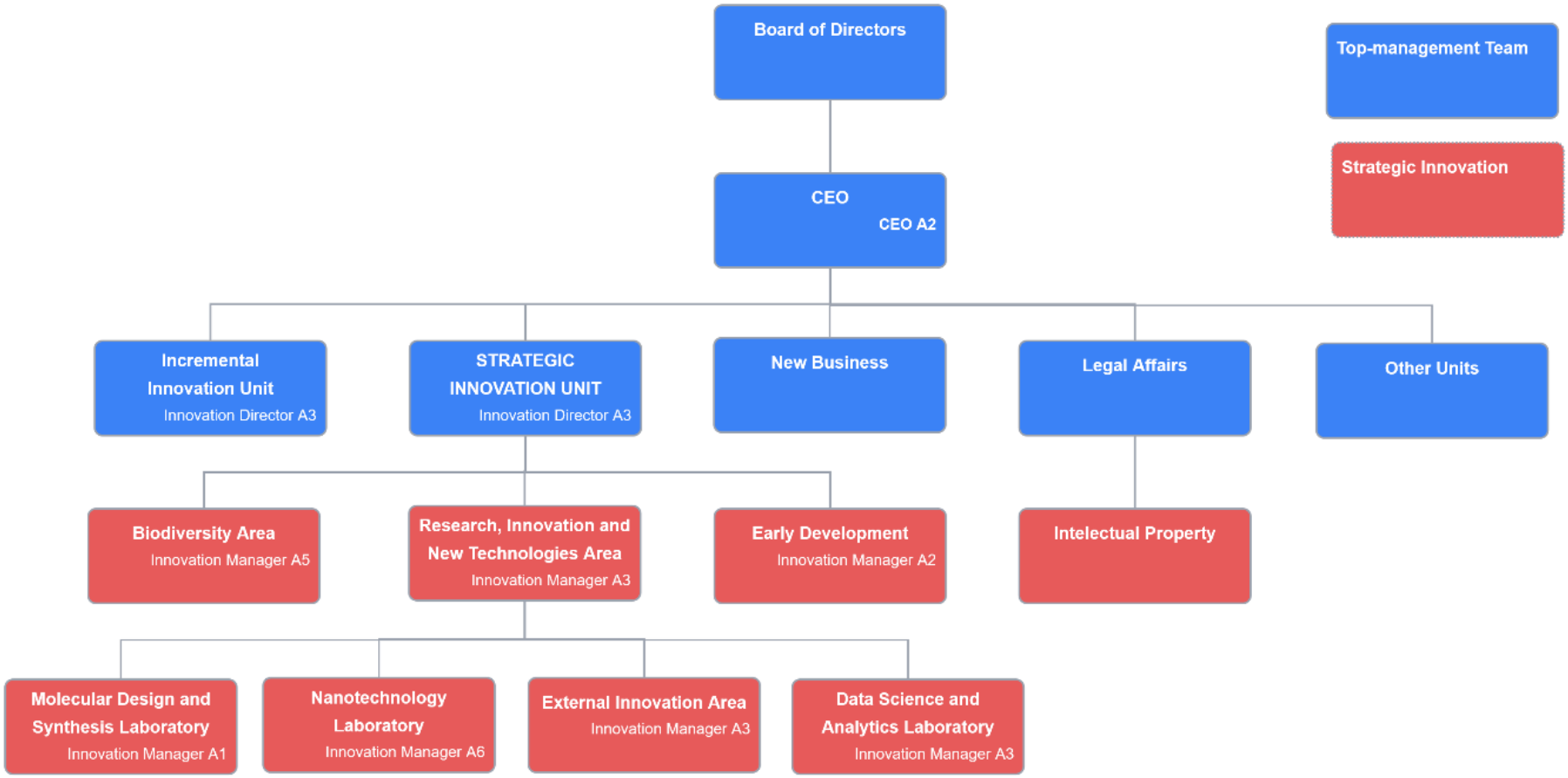
7.1.2.1 Structure

Case A2 had a formal Strategic Innovation Unit named Research, Innovation, and New Technologies, which was separated from the incremental innovation units, new business development, and analytical and formulation developments. The Innovation Unit employed around 330 dedicated professionals, being 17 placed in the Strategic Innovation Unit.

The Strategic Innovation Unit, led by Innovation Director A3, had three different managerial units: the biodiversity platform management, led by Innovation Manager A5; the early development management, led by Innovation Manager A2; and the research, innovation, and new technologies management, led by Innovation Manager A3. the research, innovation and new technologies management encompassed the molecular design and synthesis laboratory, led by Innovation Manager A1, the nanotechnology laboratory, led by Innovation Manager A6, the data science and analytics laboratory, and an external innovation area, both led by Innovation Manager A3.

The Strategic Innovation Unit, represented by the Innovation Director A3, was at the highest hierarchical level, directly linked to the presidency, as seen in Figure 30. This indicates the TMT's formal and direct involvement with strategic innovation endeavors, but not the presence of a CIO position, as Innovation Director A3 also held the position of analytical and formulation development unit's director, as head of both strategic and incremental innovation management units.

Figure 30: Case A2's organizational structure.



Source: designed by the author.

7.1.2.2 Senior leadership

The CEO of Case A2 remained the CEO A2. Innovation Director A2 was promoted to senior director position of the Strategic Innovation Unit four months after Innovation Director A1 left the company, already within the new organizational structure shown in Figure 30, in which the Strategic Innovation Unit reached the TMT level, separate from the incremental innovation units. Which would signal the presence of a CIO in Case A2.

However, Innovation Director A2 left the company just five months after his promotion to the TMT position. In 2021, Innovation Director A2, Innovation Director A1 and one of the incremental innovation directors founded a startup focused on development of therapies based on natural plant-based products, the same strategic focus of the new biodiversity platform launched in 2018 by Case A1. The startup presented in its pipeline, disclosed on the company's website, projects of five pathological targets that were also addressed by the portfolio of strategic projects from Case A2. Thus, it can be concluded that Case A2 lost three talents related to innovation, in the position of innovation directors of the company, who planned to found a startup competing with Case A2.

The executive director of the Strategic Innovation Unit position was assumed in 2021 by Innovation Director A3. Graduated in Pharmacy, he joined the company in 2005, after working for 4 years in other pharmaceutical companies, as pharmaceutical development supervisor and was promoted to manager of pharmaceutical technology. He changed companies several times, always working in pharmaceutical companies, having returned to pharmaceutical company on three different occasions. Lastly, the Innovation Director A3 was externally hired, assuming two distinct positions, one responsible for the Strategic Innovation Unit and other for the development of drugs units, both TMT’s positions. Innovation Director A3 only divulged his position of senior executive of drug development and packaging in his public CV on LinkedIn, omitting the position of senior executive of strategic innovation.

Therefore, the executive position linked to innovation in Case A2, represented by Innovation Director A3, did not present varied functional knowledge and competences, having worked only with drug formulation and development and incremental innovation throughout his career and, probably did not have expertise in

strategic innovation. Considering CEO A2's potential lack of expertise in strategic innovation and the changes that occurred during her tenure, as the focus of the evaluation of the employees of the Strategic Innovation Unit became related to short-term results, on which the area has no action, and the innovation strategy has incorporated the agility factor, which may be incompatible with the development of strategic innovation projects, it can be concluded that Case A2 did not have a TMT member that tended to prioritize and defend strategic innovation projects.

7.1.2.3 Roles and positions

In addition to Innovation Director A3, strategic innovation managerial positions involved two senior managers, two managers, and one coordinator.

The identified strategic innovation managers identified were:

- Innovation Director A3: executive innovation leader;
- Innovation Manager A3: strategic innovation manager, as he was a senior technical manager who directly managed the innovation managers responsible for laboratories;
- Innovation Managers A1, A5, and A6: opportunity domain leaders, which operated at the discovery phase, dealing with opportunity platforms;
- Innovation Manager A2: new business creation specialist. He took opportunities from the discovery portfolio to the incubation phase.

7.1.2.4 HRM practices

In Case A2, there was a significant change in the evaluation system and an evolution regarding the development demands. However, the rewards in Case A2 remained the same as in Case A1.

Evaluation

The objective appraisal was applied only for managerial positions, using just global goals for the innovation areas. The targets were linked to incremental innovation

and strategic innovation project milestones, and, in general, there were targets in which the strategic innovation unit had no action at all.

According to Innovation Manager A1, despite the discontinuation of individual goals in the formal evaluation system, the strategic innovation leaders began to informally replicate the former individual objective assessment system for the entire team of the Strategic Innovation Unit. “Formally, they are over. But as a group, they continue. Informally, we end up keeping it. Now, there were not, in any of the macro goals, specific activities from my laboratory. Hence, I cannot formally quantify that, but informally, with my team, I maintained the same standard as before. What we always try to do is to cascade the demands from alignment meetings to the managers and to the teams”.

The competence assessment remained in the same 180 degrees guidelines, becoming the only individual part of the evaluation process, but its application was expanded to analysts. Innovation Manager A1 considered the change positive for team calibration and people development, as the team then could acknowledge how to reach and exceed the goals. Still, she remembered that all strategic innovation leaders in Case A1 had already informally performed the evaluation process for the strategic innovation team.

Development

The possibility of developing a specialist career path for the Strategic Innovation Unit was created. “We had our first case, and that person even contributed to the policy creation. But later that person left the company. Thus, we had this example and then we got the approval of another person, in a specialist career model within the unit. It was interesting because in this policy we defined the model for these requests, and defended the project with several executives that were involved in the evaluation”, reported Innovation Manager A1.

She also highlighted the departure of people from the innovation area, “there are mega-capable, mega-prepared people, but they arrived at to some point of hierarchical level and stayed there. And then the vast majority ended up going fully prepared for the job market, looking for other opportunities. Including in companies that already had the specialist career model well established”.

7.1.3 Discussion

The cases of the pharmaceutical company, deployed as Cases A1 and A2, enabled a longitudinal and comparative analysis of the data. They have exhibited the following characteristics related to strategic innovation and HRM.

The strategic innovation area is legitimized within the company by the strategic alignment of the strategic innovation projects, the existence of a formalized structure and positions for its development, and the direct and formal involvement of the company's TMT with the developed strategic innovation projects.

The Strategic Innovation Unit is responsible for the discovery phase and transition of projects to be developed, with a specific focus on strategic innovation projects. However, despite this focus, the labs are frequently requested by various departments within the company. The development of these projects is executed by the PMO within the Incremental Innovation Unit.

Cases A1 and A2 outline its strategic targets to guide the selection and development of strategic innovation projects. However, the company's five-year strategic planning horizon is much shorter than the 10 to 15 years required for the execution of these projects. Although strategic innovation projects are expected to spend 2 to 4 years in the discovery phase in the Strategic Innovation Unit, according to Innovation Analyst A1, none of the projects developed by the Strategic Innovation Unit have completely left the unit's responsibility and moved to the PMO yet. Thus, there is a possibility that when strategic innovation projects reach the PMO, they may no longer be aligned with the company's strategic intent, which is a focal point of strategic innovation development (O'Connor et al., 2018), increasing projects' uncertainties.

Innovation was a crucial factor in the strategic planning of Case A1, but in 2020, in Case A2, the emphasis shifted to innovation agility. By definition, strategic innovation is not agile; it encompasses very long-term projects (O'Connor et al., 2018), especially when it comes to new to the market and the world pharmaceutical product platforms, such as the recently announced by the company. The shift from Case A1 to Case A2 brought about changes in the focus of existing labs, the roles of strategic innovation managers overseeing these labs, and investment platforms associated with the

strategic innovation projects, which may be related to this strategic plan change. For instance, the Synthesis Laboratory was expanded. However, its activities have changed the focus to support mainly the biodiversity platform. The partnership with the European company was dissolved. Moreover, the Nanotechnology Laboratory also began to focus on meeting the general demands of the company without the original primary focus on nanotechnology projects. This cyclic 5-year strategic plan review and recent organization restructures may increase internal uncertainties related to the company, impacting the career risk perception of strategic innovation employees (Fowinkel, 2014; Xiong et al., 2020).

7.1.3.1 Structure

In Case A1, the organizational structure dedicated to strategic innovation is linked to the Innovation Unit, which encompasses the Strategic Innovation Unit and four other units related to incremental innovation. One of these units, the Incremental Innovation Unit, encompassed the nanotechnology laboratory, which developed strategic innovation, and the New Business and Internationalization Unit, managed by the executive responsible for the entire Innovation Unit. The Strategic Innovation Unit incorporated five sectors, including three laboratories, an early development area, and a patent management area, distributed horizontally in the hierarchy and reported to the director of strategic innovation, Innovation Director A2.

In Case A2, there was a structural change in the organization, elevating the Strategic Innovation Unit to the TMT level, directly linked to the company's presidency. This change could increase the area's legitimacy and promote the protection of the strategic innovation portfolio through the role of a senior executive position as CIO. Additionally, the hierarchical position of the management positions below the Strategic Innovation Unit and the scope of their work has also changed. One of the laboratories remained at the managerial level, directly under the directorate of strategic innovation and the early development management area. Furthermore, a research and innovation management position was created. It incorporated the other two laboratories that were part of the Strategic Innovation Unit, the nanotechnology laboratory relocated from the Incremental Innovation Unit, and a new laboratory focused on digital technologies. The

legal area responsible for the intellectual property of strategic innovation projects was reallocated to the legal directorate.

The presence of an organizational structure for innovation in Case A1 legitimizes the company's strategic innovation capabilities (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017). Positioning individuals with strategic innovation experience in prominent TMT positions enhances the firm's commitment to innovation (Garms & Engelen, 2019; O'Connor et al., 2018; Wang et al., 2019). However, for a secure environment for strategic innovation to be established, both the innovation structure and leadership must be aware of the potential risks posed by the convergence of conflicting innovation activities under one area and the same individual's responsibility to be able to handle incremental and strategic innovation ambivalences (Kanchanabha & Badir, 2021).

In Case A2, there was still an established and legitimized structure for strategic innovation, separate from incremental innovation, and reaching the TMT level position, which could be considered a further legitimization of the Strategic Innovation Unit. Nevertheless, its executive director was not experienced in strategic innovation and also held a position as director of one of the incremental innovation units.

7.1.3.2 Senior leadership

At the start of data collection for Case A1, there was a change in the company's presidency from CEO A1 to CEO A2. CEO A1 was from the operations area with some experience in engineering. Innovation Director A2 referenced him as one of the most significant responsible for consolidating the company's strategic innovation development. CEO A2 has worked in the commercial, marketing, and financial areas without any experience with projects and lacking strategic innovation expertise. Except for CEO A1, the TMT's executives responsible for the innovation area in Cases A1 and A2 were inexperienced in strategic innovation, which is contrary to what is emphasized by the literature (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017).

The cyclic changes in the strategy focus, organizational structure, and evaluation system may also have hindered the strategic innovation legitimization

during the time the organization was accompanied and impacted the perception of career risk related to the company's internal uncertainties as indicated by literature (Fowinkel, 2014; Xiong et al., 2020).

The active participation of managers, directors, and executives through existing innovation committees and the careful consideration when discontinuing projects helped to prevent issues related to linking project failure to an individual, which may have been diminished by the strong relation of strategic innovation projects to the company's strategy (Choi et al., 2018). This practice results in the reduction of the project's uncertainties' impact on strategic innovation employees and, consequently, on their perceived career risk (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004).

The TMT's formal involvement with strategic innovation and the close relation of its portfolio with the organization's strategy may be facilitated by the existence of a strategic innovation structure and positions close to the company's TMT, which includes the involvement of a TMT member directly responsible for the strategic innovation unit in Case A2, as suggested by literature (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016).

The Director of Strategic Innovation in Case A1, Innovation Director A2, had a strong reputation within the company, as highlighted by HR Manager A1, which is in line with the literature recommendations (Bruneel et al., 2012; Cavagnoli, 2011; Fowinkel, 2014; Hebda et al., 2012; O'Connor et al., 2008). He was promoted to Strategic Innovation Director position at the TMT, but within a few months, he decided to leave the company to start his own startup. During his tenure, he could be considered a CIO due to his ability to aggregate an acknowledgeable decision-maker influential position, nurture a synergy of the strategic innovation function with the organization's strategy, and surpass resistances (O'Connor et al., 2018). While the Innovation Director A1, from Case A1, and Innovation Director A3, in Case A2, did not meet these criteria to be considered to perform a CIO position.

7.1.3.3 Roles and positions

There are formal positions and roles within the Strategic Innovation Unit structure, arranged in different hierarchical levels of the company in both cases, in

accordance with the literature's recommendation (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011). The strategic innovation team is small but not cross-functional, as suggested as usual by scholars (Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004). This may be explained by the highly specialized skills demanded by the pharmaceutical sector, and the focus of the Strategic Innovation Unit is the discovery of potential molecules for new pharmaceutical actives, that is, more related to research.

Although the existing roles seem to have similar complexity, the related positions vary from coordinator to manager for the same hierarchical position. The career development of these non-executive management positions seems to be more related to the individual's trajectory within the company than to a formal hierarchical position. Different from what occurs from the director level upwards, where the positions are linked to their roles, which indicates a greater formalization of positions and roles of executive positions and a lack of formal and legitimated strategic innovation positions in both cases (O'Connor et al., 2018).

Some individuals assume more than one hierarchical position of different levels, such as the Innovation Director A1 in Case A1 and the Innovation Manager A3 in Case A2, or from the same hierarchical position but in different areas, such as Innovation Director A3 also in Case A2, indicating the incorporation of responsibility for multiple distinguishing, and sometimes, confronting roles. This discussion about the impact of the formal incorporation of different roles and positions among strategic innovation employees was not found in the literature that relates to strategic innovation and HRM.

The Strategic Innovation Unit in Case A1 was managed by Innovation Director A2, who reported directly to the Innovation Unit. However, while Innovation Director A2 had to fight for resources with four other business units related to incremental innovation, his superior, Innovation Director A1, was tasked with developing the company's strategic and incremental innovation capacity. He responded to the CEO and innovation committees for the short-term results of four distinct innovation units while also defending the long-term results of the Strategic Innovation Unit. In addition to having to balance incremental and strategic demands, the Innovation Director A1 was also responsible for the Alliances and Internationalization area, a position he held before becoming the innovation director, further misbalancing the political field of the

Innovation Unit and jeopardizing his protecting strategic innovation projects' role (Garms & Engelen, 2019; O'Connor et al., 2018).

In Cases A1 and A2, the non-executive managerial strategic innovation positions possess a robust combination of technical and managerial competencies. However, the CEO and the Innovation Directors A1 and A3 lacked specialized knowledge in the strategic innovation field, which would be highly recommended for companies that want to develop strategic innovation systematically (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017).

7.1.3.4 HRM Practices

Talent management

In both Case A1 and Case A2, the HRM adopted an exclusive approach in their dealings with the organization's employees, which is consistent with what was detected by the literature (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022). Within the scope of positions analyzed in this research, it was identified that the workforce is segmented in accordance to their positions: executive (TMT and directors), managerial (coordinators and managers), and analyst. This defines who is evaluated and whether rewards are possible if there are any in addition to profit sharing, and the percentage of profit sharing that can be received. For example, in Case A1, coordinators and managers were evaluated objectively for their performance and subjectively for their competencies, while executive positions were evaluated only on the achievement of goals. In Case A2, analysts were also evaluated based on their skills. Nonetheless, the literature on HRM for strategic innovation is emphatic in indicating the use of an inclusive approach in innovative firms (Fowinkel, 2014; Hebda et al., 2012; Marvel et al., 2007; Marx et al., 2016) with the use of differentiated HRM systems for strategic innovation employees (Aagaard, 2017; Aagaard & Andersen, 2014; Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004).

The HRM practices used in both cases, A1 and A2, within the organization do not differentiate between employees working in innovation and other employees. Strategic innovation employees are not recognized as talents and do not receive differentiated support to deal with strategic innovation high uncertainties. Thereby,

individuals involved in strategic innovation management in Cases A1 and A2 were not motivated by specialized talent management and development practices, as recommended by the literature (Aagaard, 2017; Kelley et al., 2011; Marvel et al., 2007). Few individuals who were identified as talents were selected to be developed for an executive career path. This lack of specialized attention for strategic innovation employees can hinder the company's ability to retain and develop its innovative workforce. Conversely, the strategic innovation managers affirmed to have insistently advocated for tailored support from the HRM for strategic innovation employees, as highlighted by Marvel et al. (2007), being the creation of a Y career, that is, a strategic innovation specialist career path, an example.

Despite the company's effort to identify and develop Innovation Director A2 in Case A1, promoting him to the executive director of strategic innovation position, and achieving to have an individual capable of acting as a CIO in the organization, during the data collection of Case A2, it was identified that the company was unable to retain this and other innovation talents who sought to the opportunity to endeavor for entrepreneurship or opportunities in competing pharmaceutical companies, which left several director positions in the Innovation Unit vacant in a short period. This might be explained by the lack of structured succession mapping reported by HR Manager A1. According to her, the HR director planned to set up a career and succession process in the company by 2019, but it "was still not structured. We even put it in the planning for next year to see if we can give it a boost". She also explained that there was no clarity on who would be the successor for each position in case of the departure of any of the strategic innovation employees.

Case A2 analysis enabled the identification of various strategic and incremental innovation executive talent retention issues within the Innovation Unit directors; this difficulty of retaining strategic innovation employees is stressed by O'Connor et al. (2018). The Innovation Director A1, the TMT member responsible for the Innovation Unit, left the company in 2020 to assume a TMT position at another company. In 2021, three innovation directors founded a startup together. Innovation Director A4 as the role of CEO, Innovation Director A2, who was responsible for the Strategic Innovation Unit as CSO (the exact definition of the acronym could not be identified, the S may stand for security or sales), and the Innovation Director A1 assumed the position of a board member. The Innovation Director A4 left the company in 2020, the Innovation

Director A2 in 2021, and the Innovation Director A5 in 2019. The latter was already working as a consultant for another company and became part of another pharmaceutical company's board the following year.

On the other hand, Innovation Director A3, who left the company in 2018, returned to the company in 2021 to undertake the TMT's strategic innovation position. Therefore, between 2018 and 2021, all the Innovation Unit directors left the company to work for other pharmaceutical companies or start their own businesses. In other words, from Case A1 to Case A2, out of the total number of managers responsible for strategic innovation, including its executives, about 38% have departed from the company. Of these departures, 25% have assumed higher positions in other companies, while 13% have ventured into entrepreneurship. In the case of the six Innovation Unit's executives, there has been a complete turnover, with 100% of them leaving the company. One of these executives re-joined the company as the TMT member responsible for the Strategic Innovation Unit, despite his lack of any prior experience in long-term, highly uncertain innovation projects.

The departure of executive innovation talents, seen as key positions to be developed and retained for their organizational knowledge, can lead to the loss of innovation capabilities and hinder the company's ability to innovate and maintain its competitiveness (Kong et al., 2013). However, these arguments also apply to the strategic innovation managerial positions, which were also impacted, even to a lesser extent. The Innovation Manager A4, who initially showed an accelerated career development trajectory based on the proposal and development of a strategic innovation opportunity, left the company in 2021 after serving as a nanotechnology coordinator for three years in partnership with a European company for the development of human reproduction-related drugs, to assume an executive position as the head of a development center in a competing pharmaceutical company. It suggests that the organization is not offering instigating innovation-based assignments and stimulating intrapreneurial opportunities, thereby not presenting convincing innovation career paths, as advised by O'Connor et al. (2018).

Although innovation managers appear to have a role in job design and decision-making in Case A1, which is in accordance with the strategic innovation talent management literature (Katou & Budhwar, 2010; Oltra et al., 2022), the changes observed in Case A2, such as in the company's strategy, hierarchical structure, the

scope of work in the laboratories, focus of project platforms, as well as the turnover of executive personnel linked to strategic innovation, indicate that the decision-making power of these managers operates at the tactical level of the organization. Their job design heavily relies on supporting and implementing the company's strategy.

Evaluation

The individual evaluation outcome is utilized for three purposes: distributing profit sharing, an awarding bonus to top-performing employees, and career development, as literature's recommendations (Katou & Budhwar, 2010; O'Connor et al., 2018).

In Case A1, the evaluation process included an objective performance appraisal and a subjective competence assessment, but it was limited to coordinators and managers. The objective evaluation, based on targets, was also applicable to executive positions, including directors. Thus, strategic innovation managerial positions were assessed subjectively, as indicated by the literature (Foss & Klein, 2014; Linder et al., 2015; Marx et al., 2016), being the focus competencies related to leadership aspects and not innovation, as would be indicated by the literature (Kelley et al., 2011; Oltra et al., 2022). Regardless of an objective assessment not be indicated for strategic innovation employees working in the early stages of its development (Foss & Klein, 2014; Fowinkel, 2014; Linder et al., 2015; Marx et al., 2016), as is the case for those who worked in the Strategic Innovation Unit, managerial and executive strategic innovation positions had their performance appraised based on objective metrics. The evaluation metrics of managerial positions emphasized assignments under the individual's influence, which is in agreement with what is indicated in the literature (Linder et al., 2015; O'Connor et al., 2018), foreseeing the possibility of adjustments in the goals, as discussed in the literature (Marx et al., 2016), previously aligned with their superiors, in case of projects' uncertainties precluded its achievement, reducing the impact of these uncertainties on strategic innovation employees' evaluation outcomes.

In the absence of the application of the evaluation system for the strategic innovation teams, in Case A1, strategic innovation managers and coordinators proactively and informally reproduced the HRM's evaluation systems with their subordinates, cascading their goals to them individually. This indicates that strategic

innovation leaders, in addition to seeking support from the HRM area to overcome their specific challenges (Marvel et al., 2007) and establishing their own evaluation criteria (Aagaard, 2017; Fowinkel, 2014), take the initiative to address and overcome the perceived gaps in the HRM system that hinder their work.

In Case A2, the competence-based evaluation was expanded to include analysts in addition to coordinators and managers. Accordingly, strategic innovation employees began to be evaluated subjectively, as discussed in the literature (Foss & Klein, 2014; Linder et al., 2015; Marx et al., 2016). Whereas the performance appraisal, previously based on strategic innovation individual activities, shifted the focus to collective goals, valid for the entire Innovation Unit and unrelated to the Strategic Innovation Unit work. In other words, the objective assessment distanced itself from several points the literature pointed out as positive for strategic innovation. It ceased to be based on what was under the strategic innovation employee's control (Linder et al., 2015; O'Connor et al., 2018), with adjustable indicators linked to innovation activities and aligned metrics between areas participating in the project (Marx et al., 2016). On this account, although the goals were collective, they were not aligned or shared between the areas charged with achieving the goals; that is, the Strategic Innovation Unit employees did not influence their achievement. Notwithstanding, although individual targets were discontinued, strategic innovation leaders continued to conduct the old performance appraisal system informally.

The possibility of adjusting individual assessment targets, as occurred in Case A1, may indicate that individual uncertainties, such as the perception of career risk based on project failure and risk aversion, may be solved by evaluation practices, as asserted by Kelley et al. (2011). Also, in Cases A1 and A2, the feedback is carried out with all evaluated employees after the evaluation process, either formally or informally, which results in an individual development plan. Robust feedback promotes guidance (Kelley et al., 2011), clear communication between parts, and alignment of team members (Marx et al., 2016), indicating feedback as a key factor in diluting projects and individuals' uncertainties. Also, the individual development plan contributes to the development of strategic innovation competencies, leveraging the organization's innovation capacity (Kelley et al., 2011; O'Connor & McDermott, 2004).

Rewards

In Cases A1 and A2, the reward system remained the same. The HRM mainly applied intrinsic rewards for strategic innovation non-executive employees, while executives are expected to receive extrinsic rewards, as indicated by Shaikh & O'Connor (2020).

As extrinsic rewards are offered: profit sharing for all employees, varying only the percentage received according to the complexity of the job; a 50% of salary bonus related to performance for employees who achieve the maximum score on the annual evaluation; and an executive bonus for executive leadership positions, paid every three years. In the case of managerial positions in the Strategic Innovation Unit, the award of this performance-based bonus was alternated among them to prevent all unit managers and coordinators from receiving it every year.

Intrinsic rewards are granted by managers who can promote them internally with the budget of the area, as indicated by Hebda et al. (2012) and Kelley et al. (2011). These rewards are related to attending events and conferences, courses, and training. In addition, there are incentives for proactively developing opportunities or through company-sponsored idea programs, which encourage intellectual experimentation (Zhang & Jin, 2014).

Development

In Case A1, there was difficulty in seeing possibilities for career development within strategic innovation. This opportunity already existed for other areas of the company by then. After many requests from the strategic innovation managers, in Case A2, the HR unit enabled the possibility of an innovation strategy specialist career. However, the possibility of developing an innovation executive career was not identified. Managers who aspirate for this type of career, such as Innovation Managers A2 and A3, sought to develop managerial knowledge and skills on their own via courses and MBAs.

In Cases A1 and A2, the visibility of innovation managers among the TMT's executives was promoted on a daily basis. However, there was no identification of the promotion of strategic innovation managers to executive positions between the two cases, despite all six executive positions of the Innovation Unit becoming vacant during

that time. Thus, it was not observed in Cases A1 and A2 that the visibility given by the frequent interaction between strategic innovation employees and the TMT resulted in career development opportunities, as reported in the literature (Fowinkel, 2014; Kelley et al., 2011; O'Connor et al., 2018).

7.2 TRANSPORTATION COMPANY

The innovation strategy was based on cutting-edge technology of high complexity and multiple uncertainties, long maturation times, using a qualified workforce, low-scale production, and capital intensive, annually investing almost 10% of its revenue in research, development, and innovation. "In 2021, of the company's entire revenue, around 50% came from products launched in the last 5 years. This shows the importance of innovation for the organization", emphasized Innovation Manager B1.

The company defined strategic and priority themes to focus its innovation investments based on the intersection of the strategic map of its main business units in the short, medium, and long terms with the technological trends in the sector, emerging technologies, and new businesses. The innovation drivers helped the internal communication of innovation and transversal integration. They gave clarity of purpose to accelerate new products, processes, and business development, obtaining high-efficiency resources and investments. For Innovation Manager B1, "to attract partners, when you are doing so many things, we need to be clear about our strategic focuses."

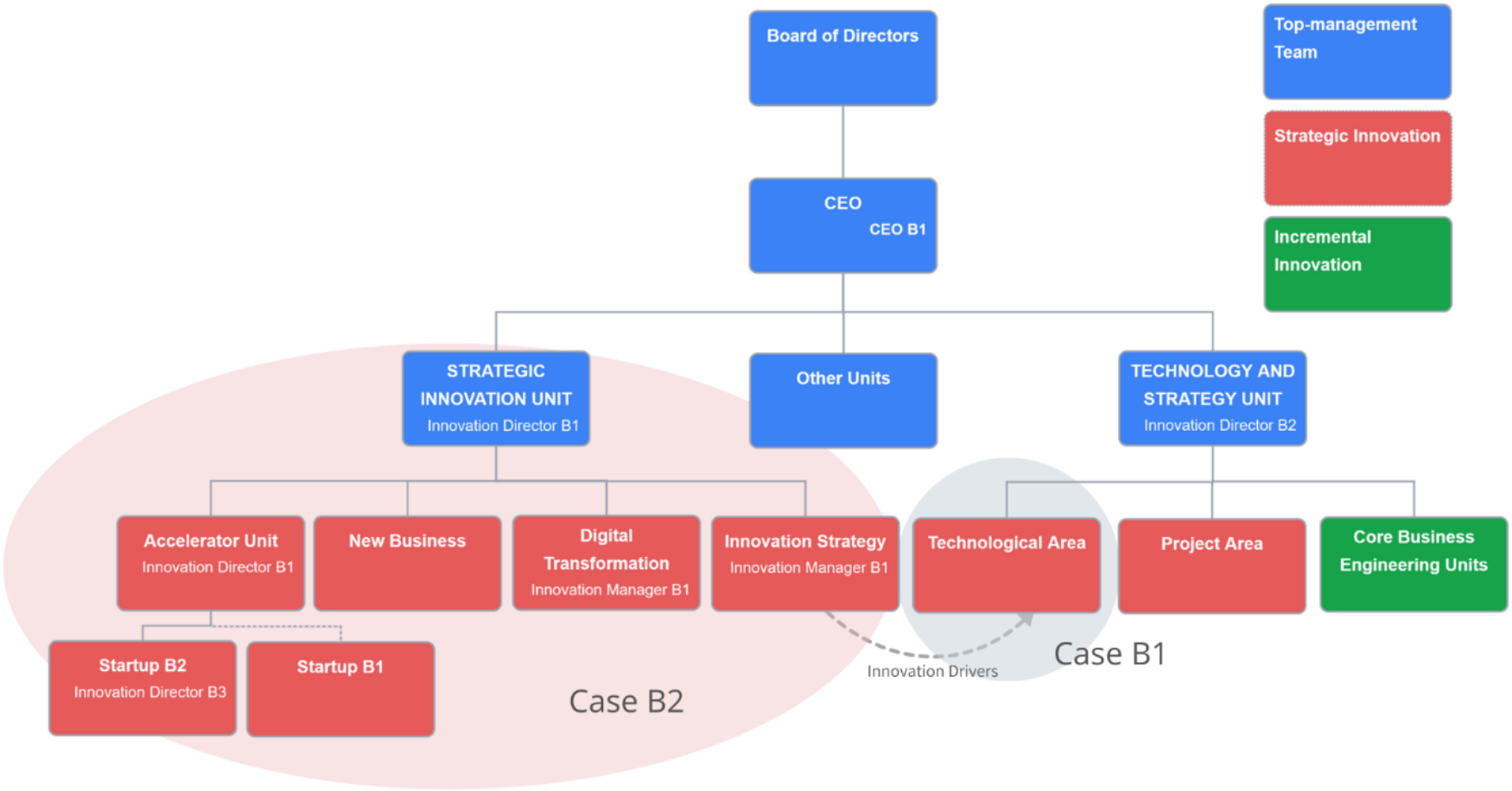
By the time of data collection, the strategic focus of the transportation company was to achieve zero emissions, modal autonomy, artificial intelligence and data science, structural efficiency of products, business platforms, data security, and user experience. According to Innovation Specialist B1, "the innovation drivers undergo all these areas. Thus, in the Strategic Innovation Unit it is defined an innovation driver leader, who will work with the entire team of monitoring, prospecting, development, and value. And this person will accelerate that development."

Structure

The transportation company's structure encompassed ten vice-presidencies linked to the CEO, shown in Figure 31. Four VPs represented the company's core business areas. The other vice-presidencies were transversal support areas throughout the organization, innovation and new business, engineering and strategy, finance, people and sustainability, legal and operations. However, according to Innovation Specialist B1, "innovation permeates all areas, all hierarchical levels. Each department has its competence and you have to orchestrate all of this and, for everyone to play the same music, you have to have a conductor. Everyone has to know the paths of innovation, where it is stimulated, where it happens naturally, so that you can bring all these issues to a positive result in our final products".

A TMT member working directly and exclusively with strategic innovation indicated the presence of a CIO position in the transportation company.

Figure 31: Transportation company's organizational structure.



Source: designed by the author.

Strategic innovation was developed and managed in two business units, the Innovation and New Business vice-presidency, called the Strategic Innovation Unit from now on, and the research & technology (R&T) area, called in this work as Technological Area. The Technological Area was located within the Engineering and Strategy vice-presidency. It was accompanied by the project development and engineering areas of each core business area of the company, with different positions of directors, middle management, specialists, and analysts. The Strategic Innovation Unit had a formal structure in the organization chart, reporting directly to the company's CEO, with positions, roles, and processes formalized and distributed across different hierarchical levels of the organization, from analysts to executives and TMT.

The Strategic Innovation Unit encompassed an area with an orchestrating role, led by Innovation Manager B1, in which it guided and monitored the projects developed by the Technological Area, an area with an incubator role for projects with greater potential and with more significant uncertainties, here called Accelerator Area, in the form of a legally separated company from the transportation company and, as the Strategic Innovation Unit, was led by the Innovation Director B1. The Accelerator Area, where the most strategic projects were allocated for greater autonomy. The Strategic Innovation Unit aimed to nurture an innovation culture at all levels of the organization, but mainly within the TMT.

Case B1 was chosen to be presented first since it is an enduring area in the company, with more bureaucratic processes and closer to those usually performed by the company. Conversely, Case B2 introduced several peculiarities both as the unit's role in guiding and aligning the innovation strategy and in incorporating companies with a structure closer to that of startups. Cases B1 and B2 will be presented in Sections 7.2.1 and 7.2.2.

Senior Leadership

CEO B1 was externally hired for this position in 2019 after serving for 15 years as CEO of several subsidiaries of a multinational industrial technology. He holds a degree in Electrical Engineering, a specialization in Business Administration, and an MBA in Finance. He worked in the engineering, technical, and commercial assistance

areas in the first eight years of his career until he first became CEO over 30 years ago. He built a good reputation at the company, “our current president makes a point of connecting everything to the company’s culture, the relationships within it, getting close to people, talking, and explaining. It makes a difference.” Innovation Specialist B2.

Innovation Director B1 was VP of Innovation and New Business for 2.5 years. Previously he served as VP of Engineering for about one year, assuming this position two months after CEO B1 undertook the company, and director of the organization for six years when he joined the company. Before that, he worked for 15 years in a subsidiary of a multinational in the oil sector, of which he was CEO in the last three years of his work. He holds a Bachelor’s and Master’s Degree in Chemical Engineering, having participated in a leadership development program.

The Innovation Director B2 was VP of Technology and Strategy; he was the former VP of Innovation; having switched positions with the Innovation Director B1, he worked for over 40 years in the organization in engineering, innovation, strategy, operations, and projects areas, with a brief passage in the banking sector at the beginning of his career. He graduated in engineering with an international executive MBA and specializations in strategy, leadership, and corporate governance.

Therefore, CEO B1 was experienced in innovation, and the VPs related to strategic innovation management, Innovation Directors B1 and B2, were both experienced in strategic innovation. All three positions presented varied functional knowledge and competencies.

The involvement of the TMT members with strategic innovation projects also occurred through various committees and forums, ensuring the TMT’s formal and direct involvement with strategic innovation endeavors. The strategy and innovation committee, in which the board of directors acted on the Strategic Innovation Unit; the intrapreneurship program committee, in which the Innovation Director B1 and directors participated; the patent committee, which was under the responsibility of the Engineering and Strategy Unit; the strategic innovation drivers committee, in which the Strategic Innovation and the Engineering and Strategy Units participated; and the steering committee, in which all the company’s VPs were involved. In addition, there was the tactical and strategic forum, led by the Innovation Manager B1 and the Technological Area’s manager, in which the director of engineering, the Technological Area’s managers and engineers, and an individual from logistics participated. The

board of directors discussed the opportunities accelerated by the Acceleration Unit, even after the startups' spin-off, and in the innovation strategy committee.

The steering committee was a strategic forum in which "we help leaders make decisions," according to Innovation Specialist B1. There was a remarkably close participation of people from the Strategic Innovation Unit and the Technological Area, and depending on what was discussed there, people from the business units were invited. The innovation forum, in which investments in innovation were discussed, investments over US$ 500,000 were decided by the VPs, and investments over US$ 20 million included the CEO.

Roles and positions

The positions that worked with strategic innovation identified among the interviewees were:

- Innovation Director B1: Chief Innovation Officer, he managed the interface with the other functions and the CEO as an influential decision-maker who used the organization's resources and knowledge to solve highly complex problems. He ensured the legitimacy of the strategic innovation function and its projects through an innovation culture and synergy of the function with the organization's strategy, managed the portfolio of new business platforms properly, nurturing and maintaining the innovation management system;
- Innovation Director B2: executive innovation leader, he managed the portfolio of technological platforms, nurturing and maintaining the innovation management system, and managing the interface with the other functions;
- Innovation Manager B1: orchestrator, responsible for the strategic innovation function's operation and the alignment of its portfolio with the company's capacity for innovation, and serving as the CIO's associate in the execution of priorities and the pursuit of objectives;
- Innovation Executive B1: executive project leader, he held an entrepreneur role, which demanded business building experience, broad thinking, combining diverse expertise and visions, dealing with ambiguity, learning continuously, creating business in scenarios that did not yet exist, and balancing empowerment and accountability. Besides, he also acted as the executive

innovation leader since he contributed to the creation of an innovative culture in order to make it more natural, accepted, and valued;

- Innovation Manager B2 and HR Manager B2: functional managers, as they were compromised representatives of their areas to accelerate, conclude, deliver, and launch strategic innovations at the most critical and expensive part of its development;
- Innovation Analyst B1: part of the strategic innovation team, supporting the orchestrator's responsibilities; and also serving as an innovation facilitator, facilitating strategic innovation events for idea generation and senior-level meetings to align the firm's strategic innovation intent and its progress;
- Innovation Specialist B2: opportunity domain leader, operated at the discovery phase, dealing with opportunity platform. He built a pipeline of elaborated projects aligned with the company's strategic intent, coaching opportunity generators, and recognizers. He was also responsible for confidential research projects;
- Innovation Specialist B1: opportunity recognizer, she was responsible for identifying technical discoveries and new business concepts that met the company's strategic intent;
- HR Manager B1 and B2: innovation facilitators, they helped to overcome barriers to strategic innovation's acceptance by scanning the innovation environment to be updated on the emerging innovation management techniques and providing strategic mentoring and motivation to strategic innovation teams.

The participation of project alumni roles was also identified through the temporary allocation of people from different areas in multiple projects; some were strategic innovation employees and project leaders, represented by strategic innovation entrepreneurs, who arrived from the ideation program of strategic innovation projects.

Even those analyst-level positions that work within the Strategic Innovation Unit were highly valued in their work. Innovation Specialist B1 reported that "the innovation committees are managed by Innovation Analyst B1. He is responsible for the strategic innovation drivers, which are the main line that brings together multiple technologies

and accelerates some development. It is something that was super valued and prioritized by the company".

There must be other roles related to strategic innovation in the organization, as there was a company-wide engagement with innovation through innovation programs. According to Innovation Specialist B2, "the entire organization develops around innovation".

HRM Practices

The HRM practices aimed at executive positions applied equally across the company. The HRM area was responsible for managing people at all hierarchical levels in the company, including the CEO. With the particularity that the position of the HR employee who dealt with issues at that hierarchical level should be the same as, or at a similar level, that of the employee who was being discussed, that is, a VP's compensation was handled by the HRM's VP. This was due to possible confidentiality involved in executive positions, such as compensation and bonuses, as explained by HR Manager B1.

Talent management

The transportation company's annual report claimed to promote talent retention through its internship and specialization programs.

The transportation company had very competent employees. When significant layoffs occurred, it was due to fluctuations in the market. There was a recent major layoff that generated an uncertain climate period. After the market uncertainties were solved, the organization tried to reemploy most of its former employees. Innovation Specialist B1 reflected that "maybe if the company thought more about the long term, maybe they could keep people for a while. Now, it lost that enormous amount of people, my area had a cut of 50% of people, for example. There was an area that lost up to 75% of its staff. And this week, a thousand vacancies were opened. It is on LinkedIn. Some areas are trying to rehire people from the team who had been laid off. Some come back, some do not, as they feel hurt by dismissal".

Evaluation

Among the executives, some goals were related to projects' results and their uncertainties. In this case, there was a general understanding that projects and opportunities might eventually become unfeasible. The top-down cascading of goals had as a consequence that the discontinuity of a project that was incorporated in an executive's goal affected the result of the executive's evaluation and his superiors' and subordinates'. Therefore, in these cases, the goals need to be realigned. HR Manager B1 exemplified that "another representative of a variable that is beyond our reach is the pandemic itself. Many companies that I was aware of had to revise their target plan due to the pandemic. It was a mandatory route change and one that no one was expecting. Then, there are cases in which some variables are beyond the possibilities of that executive to whom the goal was delegated to overcome". He emphasized that "nothing prevents the renegotiation, eventually, a new discussion of these goals."

Rewards

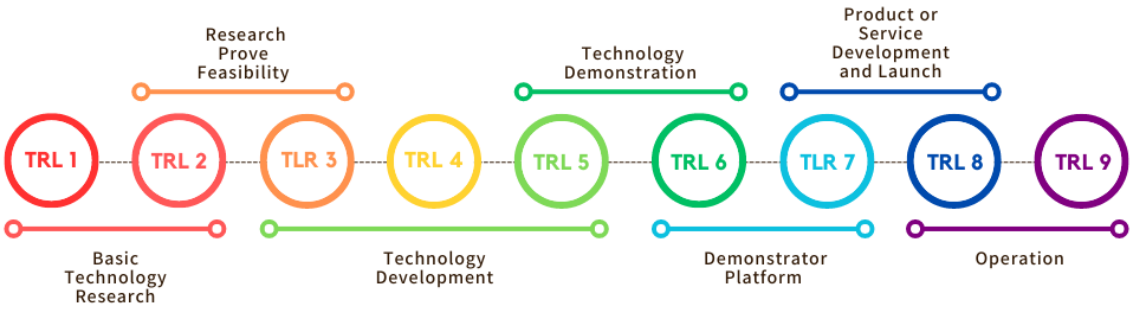
All the company's executives were eligible for bonuses, which was well-established as a market practice. The bonus was attached to the achievement of the goals plan. The goals plan was top-down and cascaded from the company's hierarchy. HR Manager B1 explained, "there is a goals plan that is combined with the direct leader. Probably the leader receives a goal from his superior. There is a natural cascade there, which obeys the fronts that each of the executives below leads. At the beginning of the following year, the target plan is refined to see which ones have been achieved compared to what was planned or agreed. This is part of the bonus composition". Thus, the goals of the TMT members were defined by them and the CEO.

The executive bonus was characterized by a short-term reward composed of three levels: a weighting of the result of the company as a whole, the aggregated result of the area or vice-presidency, and the individual contribution of the executive.

7.2.1 Case B1

The Technological Area was considered one of the “main levers for innovating within the company”, according to Innovation Manager B1, who acted as an orchestrator in Case B2. The Technological Area works with technologies of very low and low maturity of cutting-edge technology, dealing with a Technology Readiness Level (TRL) from 3 to 6, that is, a technology development level between the proof-of-concept viability and the beginning of product development or service. A TRL 1 would be the basic research of the technology, which is still just an idea, and a TRL 9, the business operation when the technology is already working within a system, as shown in Figure 32.

Figure 32: Technology Readiness Level model.



Source: designed by the author.

Projects from the Technological Area took 10 to 20 years to be launched, given the type of modal to be developed of complex systems on a low scale. The company’s strategy was the anticipation for the next, from 2030 to 2040, and future generations.

Innovation Specialist B1 asserted that “we have to deal with high complexity, frequent changes and many uncertainties. I am never going to develop a technology to put into a product that is in commercialized today. I have to plan ahead strategically and think about what is important for it to start the development, so that it can be put it in a product in 15, 20, 30 years from now”. In the Technological Area, the projects passed through two valleys of death, the first in the development of technology and the second in the application of this technology.

The Technological Area constantly and simultaneously monitored several projects in its portfolio. The company's research engineers accompanied 500 to 700 initiatives in terms of technological development before there was a possible application for the technology. Innovation Specialist B2, for example, claimed to have the opportunity to follow unnumbered projects from different groups in project follow-up meetings and design reviews.

The discontinuation of projects in the Technological Area occurred in conjunction since there was always uncertainty in research. Nevertheless, the company was developing a maturity regarding continuous learning related to canceled projects. In any case, everyone involved in the projects was reallocated to other projects. In general, people were temporarily allocated to projects, and with the completion of one project, the team was reallocated to another. People work on multiple concurrent projects, ranging from 5 to 10 different endeavors. No career risk perception related to project discontinuation was observed in Case B1.

Larger projects were not discontinued, as the development phase cost 10 to 100 times more than when in the research phase. Therefore, "a loss of 30% of the projects in the portfolio during development is natural and expected, but if there is a new loss of 30% of the technologies applied by the end of development, the costs would be very significant", declared Innovation Specialist B1.

Besides the strategic innovation portfolio, the Technological Area area also monitored the environment to discover everything that was happening in the market, among competitors, and universities from other countries, to discover where they were trying to innovate. In addition to that, the Technological Area analyzed macro-environmental factors and identified some points that should be scanned and pinched to be closely monitored. "If the strategies are aligned when capturing an information trigger, it is necessary to revise the strategy quickly," stated Innovation Specialist B1. Promising technologies emerged from this monitoring for the researchers to prospect at a very low TRL. From that point, the demand directed the technology, and the Technological Area pushed what it found relevant for the company's competitiveness, defining a portfolio of technologies to be developed.

In addition, the area defined scenarios, which analyzed both the complexity of the environment and the company and the levels of innovation. The definition of scenarios involved the TMT and the board of directors to expand this range of future

scenarios around 2040 and 2050. Then, trend analysis and prospective studies were performed. From this analysis, many strategic innovations emerged, which directed the company's strategy.

The distribution of innovation investments, such as to which department the investments should be allocated and how they should be distributed, was also discussed within the Technological Area. Innovation Specialist B1 stated, "we will do a workshop to better address this. It cannot be in just one place, because innovation has to permeate this entire organization and all hierarchies. Everyone needs to be aware of the company's purposes, and objectives to capture innovation".

In addition to capturing and developing proprietary domain technologies, some technologies were not viable for internal development. In this case, the organization incorporated this capacity by purchasing it from another company.

7.2.1.1 Structure

The VP of Engineering and Strategy, in addition to the Technological Area, was composed of a Project Area that worked closely with the Technological Area and the areas of the company's each main line of products and services, shown in Figure 31, which developed the application of projects that delivered by the Technological and Project Areas.

The Technological Area also had a close interlocution with the Strategic Innovation Unit, especially with the Innovation Strategy Area's team, which ensures the alignment of the strategic innovation drivers of the projects in the Technology Area's portfolio.

7.2.1.2 Roles and positions

The Technological Area's team employed over ten people. Among those who shared goals with Innovation Specialists B1 and B2, there were about 20 people working with technology and engineering. According to Innovation Manager B1, the entire technology development area involves around 150 people, while the VP of Engineering and Strategy employs 4,000 to 5,000 people.

7.2.1.3 HRM Practices

People management for strategic innovation was, for Innovation Specialist B2, an aspect of innovation that “I would say is the most important. People are really the core engine of innovation. Thus, everything that involves connections, relationships, this is what we do to make innovation happen”.

Evaluation

The objective assessment was guided, first by a team action plan, combined with the deliverable results the team wished to achieve and deliver. This plan was cascaded from the goals of the team manager, which could cover different areas. The team always sought to exceed the goals, which should be challenging. Overcoming the goals should occur through an achievement or action that went beyond the trivial, but with a view that uncertainties could make the achievement of the goals difficult or unfeasible. These goals were evaluated by peers and in larger forums, which verified the reasonableness of the defined goals and if they were not easily achieved.

The team had the same goals and divided responsibilities into different intensities. One person was responsible for each goal, but everyone on the team was responsible for helping achieve it. The division and sharing of the team goals are shown in Figure 33. The development of goals was monitored through a spreadsheet with several expected delivery actions for the month.

Figure 33: Team goals worksheet based on Case B1.

Members	**Goal 1**	**Goal 2**	**Goal 3**	**Goal 4**	**Goal 5**	**Goal 6**	**Mid goals**	**Annual**
Manager	-	25%	-	25%	-	50%		100%
Team E	40%	20%	-	10%	30%	-		100%
Team E	50%	-	40%	10%	-	-		100%
Team E	-	40%	-	60%	-	-		100%
Team P	20%	-	-	-	-	80%		100%
Team P	40%	15%	15%	10%	-	-	20%	100%
Team P	-	-	-	80%	-	20%		100%

Source: designed by the author.

The manager held a monthly meeting to monitor the goals with the entire team in which each team member discussed their evolution. If one of the employees was having difficulty advancing at any point in the goal for some reason, someone from the team offered to help leverage the issue. Innovation Specialist B1 explained, “if I fail to achieve this goal, I will be penalized more, but my colleagues will do too, because they will have a lower grade. Then, they help me and vice versa”.

HRBP B1 reported that the HRM area did not map complaints related to project goals but that there was a request from the areas involved with strategic innovation projects to define project milestones that go beyond the calendar year. She stated, “this is the big discussion. What do I need to deliver? What needs to have evolved within this project to be considered achieved or not?”.

In the subjective assessment, the individual and his manager indicated the evaluators, people with whom the person had the most contact during the year, internal and external to the company. These people received an email questioning the person’s strengths and points for improvement. According to Innovation Specialist B2, the subjects were related to teamwork, resulting in constructive conversations, feedback for improvement, points of attention, and positive aspects.

In the Technological Area, feedback was constant, and the record of what was discussed throughout the year was inserted into the evaluation system. According to Innovation Specialist B2, “you cannot do the assessment once a year because you are checking every month. You are talking to people, monitoring the results, and perceiving what are the behaviors that the person has adopted to reach those results”. The behavioral factor was aligned by the Technological Area’s manager every two weeks with each team member individually. Innovation Specialist B1 asserted that “he asks about what is happening, if one is being silent in meetings and the impact on deliveries, which also has a behavioral factor, and is extremely relevant, as it affects productivity.”

The subjective evaluation response was optional, and some people opted to insert just the positive aspects of the person assessed. Innovation Specialist B1 reported that “if I notice something to improve, and I have worked with the person for a long time, I call a meeting and talk about this point of improvement directly to the person. If I have to aggregate with someone, it will not be like through a HRM system”.

Then, the Technological Area's manager received and consolidated the subjective assessments. The subjective evaluation had an aggregating factor, supporting the training and development of the individual's capabilities. Decades before, this assessment was based on criticism and the negative points the person needed to work on, according to Innovation Specialist B1. "Today, it is also important to enhance strengths instead of trying just to leverage negative points."

The results of the goals and competencies were analyzed using the nine blocks tool, the same used in Cases A1 and A2, shown in Figure 29. In the past, a forced nine blocks analysis was performed, that is, when two people excelled, but it was only possible to promote one. Consequently, it was necessary to choose one of them to be developed. According to Innovation Specialist B1, "someone from HRM, who barely knew who they were, to make this choice. And this person used the subjective evaluation to do it, because the HRM could not question about the delivery, as the delivery was reported. Then, justifying with a fake point of our attention, because we know the negative points that we have, someone in HRM would change your evaluation results to drop you into another quadrant. This resulted in a lot of criticism and increased turnover. People left because that they could not stand to be seen in that negative light by the company". By then, the subjective evaluation was made by the view of the evaluators "that you chose and that your leader chose, it is much fairer," asserted Innovation Specialist B1.

At the end of the team assessment, the manager assessed whether he agreed with the results. Each team member inserted the degree of achievement into the system according to their perception. In cases of a result below expectations in the assessment of goals, the manager could reassess and realign with his peers and superiors. Innovation Specialist B2 argued that the target might not be achieved or be achieved on top of the target "and it may have been said that we achieved more than we planned," in the alignment commented above, "one can say that delivered more, as, beyond the goal, the person did this and did that."

The manager assigned a final grade, with a general report from the raters of the subjective assessment, including his perception and the objective goals. The final result of the evaluation impacted the payment of profit sharing.

Feedback was provided, which included guidance on points that could improve the person's visibility in the company so that they had the possibility of more significant

growth. Finally, an individual development plan was designed for the following year. This individual development plan aimed to develop the individual to help the person grow in the intended career.

The team was accompanied by an HRBP, who was part of the team, to understand how the area operated. This was a new HRM model that the company had recently implemented. According to Innovation Specialist B2, “it is a challenge for her. We are in this learning phase, where you are always close, available, and working for the team. And when it has an adequate HRM structure, the team can borrow from this construction. But there are good experiences, and there are experiences. It is usually not adequate as it should be because they cannot be with the team all the time or they have to attend to more than one area. But in the moments when it worked, when they managed to have the proper dedication, having the necessary time was good. It can be very positive. The HRM has to be a partner, has to be a part of the team, and has to understand. How can they contribute if they do not understand the business?”.

Rewards

The rewards aimed at those who worked in the Technological Area were primarily intrinsic and aimed at developing competencies. Profit sharing was paid, linked to target achievement. The company also paid for travel for presentations at conferences abroad, but it was specified by each manager and not granted to the whole company.

In addition, there was an idea generation program for incremental innovation, which prize was a dinner with the company’s CEO. The production of patents and the contributions to an internal system of community practices, which served to share knowledge and lessons learned, were also recognized.

Although HR Manager B1 stated that “variable compensation starts at managerial levels”, in the introduction of the topics of the interview, Innovation Specialist B2, who had been in managerial positions in the organization for over 20 years, asserted that “there are many things that are a little out of my scope in this matter of rewards. Directors have more adequate knowledge about benefits and rewards”, and even when asked about the rewards he could receive, he did not indicate any.

Development

Case B1 presented the possibility of developing a specialist or management career among the development practices. According to Innovation Specialist B1, “sometimes, the leader perceives in you some potential for growth in some area. For instance, I never wanted to be a manager and lead teams by choice. I know that the specialist career is much less valued, but that is what I like, becoming a consultant within the company. That is why I invested in studying because I already wanted to follow this career”. Innovation Specialist B2 justified that “if the company needs to deepen the understand of a subject it wants to apply, it is possible to build much of our knowledge base by facilitating an employee to do master’s or doctoral course.” However, it was observed that, between the master’s and doctoral degrees, Innovation Specialist B1 had to take a year, called a “sabbatical” by the company, in which she had to dedicate herself fully to her work within the company before enrolling in the selection process for the PhD degree.

The individual development plan was an outcome of the evaluation process. It encompassed aspects to be developed, which varied according to the individual’s aspirations and perceptions of what was necessary to be developed. Some examples were job rotation, specific training, courses, postgraduate programs, conferences, and readings. The company did not pay for the courses, but guaranteed time for their development, when necessary, part-time or one day/week, for example. Innovation Specialist B1 reported that “when I came to this area, I was already in the process of enrollment in the master’s program. This was foreseen in my individual development plan. Thus, it was stated in my individual development plan that I would have from half a day to one day of work per week released to have classes and study, because it was a goal at the company, that generated value for it. The individual development plan must be aligned to the company’s value”. The competencies developed by the individual development plan courses and training enabled the Innovation Specialist B1 to be promoted; in other words, the use of intrinsic rewards led to career development opportunities.

The development courses included in the individual development plan were afforded by the employee. The employee could ask the company to pay a percentage of the course fee. Regarding the *lato sensu* courses, Innovation Specialist B1 reported that they did not ask the organization to pay for the course, “but they said they would

pay for it. However, at some point, the company gave up and did not pay. I did not withdraw from the course and obtained a discount from the university. Afterward, I was hired to be a lecturer and coordinator of a postgraduate course at the university after I finished the course". This showed the perception of professional development obtained in another organization, even if not competing with Case B1, right after the occurrence of a point of individual uncertainty, having to pay for an expensive course, which appears as an individual goal, and that the company said it would pay along with a new parallel career opportunity that was different from what was being developed until then. For the organization, this could mean an increase in the difficulty of retaining highly specialized people for external opportunities. This is emphasized by the context in which the interviewee placed this information. When asked what incentives and rewards the Technological Area employees could receive, she replied: "None. Nothing, zero. Zero indeed. When I took the *lato sensu* courses, they were not cheap. I was enrolled at University X, which is an expensive college and, in another city".

7.2.2 Case B2

The Strategic Innovation Unit was created in 2017, specifically focusing on innovations with high technological uncertainty or low business maturity, that is, strategic innovation. The unit worked with the orchestration of projects in the Technological Area and with the incubation of projects involving technologies for new products and services aimed at markets that did not yet exist. As stated by Innovation Manager B1, "no one knows exactly what will happen to it. We do not have an established regulation, nor a competitor. We will operate in the market and create a market along with the other players".

7.2.2.1 Structure

The Strategic Innovation Unit, displayed in Figure 31, aimed to identify the main assignments for developing strategic innovation businesses, prioritizing investments and roadmaps, accelerating the innovation culture, and working with startups. To this end, one area of the Strategic Innovation Units was registered as an independent company, acting as an Accelerator Unit for strategic innovation opportunities. The other areas of the Strategic Innovation Unit, Innovation Strategy, Digital

Transformation, and New Business, were integrated into the daily routine and structure of the organization.

The separation of the Accelerator Unit from the enterprise was intended to enable differentiated processes and separated investments “to develop a type of innovation that, if it was in the traditional processes of the company’s products, would not happen,” affirmed Innovation Analyst B1, combining strategic alignment in innovation and freedom to make new process choices and resource utilization. However, in the view of HRBP B1, which worked with the Strategic Innovation Unit, “in relation to HR systems, the Accelerator Unit is a 100% the same as the organization. It follows all the guidelines and policies of the company, performance, everything”, but with specific and differentiated positions. This was reinforced by HR Manager B2, who was dedicated to Startup B2, “this public has a very high expectation of change and autonomy now, deciding where they want to go and what they want to buy. And it is not quite like that, because as the company holds 80% of Startup B1, even after the spin-off, for example, it still has a big influence on decision-making. I have reminders, that today it is a fact that the company is still in command”.

The projects that were incubated by the Accelerator Area, in the model of startups, while they were in the TLR range of 3 to 7, that is, from the initial development of the technology, elaboration of its proof of concept, until the development of the system or product and start of its launch. The expectation was that these opportunities would undergo a spin-off during or after its development, keeping the organization as an owner of a large part of the startup.

Startup B1 left the Strategic Innovation Unit through a spin-off in 2019 and focused on developing a new modal and its traffic management. According to Innovation Manager B1, “it is a complete urban mobility solution. We currently have more than 1,800 units sold. But it has huge potential to have at least 5,000 modes in use in over ten years”. Innovation Analyst B1 affirmed that Startup B1 had a higher valuation than its parent company. He remarked that “there is not even a product yet, but it is the dynamics of the new world, of an exponential nature. We looked for an investor to share the risk with us. And their investment gave the startup this valuation. The mobility market is estimated to be huge, but it is still very uncertain and far ahead. The parent company is still the largest shareholder, but the plan is to dilute its stake in the next investment rounds”.

Startup B2 was incubated in the Accelerator Area, with the expectation of a spin-off soon. It was a digital service platform operating in the transportation sector. It was an opportunity that stemmed from a need for greater efficiency in the company and the sector, which sought to connect users and service providers through integrated digital systems. It was led by Innovation Executive B1 and incorporated a team of more than 30 employees, many of them located in the United States and some in Brazil, with different hiring forms. HR Manager B2, responsible for HRM at Startup B2, accompanied the project from the perception of the opportunity and gradually became dedicated to Startup B2. Hence, she had great proximity and understanding of the business. She pinpointed that some of her most significant challenges were that the team was spread across several locations, the employees' different types of employment relationships, and their expectations when compared to the parent company.

In addition, the Strategic Innovation Unit held a Digital Transformation Area, focusing on the internal public, which aimed for operational excellence and efficiency, with a role to promote autonomy. Innovation Manager B1 added that for digital transformation, it was necessary to "have good internal relationships, build partnerships with managers, and executives within the company because they will have to invest on that movement that does not last for a week. (..) We have a group that is small but executes and launches the project and tries to transfer the system to the target area so that it can later continue this work and gain maturity. This work is much more complicated than it seems. It needs investment. There is a lack of people and talent to do this type of work". After the implementation, the system needed to be constantly updated; it was necessary to educate and engage people within the areas and measure efforts and results.

The New Business Area, which was still being established, was focused on opportunities that could not be supported by any of the company's business units because it did not have "the structure or process to support it. Thus, we work with different areas to structure this new business, until it becomes a new business unit", according to Innovation Manager B1.

7.2.2.2 Roles and positions

The orchestration role of the company's innovation drivers was performed by a leader who perceived the organization as a whole and the synergies between its areas. That is, in which areas each system was present, who dominated each technology, which investments were made across the organization, its partnerships, and operation design. The orchestration aimed to guide decisions between purchasing from a partner or developing a capability within the company, to have a broad vision of the roadmap and the portfolio, allowing the integration between them, and enabling the prioritization of opportunities based on their potential, culminating in new products and new businesses. An example of the importance of innovation drivers, given by Innovation Manager B1, was that "the organization acquired a percentage of a company of a certain modal in another country, and joined a trial partnership with them, aiming at nurturing apprenticeship related to the innovation driver focused on autonomy. The intention was to apply it to the products of one of our business lines with no passengers, followed by one line with few passengers, and so on. This is how the innovation driver works. If every business unit were looking at their products and concerned about their market, the incorporation of this competence would not be organizational. There must be someone who can work on this in the short, medium, and long term, extracting the value from these lessons learned and these investments".

Another role of the Strategic Innovation Unit was to promote an innovation program throughout the organization and act as an incubator of the program's projects. The Strategic Innovation Unit was responsible for an intrapreneurship program focused on strategic innovation, in which it launched challenges for the entire company and granted incentives for its participants. Innovation ideas and projects for any area of the company could be enrolled in the innovation program. The registered projects underwent a committee that involved the Innovation and New Business VP and directors and were voted according to pre-established classification parameters, which verified whether the project could be a competitive differential for the company, going through an innovation funnel.

According to Innovation Manager B1, the employee who registered an idea in the program did not need the leader's authorization. Upon submission, the project was discussed in the Strategic Innovation Unit. If it had a business application and was connected to the strategic intent, "we align and seek those within the company to give

this person time to develop the idea. We give 20% of the individual's time dedicated for about three months to mature this idea with us and whoever else we have mapped from other areas to work on it. It means using the company as an asset platform so that we can improve and help ideation. If the opportunity is doing well, it goes to incubation. And then, the idea owner can have up to 100% of his time dedicated to the innovative project."

In the cases in which an individual from another area of the company advanced within the intrapreneurship program to the point of becoming dedicated to the strategic innovation project, the Strategic Innovation Unit negotiated with managers to allocate the project and allowed about six months to execute a proof of concept, deepen, and test the project. Then, it moved on to implementation, when it was possible to have a clear perception of the need for allocation to a business unit or a sponsor within the company. According to Innovation Manager B1, "a sponsor who believes in the adherence of the business can prioritize the budget, bring it to a construction within the business unit, which is what we want the most". And he adds, "we play a role here as a valley of death for ideas and entrepreneurs. There are many things that stop along the way, but it is a chance for this to be well seen by the company's ecosystem."

As the project gained importance and the individual needed to be exclusively dedicated to the strategic innovation opportunity, the Strategic Innovation Unit called the manager of the entrepreneur's area of origin to align the departure of the innovative entrepreneur from the area and to allocate someone else to the position the person occupied until then. Innovation Manager B1 reported that "we have cases like this today. Of course, the person was scared to death. Because if the project goes wrong, he was afraid of losing his job. But we calmed him down, because now he is in our area and we know his talent, nobody wants to throw talent out of the company". Therefore, the innovative entrepreneur was assured of having a new position in the company even if the strategic innovation opportunity failed.

7.2.2.3 HRM Practices

In Case B2, a more significant concern was identified by a reassessment of the HRM systems for innovation. HRBP B1 reported that there was a squad focused on the "future of work" theme in the organization. This was the largest squad within the

company, involving people from many areas, being an extremely multifunctional project. Some of their concerns were about the division of demands of the deliverables in a feasible way to avoid burnout and to put their dedication to part-time projects in the goals of the evaluation process, aligning them with the leadership. There were no cases reported in which there was resistance by the manager to reallocate the goals, according to HRBP B1.

Talent management

Retaining and attracting talent related to strategic innovation roles was a special concern within Strategic Innovation Unit. Innovation Analyst B1 commented that “the company has an engineering DNA. Thus, we manage to retain a lot of people who are passionate about the modals we manufacture. But even for these careers it is sometimes difficult to retain because the world is very dynamic. Then, we have been thinking about other ways of working with this issue of innovation and HRM. I often address this discussion. I am very concerned about this mainly because of the innovation drivers. We work together with the HRM to understand how we can evolve in our careers to have this talent retention and also be attractive to hire many talents”.

The area had experienced a high turnover, more expressively in jobs related to digital transformation, such as developers and data scientists, whose job market was escalating, offering very high salaries. That was why the Strategic Innovation Unit had been working with the HRM on strategy for innovation and digital transformation roles to create interesting careers, attractive remuneration, and avoid losing competitiveness due to lack of labor quality.

A talent management initiative geared towards innovation drivers’ leaders and executives from the Accelerator Area was the innovation executive career, defined by Innovation Executive B1 as “a position of entrepreneurship within the company”. This position was created over four years earlier in response to a “very specific and emergency need to create an innovation subbrand based on the company’s branding. At that moment, some opportunities to be developed were already mapped. But it would need someone with adequate expertise to lead these projects” for the Accelerator Unit, asserted HR Manager B1. Initially, 3 to 4 people were assigned to this position and were already responsible for the mapped opportunities, part in Brazil

and part in the United States. The innovation executive was not organizationally considered a leadership role, but the need to develop a leadership competence eventually arose to support the innovation executives as some opportunities matured.

The creation of the innovation executive role was an initiative from the Innovation and New Business vice-presidency to the HRM. The area requested a position that allowed the position to act as CEO of the startup incubated at Accelerator Unit. The HRM's contribution was, according to the HR Manager B1, who participated in the design of the position, "first we needed to understand as a member from the HRM what the innovation executive does to make the job description. After a few rounds directly with the executive responsible for the Accelerator Unit and with the people we already knew would occupy this position, to understand the context of the Accelerator Unit, what the projects were, and what the challenges were at the time, together, we designed a job description. And that job description helped to determine some issues regarding compensation, talent acquisition, training, and development, for example. The job description also helped to understand, for example, if a career as an innovation executive and for other functions within the Accelerator Unit was viable and what the job levels were. I needed to do job matchings with the market, that is, if I could find similar positions in the market. Then, I could determine what salary ranges they could receive and which benefits or bonus plans could be classified, for example".

The innovation executive career was different and aimed to retain internal innovation talent or attract external talent to develop very specific functions of strategic innovation. At the time of the research, there were five innovation executives, three in the Accelerator Unit and two in the Technological Area. The Strategic Innovation Unit thoroughly discussed this career so that these individuals had an attractive career compatible with their roles. Since the strategic innovation opportunity became an independent company capable of maintaining and consolidating itself without the parent company, the spin-off of the startup was a major milestone for the opportunity and the innovation executive's career. Consequently, the spin-off of the startup meant the promotion of the innovation executive to the position of CEO of the strategic innovation opportunity.

Regarding the other innovation and digital transformation roles, HRBP B1 stated that the HRM had sought practices for innovation and digital transformation areas in the market. It was a significant challenge for the HRM "to adhere to this new world both

in terms of management and of the team itself.” The HRM had been discussing job descriptions, evaluation, and performance systems.

In addition, the HRM was encouraging squad work, that is, small and flexible teams responsible for developing and delivering a product or service, with an agile mentality to evaluate people within this context in an annual delivery. The HRBP B1 explained that “all this is under discussion. We are evaluating to see what makes sense and what the market has practiced. We are also noticing that the market is finding itself in this new context. There is even an opportunity to play a leading role, eventually, in terms of structure, ways of working, measuring this work, and managing it, how to manage a team that will eventually be multifunctional, a team that works on projects, on deadlines. It is exactly in this context that we find ourselves now”.

In the Startup B2 context, HR Manager B2 reported that the changes in the employment relationship of the employees, such as those based on individual contracts of services and outsourced workers, have changed the employees’ demands related to established practices in the parent company, which made it difficult for the HRM to understand what is attractive to this public. Those with more autonomous employment relationships demanded flexibility in working hours and asynchronous work to be able to take that day off when they wanted to be paid by the hour. According to her, “This autonomy and flexibility are being increasingly valued. They are dedicated, like what they do, make deliveries, but the moment they have any setback, they want to have the freedom to say ‘tomorrow I am off’”. She mentioned that Innovation Executive B1 was very open in this regard.

Shortly before the interviews, Startup B2 held a week-long presential event organized by the HRM, in which they managed to bring together a large part of the team in the United States. At this event, people brought demands of HRM practices used by some companies in the market, which were being highly valued by the public that worked at Startup B2, such as working four days a week, and flexible benefits “to the point of being something you exchange in points, something customized for each individual, according to their needs,” explained HR Manager B2. Those requirements were responded to, emphasizing her lack of autonomy to apply them fully, yet “the manager has the autonomy to do this in the areas, but we have to be careful not to implement things that could generate a reaction on the benefit of 40 individuals, compared to 20,000 employees”. She stated that such information was rapidly spread

throughout the organization; for example, right after Startup B2's team had talked about working four days a week at the event, the responsible for the labor area of the parent company contacted her to complain about this practice as something already implemented. HR Manager B2 asserted that the responsible for the labor area was alarmed and afraid of the repercussions that this type of initiative could have if there was no previous alignment with the organization's HRM. Despite the enterprise's concerns, HR Manager B2 believed that those practices would be a gain in attracting strategic innovation talent.

The Startup B2 event enabled the identification that, regardless of the type of the employee's contract, the entire team felt part of the company, according to HR Manager B2. Usually, problems in this regard occurred within the parent company due to a lack of access to organizational channels and tools that some people, formally hired, could enter, and outsourced workers did not have access to. This issue was overcome by Innovation Executive B1 through the adoption of external tools, such as Google Drive, Trello, and Slack, for the use of the entire team.

Furthermore, HR Manager B2 and Innovation Executive B1 identified at Startup B2's presential event that employees were very apprehensive about the possibility of discontinuation of Startup B2. This concern was promptly addressed and aligned between them, who presented the parent company's vision. They assured the employees of a trend of absorption of Startup B2 and its employees by the parent company in case it did not spin-off for any reason as a Plan B. Innovation Manager B3 also reported that Startup B1's employees felt much pressure concerning the startup's discontinuity.

Evaluation

The evaluation system in Case B2 consisted of objective and subjective evaluation, except for the startups of the Accelerator Area. The objective assessment was composed of individual and team goals, 80% of the results came from the individual assessment and 20% from team assessments, but this composition could vary yearly. The collective goals of the Strategic Innovation Unit were the achievement of the Innovation Director B1's targets. However, they were not cascaded to managers because it was a small area, and these goals were not always related to the work of

all areas of the Strategic Innovation Unit. For instance, the collective goal of the previous year was related to reaching the valuation of Startup B1.

The individual evaluation comprised 3 or 4 goals defined by the individual and the leader. Its result could range from 50% to 150% of the achievement of the goals. The individual goals were closely related to the work performed by the individual and were cascaded from the leader's goals but with greater detail. Innovation Analyst B1's targets were, for example, the number of projects that entered and passed the phase in the intrapreneurship program, the creation and approval of a new investment fund, and support in the maturation process of innovation drivers. According to Innovation Analyst B1, achieving these goals was challenging due to the strong dependence on other people's work and the changes in the organization's priorities that usually occur. Therefore, there was a margin for the realignment of goals with the leader.

The subjective assessment was the same as in Case B1. Employees and leaders indicated up to 15 people with whom the individual worked in the previous year, and they were invited to respond about the person's strengths and points of improvement at work.

The final result of the evaluation was positioned on the nine blocks diagram and impacted the payment of profit sharing, as it was across the enterprise. Then, an individual development plan was elaborated, in which the employee and the leader chose a training course, participating in a conference, reading a book, or doing a theater course to improve communication and speech. Innovation Analyst B1 said he intended to undertake corporate venture capital training, which was a role he had been assuming since the previous year, and he assured his manager would agree. The individual development plan choices were subjects that the individual intended to improve, develop or adjust.

The Innovation Executives assessment was based on the challenges of the year for the startup. The goals were related to the evolution of innovation, market recognition, and articulation of the business, which was how the market evaluated executives. The subjective assessment was a formal 360º, and the result was placed in the nine blocks diagram by the HRM, and the feedback was given by their superior in the same form as the parent company's executives.

Within Startup B2, Innovation Executive B1 maintained an open-door policy with all employees and used collaboration tools, maintaining a widespread practice of conversations, alignment, and feedback. The startup did not incorporate the importance of the enterprise's formal assessment. In this case, the individual development plan was elaborated every six months or one year and became increasingly leaner and informal due to the emphasis given to feedback. The feedback incorporated suggestions for developing competencies and short-term realignments, in which could be discussed succession maps with a medium and long-term view, aiming to simplify and streamline the work, asserted HR Manager B2.

Rewards

The rewards aimed at those who work in the Strategic Innovation Unit were primarily intrinsic and intended for the development of competencies. Extrinsic rewards were geared toward innovation executives, but no incentive policy for non-executives was identified. There was a profit-sharing payment for all employees linked to targets' achievement, which could exceed 100% of profit sharing.

Each area had an investment budget for people development, but its distribution depended on the manager's decision. The Strategic Innovation Unit received much investment, as it involved small areas and focused on strategic innovation, providing opportunities to develop innovation competencies.

By the time the innovation executive position was created, "in the universe of innovation", according to HR Manager B1, which he had presented as the universe of startups focused on innovation, it was already common to pay variable long-term remuneration based on equity if the long-term business results of the opportunity, rather than a short-term bonus. "But we were not prepared at that time. And even so, we are in a phase when we are looking at a much more short-term variable rather than long-term remuneration. However, in any case, we need to create motivation through our systems, and reward those who performed above average or above expectations. Thus, so that we could also retain people and their expertise, this year we started paying a short-term executive bonus to the innovation executives". Innovation Executive B1 confirmed that he had received extrinsic rewards in the form of an executive bonus, focused on the short-term results, and stock shares as long-term

incentives, within what was expected as market practices aimed at executives, besides profit sharing.

There was an expectation in the Accelerator Unit startups that variable remuneration would be paid to all those dedicated to the project. HR Manager B2 explained that there was a contradiction “the challenge of this public is that they really want to do things on their own. And then, when discussing variable compensation, I have to be careful about when I am going to apply any change, any implementation like this. It has to be somehow aligned with the parent company in order not to distort the public that is inside it”. She exemplified that the parent company held thousands of employed software engineers, some of them dedicated to startups, and “if I pay a super aggressive remuneration and give equity to those who are in a startup, I distort the remuneration of others here in the company. They will all want to go to the startup. Hence, there is a very fine line in that context”. At that moment, the HRM was evaluating a shareholding rate for Startup B2, with a more attractive fixed salary of about 75% and a lower variable remuneration of 25%. At Startup B1, they achieved a 50% salary division between fixed and variable remuneration. However, there were still doubts about the variable remuneration package, and Startup B2 hired an external consultancy to develop the remuneration package.

Development

Among the development practices, besides the possibility of a specialist career, the Strategic Innovation Unit, as a very lean area, held few managerial positions. In the Strategy and Innovation Area, for example, there was a manager who reported directly to the VP and led five analysts. For this reason, Innovation Analyst B1 believed that it was possible to have a position evolution in the sense of becoming a manager, even without a change of position in the organizational chart. He commented, “I believe that the Strategic Innovation Unit tends to grow and generate new leadership positions. This specialist career role in innovation management, which is what I do today, does not have much room for me to be promoted. But I see a lot of possibilities and it is this range of opportunities and possibilities that attracts me. I know that today I have visibility and the possibility of several interesting paths for me in the company”. As occurred in the engineering area of the company, the strategic innovation analysts had a career that could range from 1 to 5, then moved to a specialist career. The HRM

provided a description of each position, the steps to be followed, the responsibilities related to the position, the expected performance, and the salary range for each of these levels. While at Startup B2, career development was simplified, and the value of the individual was recognized and valued regardless of the employee's position at the startup.

7.2.3 Discussion

Differently from the cases of the pharmaceutical company, which allow a longitudinal analysis of the data, and there was no significant differentiation regarding the complexity of the projects, for a broad comprehension and analysis of the transport corporation, outlined in Cases B1 and B2, it is needed a separate and a supplementary discussion of its strategic innovation management and HRM systems.

The transportation company's strategy centered on emerging technological trends, strategic innovation projects, new business opportunities, and the environmental, social, and governance (ESG) agenda. This was pursued by firmly aligning all strategic innovation projects to the company's innovation strategy drivers. The culture within the organization stimulates all employees to contribute to the pursuit of innovation. Therefore, there were programs to foster both incremental and strategic innovation. These initiatives aimed to improve internal processes and develop new products and services.

Structure

There was a formal structure dedicated to strategic innovation, the Strategic Innovation vice-presidency, and an area within the Technology and Strategy vice-presidency, the Technological Area, that also developed strategic innovation, which legitimized strategic innovation within the organization (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017).

Strategic innovation projects were developed in two company areas: the Technological Area, within the Technology and Strategy Unit, and the Strategic Innovation Unit. The strategic innovation projects were orchestrated by the Strategic

Innovation Unit and developed in the Technology and Strategy Unit. There were also strategic innovation opportunities incubated in the Accelerator Unit, which was part of the Strategic Innovation Unit, in the form of startups.

Senior leadership

According to the recommendations of the literature (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017), the organization had a CEO, CEO B1, who was experienced in innovation and had knowledge in various functions and competences, as it is also indicated by the literature (Chung & Kang, 2019; Garms and Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014). Although he was hired externally, which can hinder the development of strategic innovation (Cummings & Knott, 2018), he has built a good reputation among strategic innovation employees.

The VP of the Strategic Innovation Unit, Innovation Director B1, acted in a role corresponding to the CIO due to his experience with strategic innovation, position of influence, ability to blend unit synergies with the organization's strategic intent, and overcome obstacles (O'Connor et al., 2018). In addition, the VP of Technology and Strategy, Innovation Director B2, also has a background in strategic innovation. However, he was in a position that incorporated functions other than strategic innovation development. It is possible that there were other members of the TMT experienced in strategic innovation as it is a historically technology-based company. Thus, the TMT had formal and direct involvement with the strategic innovation projects, as suggested by the literature (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016) through decision-making committees and the close monitoring of the projects by the two VPs involved in their development, which may decrease the impact of strategic innovation project's uncertainties from the individual level (Choi et al., 2018).

HRM Practices

Evaluation

All employees involved in strategic innovation were evaluated objectively. However, the evaluation system may differ on a case-by-case basis.

Executives are assessed only on their performance; the other employees, in addition to the objective assessment, undergo a competence assessment. However, while in Case B1, the goals are collective, in Case B2, they are individual.

The HR Manager B1 stressed on the possibility and necessity of renegotiation of goals in case of discontinuity of projects or other uncertainties that impact the result of evaluations and that it is a widely referenced practice in the units that work with strategic innovation. This was reaffirmed in all interviews conducted. The possibility of realigning objective goals appears to reduce the impact of context and project uncertainties over individual career risk perception (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004) and job security (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011), as there is a high demand for temporary allocation of employees to parallel projects.

The executives' performance evaluation is based on the achievement of cascaded goals from the top-down annual goals plan, defined together with the CEO and passed on to the team subordinate to him. This indicates that goals are defined by executives and managerial positions according to the work under their domain (Linder et al., 2015; Marx et al., 2016; O'Connor et al., 2018).

Rewards

Therefore, executives are evaluated according to objective goals, and the result of this evaluation is used to pay the executive bonus, a short-term extrinsic reward. Nevertheless, this incentive does not reward long-term success, and encourage intellectual experimentation, as it is expected for strategic innovation-related positions (Zhang & Jin, 2014).

Executives receive variable pay rewards, while other strategic innovation positions do not, as evidenced by the literature (Shaikh & O'Connor, 2020). The executive bonus comprises several parts, including a portion tied to the company's

overall results, another to the unit's results, and a final portion based on the individual's performance evaluation results. The HRM practices aimed at executives are confidential and negotiated with HRM employees with an equivalent position.

Development

The Strategic Innovation Unit of the company is dedicated to fostering the creativity and innovation of employees who work outside the unit. To do this, it promotes two ideation programs, one for strategic and the other for incremental innovation, that allows the registration of projects throughout the company. The registered projects of the strategic innovation ideation program are evaluated and selected, and those chosen can receive a budget for their development. In addition, the program provides the development of skills and innovation competencies (Kelley et al., 2011; O'Connor & McDermott, 2004), promotes the visibility of innovative employees (Fowinkel, 2014; Kelley et al., 2011), encourages intellectual experimentation (Zhang & Jin, 2014) and may result in career growth opportunities (Kelley et al., 2011). Thus, it can be considered a Strategic Innovation Unit's initiative to develop interdisciplinary innovation and talent management practices.

7.2.3.1 Case B1

The projects of Case B1 are more closely related to the initial stage of technology discovery and development. However, their development and application occur within the Technology and Strategy vice-presidency in pre-design and engineering areas related to each business unit of the company's products and services. The Technology Area's project portfolio is orchestrated and monitored by the Strategic Innovation Unit.

The Technological Area structure, focused on strategic innovation, was allocated to a management position within the company's Engineering and Technology vice-presidency, serving as an area for researching technologies for future scenarios. The other areas within the Engineering and Technology Unit were responsible for capturing the outputs from the Technological Area and applying them to the creation and development of strategic innovation projects for each business unit related to the organization's core business. However, the project development and management

areas, within the Engineering and Technology Unit, encompass all projects related to those business units, whether related to strategic innovation, incremental innovation, or new product development.

Strategic innovation employees are typically involved in multiple projects. Discontinued projects do not impact the careers of those involved, contrary to what was observed by the literature (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004). These individuals are reassigned to other projects, whether due to cancellation or the completion of the project. In Case B1, no perception of individual career risk related to the project's uncertainties was reported; this may be explained by the job security provided by this regular reassignment to projects (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011) and the strong alignment of the projects to the company's strategy (Choi et al., 2018).

Roles and positions

The Technological Area does not reach the TMT hierarchical level, but it has positions distributed across many hierarchical levels in partial accordance with the literature (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011).

HRM Practices

Talent management

Case B1's strategic innovation employees are highly skilled. However, layoffs may still occur due to market uncertainties such as competing company acquisitions, sales, and incorporations, with subsequent attempts to rehire those who were dismissed, which potentially affects the retention of strategic innovation talent, generating a perception of career risk (Fowinkel, 2014; Xiong et al., 2020).

Evaluation

The evaluation process is conducted autonomously by the Technological Area, with no involvement from HRM except for entering the results into the system and the overall format of the evaluation process, despite the presence of an HRBP in the area.

The goals of the performance evaluation of the Technological Area are all related to projects' milestones and cascaded from the leader's goals, which indicates the focus on what is under their control (Linder et al., 2015; Marx et al., 2016; O'Connor et al., 2018). These goals are valid for the entire group, defined and divided among the teams aligned between areas participating in the project (Marx et al., 2016). Each goal has an assigned responsible person, with a specified percentage of support from other team members. The progress towards these goals is monitored monthly, leading to a realignment of the goals and their distribution, providing the adjustment of metrics in case of the achievement of goals is hampered by uncertainties (Marx et al., 2016), and solving its impacts (Kelley et al., 2011). Since the goal is for the entire group and affects everyone, there is a high degree of collaboration among the team, which has been indicated by the literature on the use of collective rewards (Farouk et al., 2016; Hebda et al., 2012; Kelley et al., 2011; Marx et al., 2016), but not on collective goals, where no reward is involved.

The subjective evaluation is based on the individual's strengths and possible improvement aspects, as evaluated by those who have worked with them in the past year. The aspects evaluated as positive or negative do not have any previous delineation and, therefore, may not be based on their innovation competencies, as would be recommended (Foss & Klein, 2014; Kelley et al., 2011; Linder et al., 2015; Oltra et al., 2022). The selection of the evaluation participants is made by who is being assessed and her/his leader, which also indicates control and security over the assessment process despite this practice being indicated in the literature only for objective evaluations (Linder et al., 2015; Marx et al., 2016; O'Connor et al., 2018). The compilation of the responses is given as individual feedback in which there is freedom of questioning and argumentation between the parties. It was emphasized in the interviews that, in addition to formal feedback, behavior issues, and deliveries are individually aligned with the manager on a bi-weekly basis providing guidance and clear communication for continuous understanding and adjustments (Kelley et al., 2011; Marx et al., 2016).

The individuals working in Case B1 affirmed to proactively seek to overcome HRM practices barriers to align them with their work. For instance, they request and provide direct feedback to their colleagues on improvement points without incorporating them into the system so that their evaluation score is not impacted. They also prefer bi-weekly feedback instead of an annual and are open to adjusting their goals when necessary. They have regular discussions and alignments with their manager regarding the results before entering them into the system. Additionally, they argue that the HRBPs do not have enough knowledge about their work to support them effectively.

Rewards

The incentives for people working with strategic innovation in Case B1 are mainly intrinsic, as was also observed by Shaikh & O'Connor (2020). The only financial reward received is the distribution of profits linked to the evaluation results. There is an emphasis on training and development, with support and time granted for attending courses and conferences related to their work at the company. Impact work such as generating ideas, producing patents, contributing to documentation, and sharing knowledge on internal systems is recognized and valued.

Development

The company's HRM offers potential for career development for the Technological Area's employees interested in acting as specialists, as indicated by (O'Connor et al., 2018). However, it does not offer executive career paths, as seen in Case B2.

The company has a system of individual development plans in which each employee's development goals are established and can include job rotation, postgraduation courses, training, attending conferences and readings, and developing strategic innovation competencies (Kelley et al., 2011; O'Connor & McDermott, 2004). The plan is set according to the employee's career aspirations, aligned with the company's objectives. The company strongly encourages employees to pursue courses as part of their individual development plan and grants them time off for it. Typically, the employee pays for the courses in the plan, but the company may

contribute partially. However, there have been reports that the company has reneged on its decision to pay for courses that were included in the employee's individual development plan and voluntarily agreed to finance, causing individual uncertainty about whether they can afford the expense at the time or not, which may discourage strategic innovation employees (Hebda et al., 2012).

7.2.3.2 Case B2

The organizational structure of the Strategic Innovation Unit, the Innovation and New Business vice-presidency, dedicated to strategic innovation management, presented the potential to provide the organization with the position of CIO. Within the Strategic Innovation Unit are four sectors: the Innovation Strategy Area, the Digital Transformation Area, the New Business Area, and the Accelerator Area. The Innovation Strategy Area is responsible for orchestrating strategic innovation projects from the Technological Area, nurturing an innovation culture and programs for ideation and the development of strategic innovation projects within the company, and promoting and managing the organization's corporate venture capital. The Digital Transformation Area aims to meet the internal demands of the company for digital processes. The New Business Area focuses on developing new businesses that have not yet been able to adapt to the company's established processes. Meanwhile, the Accelerator Area operates more independently, although supported by the governance of the parent company, in incubating more radical strategic innovation opportunities in the form of startups.

The Strategic Innovation Unit presents a flat structure that reaches the TMT level, strengthening the interaction of the Strategic Innovation Unit with the TMT's members. It has positions distributed across the TMT, managerial, and analyst hierarchical levels in accordance with the literature (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011). However, the arrangement of positions appeared to be incompatible with the roles performed. Those who reported to the Strategic Innovation VP held senior management positions, with subordinates who were analysts. All of them, including the analysts, perform key strategic innovation activities involving assignments such as leading innovation committees, cross-departmental discussions, and aligning the strategic innovation

portfolio, promoting the strategic innovation legitimation and the innovation culture throughout the company, including executives. Their work activities involve creating, implementing, and developing innovation programs and events, open innovation, and creating corporate venture capital funds, to cite a few examples.

Therefore, despite Case B2 involving formalized managing procedures and structures (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017) and legitimate roles and positions (O'Connor et al., 2018), there is a lack of coherence between the performed roles and the positions assigned to them by HR, which probably impacts on their incomes. Accordingly, companies must be aware of the misalignment between the individual perceived contribution to the organization and its recognition (Hebda et al., 2012), which the seniority of their job title might represent.

The career development of the employees who lead the strategic innovation opportunities through the intra-entrepreneurship ideation program experience is usually accompanied by a high perception of career risk caused by the possibility of project cancellation, as highlighted by the literature (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004), and the high association of the project to the individual initiative (Choi et al., 2018). This perception is reduced by the assurance of job security (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011) transmitted by the Strategic Innovation Unit, which is enabled by the autonomy and legitimacy that the area has in the company.

In this case, the perception of career risk can be intensified by the intrapreneurship program being able to attract employees from any area of the company and promote them to the position of leader of its strategic innovation project, thus involving a change of the area of activity and the high investments in the project idealized by the individual. However, the committee that approves and evaluates the project and the strategic innovation management process seeks to promote the strategic alignment of opportunities with the company's strategic intent and, thus, can reduce the weight of project failure on the individual's career.

In startups that are part of the Accelerator Unit, the HRBP is an integral part of the team in which they operate, attempting to balance the traditional company culture with a startup culture. Thus, the attempt to maintain a startup mindset is supported by the enterprise's structure. Additionally, in Startups B1 and B2, it was reported great

apprehension concerning their career among individuals related to the cancellation of the project, the inability to spin off the startup, and even after its spin-off, the possibility that it may not succeed. This is in line with what has been reported in the literature (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004) and may be related to a complete affiliation of the employees to a single opportunity that involves very high uncertainties, for which there is still no established market, technology, or regulation.

HRM practices

Talent management

In Case B2, a growing concern was observed regarding the attraction and retention of strategic innovation talent, leading the Strategic Innovation Unit to seek solutions with the HRM department. In response, they have created an Innovation Executive position for those who lead the Acceleration Unit opportunities and are in the process of creating career paths for developers, data scientists, and user experience professionals, which are the positions with more significant turnovers. For employees working in Startups B1 and B2, the HRM practices tend to be more closely aligned with those used by startups. Thus, it is possible to state that strategic innovation employees who actuate at the Acceleration Unit and the digital work-based careers are being stimulated by talent management to retain those professionals (Aagaard, 2017; Kelley et al., 2011; Marvel et al., 2007).

Therefore, the HRM faces the challenge of understanding the most updated and appropriate methods of personnel management in the face of many uncertainties and digital transformation and uses concepts closely related to software development as possible solutions for the challenges of strategic innovation as a whole, emphasizing their focus on solutions brought by established market practices.

Notwithstanding, strategic innovation management can involve new products, whether for large-scale production or unique projects, as well as new business opportunities and the development of digital platforms. We highlight that among the mentioned examples, there is a wide range of different possibilities. For each of these opportunities, the common point relies only on the high uncertainties involved and the complexity of the projects. Thus, their demands can be completely distinct.

Despite HRM's genuine attempt to create appropriate practices, it is possible to cite some examples of how they may or may not be suitable for strategic innovation roles. For example, fostering squad work may well serve for the projects developed by Cases B1 and B2, digital transformation opportunities, and new businesses developed in Startups B1 and B2, as they are a small and flexible group of cross-functional individuals responsible for developing and delivering a product or service, a formation of teams commonly reported by employees who work closer to the development of projects and opportunities in Cases B1 and B2 in the interviews.

Conversely, the "agile mentality" expression emerges from the Agile Manifesto[1], created in 2001 by software developers to uncover better ways of developing software. The manifesto's primary values are individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan. Although the values of this manifesto have many points in common with the strategic innovation management's demands, such as the prioritization of individuals and interactions over processes and tools and responding to change over following a plan, the value related to customer collaboration may be opposed to the creation of new market platforms, once there may be no existing market during the development of a strategic innovation opportunity.

Hence, the use of terms borrowed from manifestos and consultancies that frequently appear presenting incremental changes or repackaging of well-established forms of organization and management, already established for decades for corporations such as the transportation company, for specific cases like startups and digital technologies can be tricky for functional areas like HRM, which does not have a historical knowledge of production, project, and service management, causing confusion and, at the limit, impacting forms of organization that are already validated in established companies. For instance, HRBP B1 stated that the project squads maintain the same members from start to finish, which would indicate the development of short-term projects. However, this is neither compatible nor the reality of the strategic innovation projects from Cases B1 and B2, which often involve technologies focused on future scenarios or developing technologies with lower TLRs.

[1] The Agile Manifest can be found at https://agilemanifesto.org/.

Thus, despite the Strategic Innovation Unit's requirements for the HRM to create executive and specialist career paths for strategic innovation employees (Marvel et al., 2007), these careers are designed specifically for a small set of strategic innovation employees. The individuals who work outside the Acceleration Unit and the Digital Transformation Area, whether they are part of the Strategic Innovation Unit or the Technological Area, seem not to be yet recognized as part of this body of strategic innovation talent professionals who face issues related to uncertainties and bring high strategic innovation skills.

The Strategic Innovation Unit analysts, for instance, regardless of not being able to demand positions compatible with their roles, perhaps due to their lower power positions from an HRM perspective, perform high complexity roles on the orchestration of strategic innovation projects, having constant contact with the company's TMT members from different areas. The LinkedIn profile of the five strategic innovation analysts was identified and analyzed. According to their profiles, 80% have more than ten years of career experience, mainly in innovation and engineering. Some of them hid the word analyst in their public resumes. In contrast, others describe in their profiles that, despite the analyst position, they act as the head of a program, the leader of an initiative, or the responsible for the organization's innovation culture, indicating a misalignment between the perceived contribution and their formal positions. However, for Innovation Analyst B1, the possibilities of expanding the Strategic Innovation Unit and eventually taking on opportunities to be explored in the Accelerator Area, and thus obtaining development for an executive career, are the great motivators for their retention in the current position.

In Startup B2, which has more employees who work as programmers and related areas, as it develops a digital platform, it was declared that, in the hiring process, the employees preferred a working relationship in the form of a personal legal entity or outsourced by a third company, manifesting an aim for autonomy, flexibility, remote and asynchronous work, which are intrinsic rewards. A high number of employees not linked to the enterprise led to a concern about some restrictions related to the level of access to organizational systems of this part of the workforce. Therefore, to promote actions for the integration of these employees and overcome these limitations, which create a dependency between the groups of employees for the work to be performed and may generate friction between employees, the Innovation Director

B3 opted to use alternative forms of sharing information and documents, avoiding the use of organizational platforms, which highlights the need to capture and circumvent HRM-related issues.

The startup employees also requested from the HRM differentiated rewards practices, which is in line with what has been reported in the literature (Marvel et al., 2007). Some examples are working four days a week, having a flexible benefits package, the day off on their birthday, as well as a rate of partnership participation attached to their salary as an extrinsic reward, which is under review and being negotiated with the parent company for one of the startups and is already established in the other.

Evaluation

The evaluation process for the Strategic Innovation Unit includes individual and team goals, with 80% of the goals being individual and 20% being team goals. The team goal was set by the VP of the Strategic Innovation Unit's goal and was not related to the work of all employees in the area for that year. The employees define individual goals in conjunction with their direct superior and are cascaded from the leader's goals. The individual goals are related to the employee's work, in accordance with the literature (O'Connor et al., 2018; Marx et al., 2016), but there is a strong dependence on the work of third parties. These goals can be reviewed throughout the year, as indicated by (Marx et al., 2016). A 360 degrees behavioral analysis is conducted by those who work directly with the individuals and is directly related to their work activities. However, the result of this evaluation seems to be undervalued by employees in the area. The result of the appraisal is the individual development plan, set by the individual with the approval of their superior and formal feedback. A bi-weekly informal 1:1 feedback session is provided for work and behavior alignment.

The evaluation process for managerial positions in the startups from the Acceleration Area is based on factors such as know-how, problem-solving, and accountability, which may be related to innovation competencies, as suggested by literature (Kelley et al., 2011; O'Connor & McDermott, 2004). The individual development plan is increasingly becoming streamlined and informal, along the same line as the employees from the Strategic Innovation Unit. The succession plan is

discussed with employees during feedback meetings, and the career progression is simplified, valuing the individuals over their job positions.

Rewards

In Case B2, rewards were mostly related to intra-entrepreneurship opportunities within the company, as Shaikh & O'Connor (2020) stated, either through the ideation program developed and promoted by the Strategic Innovation Unit or the innovation executive career within the Accelerator Area. Besides, employees who opt for a legal entity work contract can obtain differentiated intrinsic rewards valued by them, such as autonomy, flexibility in working hours, and asynchronous work. It was also identified that managers have control over rewards to be distributed in their areas of responsibility, as stated in the literature (Hebda et al., 2012; Kelley et al., 2011).

Additionally, Startups B1 and B2 are already experimenting, or close to it, with the possibility of obtaining financial rewards for employees, apart from the innovation executive who already has this prerogative. Therefore, it can be considered that there are differentiated rewards for strategic innovation employees (Aagaard & Andersen, 2014; Andreeva et al., 2017; Koberg et al., 1996; O'Connor et al., 2018; Urban & Verachia, 2019), including individual rewards that encourage intellectual experimentation and long-term success (Zhang & Jin, 2014).

Development

As a development practice, it was identified that employees in the Strategic Innovation Area have the possibility and expectation to grow toward a career focused on strategic innovation management in the company. This possibility may be perceived due to the high visibility of their positions, which works across the company, within several innovation committees in which executives participate, and the close proximity to the VP of the Strategic Innovation Area, as suggested by Fowinkel (2014).

7.3 CROSS-CASE ANALYSIS

The comparative analysis of the cases discussed will be presented below, grouped between the factors related to the legitimation of strategic innovation in companies, in Session 5.6.1, and to HRM practices, in Session 5.6.2.

7.3.1 Strategic Innovation Legitimation

All cases intentionally and systematically develop innovation projects and opportunities beyond the incremental, with the expectation of long-term results. In Cases A1 and A2, the company is a pharmaceutical industry able to estimate the market for a specific pathology. The strategic targets were defined based on the potential market of the diseases, some of which do not yet have existing pharmacological treatments, thus creating new business lines for the company and the market. Case B1 seeks and develops technologies to be used in projects estimated for future scenarios of decades ahead, which may encompass significant alterations to existing businesses or the development of markets that do not yet exist but focus on the company's core business. While the projects developed in Case B2 aim to develop new business opportunities for the company as they distance themselves from the company's core business and the markets in which they aim to operate, which do not yet exist in the form of the Accelerator Unit's startups propose.

Strategic innovation capability development involves formalized managing procedures and structures (Kanchanabha & Badir, 2021; Kelley et al., 2011; Marvel et al., 2007; Marx et al., 2016; O'Connor et al., 2018; Seeck & Diehl, 2017), legitimate roles and positions (O'Connor et al., 2018), and TMT's formal and direct involvement and support (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016). The analyzed cases fully meet those fundamental characteristics, as shown in Table 16.

Table 16: Data analysis of the essencial characteristics of strategic innovation-related HRM.

Case	Formal procedures, structure, roles, and positions	TMT's formal and direct involvement
A1	Yes, Strategic Innovation Unit within Innovation Unit	Yes, through the board and executive innovation committees
A2	Yes, Strategic Innovation Unit	Yes, through the board and executive innovation committees
B1	Yes, Technological Area, within Technology and Strategy vice-presidency	Yes, through various innovation committees
B2	Yes, Strategic Innovation Unit and Acceleration Area	Yes, through various innovation committees and the agency of corporate governance in the startups from the Accelerator Unit

Source: designed by the author.

The existence of formalized managing procedures for strategic innovation can be exemplified by the predefinition of the innovation strategy, which directs the composition of the companies' strategic innovation portfolio and the perennial presence of diverse innovation committees in all cases that monitor and actuate on strategic innovation initiatives and innovation programs within the companies. These are representatives of formal strategic innovation management and the TMT's direct and formal involvement and support.

All cases presented a formal organizational structure for strategic innovation. Cases A2 and B2 are directly connected to the respective companies' presidencies, which shows a greater power of political influence due to their representation on the executive board. Meanwhile, the structure of strategic innovation in Cases A1 and B1 is strongly linked to areas related to incremental innovation and new product development. An organizational structure of strategic innovation formally allocated in the company's hierarchy entails the appointment of roles and positions aimed at its development. Accordingly, all cases also have shown to have formalized roles and positions dedicated to strategic innovation management, which will be analyzed in detail afterward.

Career risk perception

The literature's premises on career risk perception of strategic innovation employees presents several motivators for its increase and decrease. It may be related to projects' failure (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott,

2004; Oltra et al., 2022); the lack of different incentives for strategic innovation teams (Bruneel et al., 2012; O'Connor & McDermott, 2004), the dependence of the project success to grant bonuses and promotions (O'Connor & McDermott, 2004), and cyclic and recent organization's restructures (Fowinkel, 2014); and may be diminished by tolerance for early failure (Fowinkel, 2014; Shaikh & O'Connor, 2020; Zhang & Jin, 2014); job security through the guarantee of attractive relocation within the company (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011); the reduction of the visibility of failed projects in the organization; the raised recognition, identification and selection of employees with experience in strategic innovation to lead strategic innovation projects (Kelley et al., 2011); and the association of strategic innovation projects to the company's strategy and not to individual initiative (Choi et al., 2018). The data relating to the career risk perception of strategic innovation employees are detailed in Table 17.

Table 17: Data analysis related to strategic innovation employees' career risk perception.

Case	Perceived career risk	Possible causes and barriers of career risk perception
A1	No	• Careful consideration before canceling a project with the participation of strategic innovation managers and the TMT, preventing the link of project failure to an individual's work. • Projects are linked to strategy through predefined strategic targets.
A2	No	• Careful consideration before canceling a project with the participation of strategic innovation managers and the TMT, preventing the link of project failure to an individual's work. • Recent organization's restructure and change in its strategy. • Projects are linked to strategy through predefined strategic targets.
B1	Yes	• Discontinued projects do not impact the careers of those involved, as these individuals are reassigned to other projects, whether due to cancellation or the completion of the project. • Recent a layoff based on the company's acquisition. • Job security is provided by the regular reassignment to projects. • Projects are linked to strategy through predefined innovation drivers.
B2	Yes	• Strategic innovation employees reported career risk perception related to project discontinuity, especially among strategic innovation employees who are directly related to higher uncertainty projects. • Job security is guaranteed by HR and strategic innovation leaders. • Projects are linked to strategy through predefined innovation drivers.

Source: designed by the author.

Only Cases B1 and B2's interviewees presented a perception of risk in their careers. However, although the interviews for Cases A1 and A2 did not capture this career risk perception, the high turnover among innovation executives identified in the comparative analysis may indicate a career risk perception among those innovation positions.

Just Case B2 posed a career risk perception led by projects' failure, as foreseen by the literature (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004). In this case, the possibility of discontinuing projects with higher uncertainties, such as the startups from the Accelerator Area and the projects that emerge from the company's internal program for ideation and development of strategic innovation, raises the fear of career impact among strategic innovation employees who are directly and solely related to them.

The loss of all the company's innovation executives in a few years between Cases A1 and A2 may have been caused by a high career risk perception which may be explained by the recent restructure of the organization and cyclic change of the organization's strategy, indicated by Fowinkel (2014) as a cause of an increased perception of career risk, and the decrease the number of available positions for career development opportunities for these executives in innovation, in other words, a lack of job security provision through the guarantee of attractive relocation within the company (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011). Case B1 also suggested a raised career risk perception justified by a recent layoff based on the company's acquisition.

All cases presented a strong link of the strategic innovation portfolio with the company's strategic intent defined by their corporative governances; in Cases A1 and A2, innovation projects follow strategic pathology targets, and in Cases B1 and B2, they are guided by innovation drivers, both defined by the company's strategy, which may diminish the career risk perception of strategic innovation employees by decoupling the projects' success or failure from their leaders on an individual basis, as highlighted by Choi et al. (2018).

In Cases A1 and A2, the careful consideration before canceling a project with the participation of strategic innovation managers and the TMT prevented the link of project failure to an individual's work, as claimed by the literature (Kelley et al., 2011;

Marvel et al., 2007; O'Connor & McDermott, 2004), and, consequently, the possibility of impacting one's career.

Cases B1 and B2 provided job security to strategic innovation employees, as indicated by the literature, as a possible reducer of career risk perception (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011). In Case B1, job security is provided based on the regular reassignment of strategic innovation employees to projects. While in Case B2, job security is informally assured by strategic innovation, and HR leaders are directly responsible for the opportunities for strategic innovation employees who address this concern to them.

In Case B2, it was observed that the raised recognition, identification, and selection of employees with experience in strategic innovation to lead strategic innovation projects, as indicated by Kelley et al. (2011), to perform the Innovation Executive's role and lead a startup of the Accelerator Unit.

A lack of different incentives for strategic innovation teams (Bruneel et al., 2012; O'Connor & McDermott, 2004) was identified in Cases A1, A2, and B1 and for a specific group of strategic innovation employees in Case B2. However, it was not associated with a career risk perception in the interviews.

None of the cases conditioned the grant bonuses and promotions to the success of projects (O'Connor & McDermott, 2004), formally yielded tolerance for early failure (Fowinkel, 2014; Shaikh & O'Connor, 2020; Zhang & Jin, 2014), or the reduction of the visibility of failed projects in the organization (Kelley et al., 2011).

Therefore, it was observed in the cases of this research that the perceived career risk associated with strategic innovation might be related to projects' failure (Kelley et al., 2011; Marvel et al., 2007; O'Connor & McDermott, 2004; Oltra et al., 2022), and cyclic and recent organization restructures (Fowinkel, 2014); and it may be diminished by job security through the guarantee of attractive relocation within the company (Fowinkel, 2014; Kelley et al., 2011; Probst et al., 2011); the raised recognition, identification, and selection of employees with experience in strategic innovation to lead strategic innovation projects (Kelley et al., 2011); and the association of strategic innovation projects to the company's strategy and not to individual initiative (Choi et al., 2018).

Thus, the research results related to the career risk perception of strategic innovation employees in established organizations led to Proposition 1:

P1: *The perceived career risk of strategic innovation employees in established companies may be associated with frequent organizational restructures and fear of project's failure when they are linked to a single strategic innovation project or opportunity, and may be diminished by the provision of job security through attractive relocation options, recognition and selection of experienced strategic innovation employees to lead strategic innovation projects and opportunities, and the alignment of strategic innovation projects with the company's strategy.*

Strategic innovation roles and positions

The literature's assumptions related to strategic innovation roles and positions address the size and composition of the strategic innovation team (Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004), the need for a wide distribution of strategic innovation positions across the hierarchical levels of the organization (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011), including an experienced TMT member dedicated to strategic innovation (O'Connor et al., 2018) and the advantages of a CEO and TMT members with innovation expertise (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017) and varied knowledge and competences (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014). The research data related to strategic innovation roles and positions are shown in Tables 18 and 19.

Table 18: Data analysis related to strategic innovation roles and positions.

Case	Strategic innovation team is a small group of cross-functional employees	Positions on diverse hierarchal levels of the organization	Presence of a CIO
A1	There were less than 20 positions related to strategic innovation, but the team was not cross-functional.	Yes, from the TMT to analysts. However, the senior executive position did not work exclusively with strategic innovation.	No
A2	There were less than 20 positions related to strategic innovation, but the team was not cross-functional.	Yes, from the TMT to analysts.	No. Despite the position that provided the possibility of acting in the role of CIO, it was necessary to allocate an individual with experience and competence in strategic innovation, in addition to a focus on strategic innovation that was not diverted by short-term demands.
B1	There were about 150 positions related to strategic innovation in the Technological Area, and the team was not cross-functional.	Yes, from the TMT to analysts. Although the senior executive position did not work exclusively with strategic innovation	No.
B2	The Innovation Strategy Area held about six members, but the team was not cross-functional. While the startups' teams from Accelerator Area were cross-functional, they varied greatly in size. Startup B1 employed about 100 people, and almost 40 individuals formed Startup B2's team.	Yes, from the TMT to analysts.	Yes

Source: designed by the author.

The strategic innovation team's composition differed considerably across cases, indicating that it was not always formed by a small group of cross-functional individuals, as suggested by the literature (Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004). This can be explained by the nature and scope of the work performed by the team, whether the team is responsible for the discovery,

development, or orchestration phase of the company's portfolio of strategic innovation projects or the complete execution of a strategic innovation opportunity.

Regarding the size of the strategic innovation team, in Cases A1, A2, and the Innovation Strategy Area of Case B2, the strategic innovation team was small, with less than 20 positions. Cases A1 and A2 were related to the discovery stage of strategic innovation and the Innovation Strategy Area Case B2 to the alignment and orchestration of the strategic innovation portfolio with the organization's innovation strategy and its promotion throughout the company. Conversely, Cases B1 and the startups from the Accelerator Area of Case B2 presented from 30 to hundreds of people, as in Case B1, the Technological Area aims to supply new technologies to five different business areas of the company for up to four decades in advance, and in the Case B2's startups, the strategic innovation team needs to encompass positions to fulfill all the startup's needs, which become increasingly complex. Thus, except for the startups in the Accelerator Area of Case B2, none of the strategic innovation teams were cross-functional.

All the cases presented positions on diverse hierarchal levels of the organization, as recommended by the literature (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011). However, in Cases A1 and B1, despite having positions that reached the companies' TMT, this role was also responsible for incremental innovation and new product development, not working exclusively with strategic innovation.

In Cases A2 and B2, in which the TMT position of strategic innovation's senior executive or VP was dedicated to the Strategic Innovation Unit, it was detected a CIO's position in the TMT, as indicated by O'Connor et al. (2018). In Case B2, the CIO position was filled by someone experienced in strategic innovation and exclusively dedicated to strategic innovation projects. However, in Case A2, although there briefly was a person who met the requirements to act as a CIO occupying the TMT position, after he departed from the company, this position was occupied by an individual who did not meet these conditions and, additionally, have concomitantly undertook another position related to incremental innovation, which deviates from what is recommended by the literature to enhance the strategic innovation capability and protect its portfolio (Bruneel et al., 2012; Chung & Kang, 2019; Cummings & Knott, 2018; Daellenbach et

al., 1999; de Visser & Faems, 2015; Garms & Engelen, 2019; Goodall & Pogrebna, 2015; Koch et al., 2017; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014).

Hence, the analyzed data were consistent with the literature about positioning strategic innovation roles through diverse hierarchal levels of the organization (Bruneel et al., 2012; Cortes & Herrmann, 2021; O'Connor et al., 2018; Probst et al., 2011). The presence of a Chief Innovation Officer (O'Connor et al., 2018) was observed only in the transportation company. Nevertheless, the strategic innovation team size and composition varied greatly between cases, being the data inconsistent with the literature's evidence of a small group of cross-functional individuals (Kelley et al., 2011; O'Connor et al., 2018; O'Connor & McDermott, 2004).

Table 19: Data analysis related to TMT roles aimed at strategic innovation.

Case	CEO with innovation expertise and varied functional knowledge and competences	Strategic innovation's TMT members with innovation expertise and varied functional knowledge and competences
A1	Yes	No
A2	No	No
B1	Yes	Yes
B2	Yes	Yes

Source: designed by the author.

At the beginning of Case A1, there was a CEO with some experience related to innovation and other business areas. Interviewees mentioned him as the person who leveraged the capacity to innovate strategically in the company and was responsible for creating an area focused on strategic innovation. However, later in Case A1 and through Case A2, the person who assumed the position of CEO did not have any innovation-related experience, having worked only on commercial-related and financial areas, both focused on short-term results. During the legacy of CEO A2, it was observed a change in the innovation strategy to an innovation agility strategy, structural changes in the scope of work of the strategic innovation area when the Strategic Innovation Unit reached the TMT level; changes in the HRM's evaluation system; and a remarkably high turnover of innovation executives, in which 38% of the strategic innovation directors and managers departed from the organization, and 100% of the Innovation Unit's executives have left the organization. In both Cases A1 and A2, the

TMT did not have executives experienced in innovation, not even among those who were executive directors of the Innovation Unit, in Case A1, and of the Strategic Innovation Unit, in Case A2.

In Cases B1 and B2, the CEO was experienced in innovation and several organizational functions. Interviewees referenced him as someone who promotes and supports the company's strategic innovation management and innovation culture. In these cases, the TMT has executives with experience in strategic innovation and other areas of activity in the transport sector and other sectors, as is the case with the VPs of the areas that develop strategic innovation. As a company focused on technology and engineering, there may be other executives in TMT with experience in innovation.

Therefore, selecting CEOs and members for the TMT with innovation expertise (Bruneel et al., 2012; Cummings & Knott, 2018; Daellenbach et al., 1999; de Visser & Faems, 2015; Goodall & Pogrebna, 2015; Koch et al., 2017) and varied functional knowledge and competences (Chung & Kang, 2019; Garms & Engelen, 2019; O'Connor et al., 2018; Sandberg & Aarikka-Stenroos, 2014) may enhance the development of strategic innovation in established companies, as it was observed in most of the analyzed cases, although this is the reality in only about 13% of the most innovative companies in Brazil and the world, as depicted in Figure 11 from Session 5.2.2.

Thus, the research findings concerning strategic innovation roles and positions within established organizations resulted in the formulation of Proposition 2:

P2: *Strategic innovation roles should be positioned through diverse organizational hierarchal levels of established innovative companies, including the top-management team. The selection of CEOs and top-management team members with innovation expertise and diverse functional knowledge and competencies can benefit the development of a robust strategic innovation capability in these organizations.*

Hence, the legitimization of strategic innovation was observed in the analyzed cases mainly due to formal managing procedures and structures, legitimate roles, and positions, and especially by the TMT's formal and direct involvement and support, as they are who enable the creation and maintenance of innovation as a function of the company. Therefore, positioning strategic innovation roles through diverse hierarchal levels of the organization, the presence of the role of CIO, and selecting CEOs and

TMT members with innovation expertise and varied functional knowledge and competencies can be decisive in the maintenance and growth of the strategic innovation function.

However, this function's good performance requires retaining employees who engage in strategic innovation roles and have the necessary skills and knowledge for the company's strategic innovation project management. For that, it is essential to reduce the perception of career risk. A career risk was perceived as linked to strategic innovation projects' failure when employees were closely tied to a single project with high uncertainty and frequent organizational restructures. While factors that decreased this perception included job security, raised recognition of employees experienced in strategic innovation to lead innovation projects, and the association of innovation projects with the company's strategy.

7.3.2 HRM practices

The study of HRM practices in established companies that develop strategic innovation systematically led to a broad analysis of the talent management, assessment, rewards, and development systems for strategic innovation employees.

The underlying assumptions of the literature regarding HRM practices delve into HRM practices' characteristics (Aagaard & Andersen, 2014; Andreeva et al., 2017; Kelley et al., 2011; Koberg et al., 1996; Marx et al., 2016; O'Connor et al., 2018; Urban & Verachia, 2019) that should be the focal point on the development of employees' strategic innovation competences (Kelley et al., 2011; O'Connor & McDermott, 2004) and the strategic innovation employees' initiatives towards the HRM (Aagaard, 2017; Fowinkel, 2014; Marvel et al., 2007). The data concerning the HRM topics analyzed in the cases are displayed in Table 20.

Table 20: Data analysis related to HRM practices and strategic innovation.

Case	Claim for personalized support from the HRM	HRM practices characteristics	Proactively define their own metrics to be assessed
A1	Yes, a specialist career.	Provide guidance, clear communication, and alignment through rich feedback.	Yes, with the employee leader's approval.
A2	Yes, the application of the specialist career for strategic innovation employees.	Provide guidance, clear communication, and alignment through rich feedback.	No, the goals became for the entire innovation area and unrelated to strategic innovation assignments.
B1	No, a distaste of the strategic innovation employees was identified for the HRM's performance.	Develop strategic innovation competencies, and provide guidance, clear communication, and alignment through rich feedback.	Yes, defined by the team leader and divided along with the strategic innovation employees.
B2	Yes, the creation of new roles, careers, and differentiated intrinsic and extrinsic rewards, in the case of startups' employees.	Provide differentiated incentive practices that develop strategic innovation competencies, and provide guidance, clear communication, and alignment through rich feedback.	Yes, with the employee's leader.

Source: designed by the author.

In most cases, A1, A2, and B2, it was confirmed that strategic innovation employees claimed personalized support from the HRM, as stated by Marvel et al. (2007). In Case A1, strategic innovation managers and coordinators were insistent on requesting a career as an innovation specialist for the Strategic Innovation Unit. By the time of Case B2, the specialist career for strategic innovation employees had been achieved in Case A2, but it was still applied to only one employee in the area, and the team pleaded for expansion by then. In Case B2, the Strategic Innovation Unit consistently demanded the HRM for differentiated practices aimed at specific strategic innovation employees. Nevertheless, in Case B1, the strategic innovation employees of the Technological Area declared to mistrust or discredit the HRM's support for their distinguished needs, choosing to circumvent possible points of attention in HRM practices internally. The lack of understanding of the nature of Technological Area's work and a history of unmet expectations drove the area to tailor the evaluation system in a way that made their work somewhat unattainable for the HRM, avoiding the HRM to act strategically in the area and relegating them to a strictly technical activity regarding the evaluation system.

For scholars, the HRM practices aimed at strategic innovation, employees should develop strategic innovation competencies (Kelley et al., 2011; O'Connor & McDermott, 2004) through differentiated incentives and evaluation practices to enhance innovation (Aagaard & Andersen, 2014; Andreeva et al., 2017; Koberg et al., 1996; O'Connor et al., 2018; Urban & Verachia, 2019), providing guidance (Kelley et al., 2011), clear communication and alignment when it is needed (Marx et al., 2016) through rich feedback. From these recommendations, only guidance, clear communication, and alignment through rich feedback were identified in the HRM practices of all cases; and Case B2 was the only representative, albeit only for specific positions, of the occurrence of differentiated incentives for strategic innovation employees.

Effectively, beyond the formal annual feedback given by the end of the evaluation process, strategic innovation employees stressed about the high frequency in which individual feedback and alignment meetings were held and its importance in adjusting and suppressing individual performance and project uncertainties.

HRM practices were observed to have a significant role in developing strategic innovation competencies in Case B1. This was achieved through a robust individual development plan, which stimulated the expansion of technical and management knowledge among strategic innovation employees. The individual development plan included the provision of time for the completion of courses and demanded the fulfillment of the plan's objectives. This indicates the recognition of the importance of the continuous nurture and update of strategic innovation competencies in the Technological Area, which is consistent with its the specialized technical nature.

While in Case B2, the HRM practices developed strategic innovation competencies through the promotion of strategic innovation distinguished positions, roles, and careers that enable intrapreneurship opportunities and promote talent retention. This development approach based on the provision of opportunities demonstrates an effort to cultivate, recognize and retain employees who demonstrate outstanding strategic innovation management capabilities within the organization. The demand for the creation of a specific role related to strategic innovation for HRM suggests that the Strategic Innovation Unit of Case B2 identified the need for differentiated expertise for the development of strategic innovations with more significant uncertainty and entrepreneurial abilities. These results indicate that the

promotion of strategic innovation executive careers fosters the continued engagement and commitment of strategic innovation employees to the organization.

In most cases, it was noticed that strategic innovation employees proactively defined their own metrics to be assessed (Aagaard, 2017; Fowinkel, 2014). The only exception was Case A2, in which the individual goals were abolished and replaced by team goals unrelated to the strategic innovation activities. In Cases A1, B1, and B2, the metrics derived from the leader's goals and were related to the employees' activities, focusing on what was under the individual or team's control (Linder et al., 2015; O'Connor et al., 2018).

The strategic innovation teams showed to systematically overcome some difficulties related to HRM's aspects independently. For instance, in Case A1, the non-managerial strategic innovation employees were informally evaluated by their superiors, as the formal process was not directed to them yet. In Case A2, the individual objective goals have been defined and evaluated internally and informally, although this performance assessment no longer exists in the HRM system. In Case B1, the strategic innovation employees often opt for giving critical feedback and alignment personally instead of inserting negative aspects about their colleague's work in the competence evaluation form to avoid impacting their final assessment result. Lastly, in Case B2, difficulties related to access to the company's system due to the high occurrence of contracts with legal entities and outsourced workers were circumvented by using alternative systems to which all employees could have equal access. Therefore, it is possible to affirm that strategic innovation employees proactively create strategies to overcome obstacles they identify in the company's HRM systems that hinder the development of strategic innovation management.

Hence, it was observed that strategic innovation employees claim HRM personalized support (Marvel et al., 2007) in most cases. HRM practices are used to provide guidance (Kelley et al., 2011), clear communication and alignment (Marx et al., 2016) through rich feedback in all cases, develop strategic innovation competencies (Kelley et al., 2011; O'Connor & McDermott, 2004) in half of the cases, and provide differentiated incentive practices partially on one sole case to enhance innovation (Aagaard & Andersen, 2014; Andreeva et al., 2017; Koberg et al., 1996; O'Connor et al., 2018; Urban & Verachia, 2019). Additionally, in most cases, the strategic innovation area proactively defined its own metrics to be assessed and passed them for HRM to

execute (Aagaard, 2017; Fowinkel, 2014), and in all cases, they conceive strategies to overcome obstacles in the company's HRM systems that hamper the advancement of strategic innovation management.

Consequently, the research findings regarding HRM practices for strategic innovation employees in established organizations enabled the formulation of Propositions 3 and 4:

P3: *HRM practices are employed by strategic innovation leaders to offer direction, effective communication, and alignment, particularly through comprehensive feedback. HRM practices are often utilized to cultivate strategic innovation competencies. Differentiated incentive practices aimed at enhancing strategic innovation capability are infrequently employed by established innovative companies.*

P4: *Strategic innovation employees consistently assert the need for personalized HRM support and consistently develop strategies to overcome obstacles within the company's HRM systems that they sense hinder the progress of strategic innovation management.*

Talent management

The presuppositions of the literature concerning talent management and retention explore the need for a specialized talent management system to stimulate and retain strategic innovation employees (Aagaard, 2017), their involvement in their job design and decision-making roles (Katou & Budhwar, 2010; Oltra et al., 2022); the possibility of negative impacts on strategic innovation employees' retention caused by the absence of recognition of the individual's contribution to strategic innovation, or the misalignment between the perceived contribution and the size of the received rewards (Hebda et al., 2012); and a lack of connection between the organization's innovation strategy and the HRM systems, which leads the HRM to direct a universalist approach for strategic innovation's workforce (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022). The analyzed data from cases concerning talent management and retention aimed at strategic innovation employees are presented in Table 21.

Table 21: Data analysis related to talent management and strategic innovation.

Case	Specialized talent management and development	Strategic innovation employees' involvement in the job design and decision-making	Lack of recognition of the individual's contribution or misalignment between the perceived contribution and the reward size	Inclusive vs. exclusive approach
A1	No	Yes, strategic innovation managers operate at a tactical level, relying on the TMT's strategic decisions.	Yes, there was a mismatch between titles, roles, and hierarchical positions among non-executive strategic innovation leaders.	Exclusive
A2	Yes, the possibility of specialist career development	Yes, strategic innovation managers operate at a tactical level, relying on the TMT's strategic decisions.	Yes, there was a mismatch between titles, roles, and hierarchical positions among non-executive strategic innovation leaders.	Exclusive
B1	Yes, the possibility of specialist career development	Yes, strategic innovation employees were involved in innovation committees, influencing decision-making and the scope of their work.	Yes, strategic innovation employees were commonly demanded to afford developmental practices put into the individual development plan.	Exclusive
B2	Yes, exclusively for the Innovation Executive's role from the Accelerator Area.	Yes, especially managers and executives' empowerment in designing their work and making decisions.	Yes, for strategic innovation employees from the Innovation Strategy Area	Exclusive for strategic innovation employees from the Innovation Strategy Area and inclusive for the Accelerator Area.

Source: designed by the author.

In Cases A1, A2, B1 and in the Innovation Strategy Unit of Case B2, specialized talent management, development, and retention practices were not identified for strategic innovation employees, as was foreseen by the literature (Aagaard, 2017; Kelley et al., 2011; Marvel et al., 2007). In Cases A2 and B1, solely the possibility of developing a Y career was observed, that is, an innovation specialist career. Nevertheless, in Case B2, there was a concern about attracting and retaining the

leaders of the Accelerator Area's strategic innovation opportunities, as they are assuming positions that play a leadership role in a startup company that involves remarkably high uncertainties.

Concerning the strategic innovation employees' involvement in job design and decision-making, innovation managers in Case A1 seemed to have a role in job design and decision-making, which is consistent with existing literature on strategic innovation talent management (Katou & Budhwar, 2010; Oltra et al., 2022). However, the changes observed in Case A2, such as the alteration in the company's strategy concerning innovation, hierarchical structure, laboratory work scope, project platform focus, and executive turnover, suggest that these managers primarily operate at a tactical level and rely heavily on the periodically floating company's strategy, that is, in the TMT's decisions. In Case B1, strategic innovation employees actively and formally participate in some innovation committees, which may indicate some tactical influence on the scope of work and decision-making. The strategic innovation employees of Case B2, especially managers and executives, showed greater empowerment to design their work and decision-making, demanding HRM's engagement in creating positions and talent management practices for specific functions, arguing and negotiating with other areas and the enterprise's TMT members.

The impacts of a lack of talent management in most cases were made explicit by the high turnover of innovation executives and the coordinator of one of the strategic innovation laboratories between Cases A1 and A2, even after investments by the company's HRM in the executive development of some of the selected strategic innovation employees subsequently left the company, which may have impacted a sketched succession plan for the organization's Innovation and Strategic Innovation Units. In Case B1, strategic innovation employees have fewer retention problems, possibly because they are highly specialized in the sectors and technologies in which they work. However, talent in strategic innovation was commonly lost in layoffs that occasionally occur in the company and from which some were sought after to be rehired after some time. In the Innovation Strategy Area of Case B2, employees showed, despite their hopes for future opportunities with the growth of the Strategic Innovation Unit, a certain insecurity about having an enduring career in the company if this does not occur.

In all cases, a lack of recognition of the individual's contribution to innovation or a misalignment between the perceived contribution to the company and the reward size (Hebda et al., 2012) was perceived. In Cases A1 and A2, there was an unequal allocation of individuals in positions of the same hierarchical level, which implies a salary differentiation, despite the fact that they perform very similar roles. Similarly, in Case B2, all the strategic innovation employees from the Innovation Strategy Area seemed to perform roles with much higher complexity levels than their titles, manager, and analysts. At the same time, this same team ensured proper HRM practices and job security for the strategic innovation employees from the Accelerator Area and strategic innovation project leaders from the company's ideation program. In Case B1, the strategic innovation employees from the Technological Area are encouraged to seek continuous specialization in their areas of activity in the company, having as goals the completion of these courses and training, which can range from a workshop to a *stricto sensu* postgraduate course, having to, in most cases, bear the costs of these activities. This practice becomes even more problematic considering that there are no competing companies in the sector in Brazil where these highly specialized skills could be valued.

In all cases, except for the Accelerator Area's employees of Case B2, the HRM view did not distinct any need for differentiated practices for strategic innovation employees that align the innovation strategy and the HRM systems, usually adopting an exclusive approach, as noted by scholars (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022). In Case B2, the HRM was demanded to develop new practices for specific strategic innovation employees, applying an inclusive approach for these individuals.

Thus, despite the literature asserts for specialized talent management and development aimed at individuals who work with strategic innovation management (Aagaard, 2017; Kelley et al., 2011; Marvel et al., 2007), few talent management initiatives were observed in most of the cases, for two of them there was only the possibility to obtain one development practice, a specialist career, and in the case where talent management practices were being developed, and they were only aimed at specific positions and dependent on the area in which they were allocated. The involvement in job design and decision-making (Katou & Budhwar, 2010; Oltra et al., 2022) was observed in all cases, but in some cases to a lesser extent than others. A

lack of recognition of the strategic innovation employees' contribution to innovation or a misalignment between the perceived contribution to the company and the size of the reward was noted in all cases, especially concerning a contrast between the performed roles and titled positions and the need be able to pay for developmental practices demanded by the organization, which can negatively affect strategic innovation employees' retention (Hebda et al., 2012). Ultimately, it was largely confirmed that HRM who work with strategic innovation employees do not distinguish the need for alignment of innovation strategy with HR systems, usually adopting a universalist approach (Hebda et al., 2012; Marx et al., 2016; Oltra et al., 2022), apart from the cases that they are directly demanded to design it for specific roles and positions that do not yet exist in the company.

Hence, the research findings pertaining to talent management for strategic innovation employees within established organizations resulted in the formulation of Proposition 5:

P5: *Established innovative companies rarely provide specialized talent management focused on strategic innovation employees. Strategic innovation employees frequently participate in job design and decision-making forums. Strategic innovation employees' contribution to innovation is recurrently unrecognized by established innovative companies, or there is a misalignment between the perceived impact and reward size, which can impact the retention of these employees. Established innovative companies need to acknowledge and demand the design of specific practices and systems for the human resource management area to avoid the adoption of a universalist approach for employees that work with strategic innovation that can hinder its development.*

Evaluation

The literature's assumptions regarding evaluation systems delve into the use of assessment results (Katou & Budhwar, 2010; O'Connor et al., 2018), how subjective and objective evaluation should be used for strategic innovation employees (Foss & Klein, 2014; Fowinkel, 2014; Kelley et al., 2011; Linder et al., 2015; Marx et al., 2016; O'Connor et al., 2018; Oltra et al., 2022), and its effectiveness in addressing

uncertainties compared to financial rewards (Kelley et al., 2011). The appraisal system characteristics of the studied cases are shown in Table 22.

Table 22: Data analysis related to the evaluation of strategic innovation employees.

Case	Use of assessment results	Subjective evaluation	Objective evaluation
A1	Profit sharing distribution, performance rewards, and career development.	180º, based on corporate competencies.	Individual, related to their work, cascaded from the immediate superior with employee's participation in goals' definition and adjustable metrics.
A2	Profit sharing distribution, performance rewards, and career development.	180º, based on corporate competencies.	Collective, unrelated to Strategic Innovation Unit's work, defined by the TMT for all innovation-related areas.
B1	Profit sharing distribution and individual competence development. And performance rewards for executive positions.	360º behavior analysis, based on the individual's strengths and improvement needs.	Collective, related to their work, cascaded from the immediate superior with teams' participation in goals' definition and adjustable metrics. Executives are assessed only objectively.
B2	Profit sharing distribution and individual competence development. And performance rewards for executive positions.	360º behavior analysis, based on the individual's strengths and improvement needs. Startup's managerial positions are assessed based on innovation competencies.	80% individual, related to their work cascaded from the immediate superior with employee's participation in goals' definition and adjustable metrics. 20% collective, may not be related to their work, related to the achievement of the strategic innovation VP's main goal. Executives are assessed only objectively.

Source: designed by the author.

Performance evaluation was confirmed to be a dominant HRM policy in the companies studied, as it was emphasized over other HR systems in all the cases. Its results are used in profit sharing distribution in all cases, career development and performance rewards in Cases A1 and A2, as well as individual competence development and performance rewards for executive positions in Cases B1 and B2, which is in accordance with the literature's assumptions of its use in decisions concerning salary, promotion, training, and financial rewards (Katou & Budhwar, 2010; O'Connor et al., 2018).

Strategic innovation employees are assessed subjectively in all cases, as indicated by the literature (Foss & Klein, 2014; Linder et al., 2015; Marx et al., 2016). However, just for managerial positions of the Acceleration Area startups of Case B2, the subjective evaluation focus on their innovation competencies, such as creativity to overcome problems (Oltra et al., 2022), entrepreneurial ability, broader-level motivation to innovate, risk-taking capacity (Kelley et al., 2011), while in Cases A1 and A2 it was grounded on leadership competencies, as team management skills, sustainable results delivery, systemic business view. In Cases B1 and B2, except for the Accelerator Area, the subjective appraisal was a behavior analysis based on the individual's strengths and improvement needs.

In Cases A1 and A2, the strategic innovation employees were evaluated by themselves, their superiors, and their peers. While in Cases B1 and B2, the evaluators were chosen by the employees and their superiors among those with whom they had more contact in the last year, regardless of the evaluator's hierarchical level. The participation of the chief of the employee's direct superior in performance appraisal may indicate a direct involvement and support of the TMT members, as advocated by scholars (Bruneel et al., 2012; Garms & Engelen, 2019; Kelley et al., 2011; Lazzarotti & Manzini, 2018; Marx et al., 2016), and the visibility given by their contact with individuals in higher positions of the organization, which may promote their career development (Fowinkel, 2014; Kelley et al., 2011).

Objective assessments for strategic innovation employees focus on what is under the individual's control (Linder et al., 2015; O'Connor et al., 2018), with the employee's participation in its definition (Aagaard, 2017; Fowinkel, 2014), in Cases A1, B1, and B2. In all cases, executives were evaluated only objectively. In Cases B1 and B2, the executives' goals were cascaded from the CEO or respective Strategic Innovation Unit's TMT member, with the participation of the executive and the leader on its definition, which indicates that goals were defined according to the innovation activities that were under their domain. Conversely, in Case A2, the goals were defined by the TMT for all areas related to innovation and unrelated to Strategic Innovation Unit's work, and in Case B2, part of the goals were collective and dependent on the strategic innovation VP's goal achievement, which might not be related to strategic innovation employees' work.

Cases A1, B1, and B2 presented the possibility of adjusting indicators linked to innovation activities, as argued by the literature (Marx et al., 2016; O'Connor et al., 2018). The prerogative of modulating evaluation goals might solve individual and project uncertainties, whether in cases of project discontinuation or due to other uncertainties that impact the result of evaluations, reducing the perception of career risk and job insecurity. In the cases presented, this realignment of goals occurs mainly in monthly team meetings, in Case B1, and through individual feedback that occurs with great frequency in all cases. Thus, it is possible to state that an extensive use of regular feedback meetings, which is part of the evaluation process in all cases, can help to mitigate uncertainties through the flexibility to modify the evaluation goals agreed upon at the beginning of the process, as asserted by Kelley et al. (2011).

Between cases with collective goals, only in Case B1 were the metrics aligned between the areas participating in the projects, as suggested by Marx et al. (2016). In Cases A2 and B2, the collective goals were not necessarily related to the work performed by the target holders. In Case B2, the collective goal impacted only 20% of the strategic innovation employee's score. However, in Case A2, it corresponded to their entire objective assessment, that is, the non-achievement of the goal, which was dependent on other unit's work, could have a high impact on the evaluation results of the entire Strategic Innovation Unit, whether on receiving financial rewards or career development aspects.

In none of the cases, it was observed an assessment that was exclusively subjective for earlier stages of strategic innovation development shifting to quantitative indicators as the projects moved to more advanced stages of development, as it was indicated by Fowinkel (2014).

Thus, the following aspects were observed in the analyzed cases: assessment is the main HRM system, prioritized over other HR systems in all cases, and its results were used in decisions over rewards, career development, and competence development, which is in line with the literature (Katou & Budhwar, 2010; O'Connor et al., 2018). Strategic innovation employees were assessed subjectively (Foss & Klein, 2014; Linder et al., 2015; Marx et al., 2016), except for those in executive positions, in all cases. The subjective evaluation focused on the strategic innovation employees' innovative competencies, as suggested by the literature (Kelley et al., 2011; Oltra et al., 2022), only in part of one case. In the other cases, the subjective appraisal was

based on leadership competencies or behavior analysis. Additionally, all strategic innovation employees, including executive positions, were assessed objectively.

In most cases, the performance evaluation focuses on what is under the individual's control (Linder et al., 2015; O'Connor et al., 2018), with adjustable indicators linked to innovation activities. Between the cases in which there were collective goals, in only one case, the metrics were aligned between the areas participating in the project (Marx et al., 2016). It was perceived in the cases that presented the possibility of renegotiating goals of the objective evaluation due to emerging uncertainties through the continuous feedback between team parties that evaluation practices might be effective in solving uncertainties (Kelley et al., 2011) when its targets were related to the employees' strategic innovation activities. However, it was not possible to state that this practice is more effective than the use of rewards, as the use of financial rewards was insignificant in the analyzed cases.

Therefore, the research findings regarding the evaluation system for strategic innovation employees in established innovative organizations led to the formulation of Proposition 6:

P6: *Evaluation is a primary HRM system, and its outcomes are crucial in rewards, career advancement, and competence development decisions. Strategic innovation employees are objectively assessed, frequently focused on adaptable indicators of their strategic innovation work activities. Non-executive strategic innovation employees are assessed subjectively, mainly based on work behavior analysis, leadership competencies, and hardly ever on their innovative competencies. Evaluation practices can mitigate strategic innovation project uncertainties when their targets are linked to strategic innovation activities and can be renegotiated in response to emerging uncertainties through continuous feedback between team members.*

Rewards

The literature's postulations concerning rewards systems explore the use of intrinsic and extrinsic rewards to motivate strategic innovation employees in distinct positions (Shaikh & O'Connor, 2020), the impact of rewards on strategic innovation (Andreeva et al., 2017; Beugelsdijk, 2008; Hebda et al., 2012; Leifer et al., 2000; Marvel et al., 2007; O'Connor et al., 2018; O'Connor & McDermott, 2004; Zhang & Jin,

2014), the importance of customizing recognition and rewards for strategic innovation project leaders (Hebda et al., 2012; Kelley et al., 2011), the consequences of poor implementation of the reward system on strategic innovation (Hebda et al., 2012), the effects of the concurrent use of evaluation and rewards (Aagaard & Andersen, 2014; Andreeva et al., 2017; O'Connor et al., 2018), and the potential promotion of collaboration of the balance between individual and group-based recognition and rewards (Andreeva et al., 2017). The data relating to the use of rewards and development practices, which will be discussed afterward, to motivate strategic innovation employees are presented in Table 23.

Table 23: Data analysis related to rewards and development for strategic innovation employees.

Case	Extrinsic rewards	Intrinsic rewards	Development incentives
A1	Profit sharing Performance bonus for managerial positions Executive bonus for executive leadership positions	Attending events and conferences Courses Training Adapted and customized by the leader	Visibility Possibility of development through an innovation program
A2	Profit sharing Performance bonus for managerial positions Executive bonus for executive leadership positions	Attending events and conferences Courses Training Adapted and customized by the leader	Visibility Specialist career for strategic innovation employees Possibility of development through an innovation program for all employees
B1	Profit sharing Executive bonus for executive leadership positions	Attending conferences Work time for courses and training Recognition for knowledge sharing Job security Adapted and customized by the leader	Visibility Specialist career for strategic innovation employees Possibility of development through an innovation program for all employees
B2	Profit sharing Executive bonus for executive leadership positions Accelerator Area: Performance-based pay linked to salary	Attending events Empowerment Job security Adapted and customized by the leader Accelerator Area: Autonomy Flexibility in working hours Asynchronous work Job security Adapted and customized by the leader	Visibility Specialist career for strategic innovation employees Executive career for strategic innovation employees Accelerator Area employees: Intra-entrepreneurship opportunities

Source: designed by the author.

In all cases, rewards were used aiming to motivate employees, as stated by Andreeva et al. (2017). However, it was confirmed that innovative companies tend to use intrinsic rewards with strategic innovation employees, providing extrinsic rewards exclusively for executive positions (Shaikh & O'Connor, 2020). Although profit sharing was a trivial reward distributed to all employees in all cases, as well as executive bonuses to executive leadership positions, performance bonuses aimed at managerial positions who achieved the highest score in the evaluation, in Cases A1 and A2, it was limited to one manager of the Strategic Innovation Unit per year, and, for one of the startups of the Accelerator Area's positions, half of the salary was variable. That is, except for the executive bonus, the amounts of which were confidential, the other financial rewards were incremental payments. While intrinsic rewards can be granted by managers in accordance with each employee's training and event-attendance needs in all cases.

In all cases, managers and directors could grant adapted and customized incentives to their subordinates, as suggested by the literature (Hebda et al., 2012; Kelley et al., 2011). In Cases A1 and A2, intrinsic rewards could be granted to the strategic innovation team through the budget of the area, in Cases B1 by the training and development initiatives of the individual development plan, and in Case B2 through the provision of opportunities to work in the startups of the Accelerator Area or to develop a strategic innovation project submitted to the ideation program developed by the Strategic Innovation Unit throughout the organization.

None of the cases presented extrinsic rewards developed specifically for the high uncertainty context of strategic innovation (O'Connor et al., 2018), once in the Startup B1 of Case B2 aimed to replicate general startup practices. Neither was the use of phantom stocks identified as a reward for strategic innovation employees, as warned by O'Connor et al. (2018), nor resentment caused by an inadequate reward system in any of the cases, as prevented by Hebda et al. (2012).

The nature of this research project and the scarcity of financial rewards in the cases make it not possible to determine its impact on the development of strategic innovation, as it is diverged in the literature (Andreeva et al., 2017; Beugelsdijk, 2008; Hebda et al., 2012; Leifer et al., 2000; Marvel et al., 2007; O'Connor et al., 2018; O'Connor & McDermott, 2004). In addition to estimate if the mutual use of rewards and

evaluation practices, when assessment is more emphasized than the incentives, may inhibit strategic innovation (Andreeva et al., 2017).

All cases presented individual incentives that encourage intellectual experimentation, as recommended by Zhang & Jin (2014), but only in Case B2 were they directed at strategic innovation employees; the other cases were aimed at all employees of the organization that desired to participate in internal innovation programs voluntarily.

In the only case in which collective evaluation and extrinsic rewards were used concurrently, it cannot be stated that the practice was in accordance with the literature's statement that the mutual use of the team-based appraisal and performance pay may stimulate employee innovative behavior (Aagaard & Andersen, 2014; O'Connor et al., 2018), as the collective assessment was completely unrelated to the work of the strategic innovation team, thus not being able to be called team-based evaluation.

No incentives were identified that rewarded long-term success aiming to lead to higher levels of strategic innovation (Zhang & Jin, 2014), group-based achievements recognition, that balanced with individual incentives, could incentivize collaboration and inhibit competitiveness (Farouk et al., 2016; Hebda et al., 2012; Kelley et al., 2011; Marx et al., 2016).

Although the literature emphasizes the use of extrinsic rewards, often combined with intrinsic ones, it was observed that the latter is not extensively addressed by the HRM aimed at strategic innovation management literature. It was observed that even non-financial rewards are underused in the analyzed cases. In Cases A1, A2, and B1, intrinsic rewards were extensively related to participation in conferences and innovation events, incentive to attend post-graduation programs and knowledge development and management classes, and, often, foreseeing that the employee affords these required courses.

Whereas Case B2 presented a broader perspective on the use of intrinsic rewards, which are aligned with HRM's literature statements that people's preferences encompass factors such as engaging work that offers chances for personal development, a supportive and equitable workplace environment, and opportunities for social connections (Thunnissen et al., 2013), that is, beyond the economic benefits,

considering individual and societal wellbeing. In Case B2, besides innovation events attendance and continuous knowledge acquisition, the provision of employee empowerment and visibility of managers and analysts with members of the organization's TMT was identified. In contrast, strategic innovation employees from the Accelerator Area were conferred autonomy, flexibility in working hours, asynchronous work, and could receive intra-entrepreneurship opportunities in an Innovation Executive position.

The misconnection between the intrinsic rewards offered and an individual's motivators may be due to innovation managers' sole responsibility of providing these rewards, as affirmed by scholars (Hebda et al., 2012; Kelley et al., 2011), without adequate support from HRM, which has the expertise to align desired work behaviors with the individual's motivation. While managers' abilities and concerns focus on linking the strategic innovation project's requirements and their team's necessary skills and knowledge development.

Therefore, it was possible to identify that reward practices were used to motivate strategic innovation employees (Andreeva et al., 2017). However, innovative companies tend to use intrinsic rewards with strategic innovation employees, providing extrinsic rewards almost exclusively for executive positions (Shaikh & O'Connor, 2020). Strategic innovation managers could formally adapt and customize recognition and rewards, not only to project leaders, as stated by the literature (Hebda et al., 2012; Kelley et al., 2011), but to strategic innovation employees in general, in all cases. Performance-related financial incentives objectives were not developed specifically for the high uncertainty context of strategic innovation, as it would be indicated by O'Connor et al. (2018). In one case, it was only possible to observe individual incentives for strategic innovation employees who encourage intellectual experimentation (Zhang & Jin, 2014). In the other cases, it was cultivated for all the companies' employees.

Consequently, the research findings concerning the rewards system for strategic innovation employees within established innovative companies allowed the development of Proposition 7:

P7: *Rewards practices are employed in innovative established companies to incentivize strategic innovation employees, being intrinsic rewards primarily directed towards non-executive employees, while extrinsic rewards are predominantly reserved for executive positions in general. Strategic innovation managers may formally adapt and customize recognition and rewards to strategic innovation employees. Established innovative companies usually provide individual incentives for all employees that encourage intellectual experimentation and may lead in engagement to strategic innovation development.*

Development

The literature's assumptions regarding development practices examine directions to promote career development for strategic innovation employees in established innovative companies within the strategic innovation function (Fowinkel, 2014; Kelley et al., 2011; O'Connor et al., 2018) and the possibility of career development through the simultaneous use of rewards and recognition practices (Kelley et al., 2011). The data related to the development practices to motivate strategic innovation employees are presented in Table 23.

The career development promotion of strategic innovation employees' visibility was allowed by their frequent contact with the TMT (Fowinkel, 2014; Kelley et al., 2011; O'Connor et al., 2018) in Cases A1, A2, and B1 for their participation in innovation committees, and in Case B2, in which, in addition to participating in and leading several innovation committees, had a transversal role with different areas of the company.

Cases A2, B1, and B2 provided the possibility of specialist career development for strategic innovation employees. In Case A1, it was a frequent demand from the Strategic Innovation Unit to the HRM. Only Case B2 also conferred the opportunity of an executive strategic innovation career path, as recommended by O'Connor et al. (2018).

Case B1 was the sole representative of the use of innovation talent pools for strategic innovation employees, as suggested by O'Connor et al. (2018), which provides job security and prevents a sense of career risk caused by project uncertainties and the simultaneous use of intrinsic rewards together with recognition

practices, as recommended by Kelley et al. (2011), although it was not identified that these practices led to career development in the case analyzed.

Hence, concerning developmental practices, it was noticed that strategic innovation employees' visibility was promoted by their frequent contact with the TMT (Fowinkel, 2014; Kelley et al., 2011; O'Connor et al., 2018) in all cases, which could lead to career development. Most cases provided career paths for strategic innovation specialists, and one case for strategic innovation executives (O'Connor et al., 2018). One of the cases used innovation talent pools and the simultaneous use of intrinsic rewards along with recognition practices (Kelley et al., 2011), but it was not possible to observe that these practices led to career development.

The research findings concerning the development practices for strategic innovation employees within established innovative companies led to the formulation of Proposition 8.

P8: *The visibility of strategic innovation employees is commonly promoted by their frequent contact with the top-management team in established innovative companies, which may lead to career development. Established innovative companies frequently provide the possibility of a strategic innovation specialist career, occasionally offer the strategic innovation executive career, and sporadically use innovation talent pools for strategic innovation employees.*

Thus, concerning HRM practices, it was evidenced that greater attention is needed to manage and retain strategic innovation talent in the analyzed cases, which promotes the recognition of these employees' contributions and their involvement in decisions and job design. Among the analyzed HRM practices, unlike what was addressed by the literature, which emphasized the need to use financial rewards for strategic innovation employees, evaluation and development were prioritized and showed benefits in its use for this part of the workforce. It was observed especially in the use of feedback and the realignment of objective evaluation metrics, the strategic innovation employees' proactivity to overcome HRM practices' details that could cause issues to strategic innovation development, the use of attractive intrinsic rewards and job security, the visibility of strategic innovation employees' among the TMT, the provision of challenging career opportunities and interesting competence development and strategic innovation specialist and executive career paths.

8. CONCLUSION

The research thesis sought to answer the following questions “Which aspects of the human resources system are most related to the strategic innovation development in established innovative companies? And how these human resource aspects are used to overcome strategic innovation challenges, in the attempt of enhancing innovation outcomes?” aiming to contribute to a further comprehension of the human aspects that impact the development of strategic innovation in established companies.

Due to the intersection between strategic innovation management and HRM is a subject still under-addressed in the literature, this research was guided by the methodology-building theory from case studies (Eisenhardt, 1989), which allowed an embedded design, combining qualitative and quantitative data and an iterative research process and the juxtaposition of the evidence across cases, data, and literature that enable the convergence of a consistent new theoretical vision to contribute to theory building.

The extended literature review using the constructs that emerged from the primary literature allowed the creation of a comprehensive framework on the interrelations between strategic innovation management and HRM, presented in Figure 3 and Table 3, and an immersive conceptual view of these subjects. The analysis of the CEOs showed that, even among the most innovative companies in Brazil and the world, the executive career of professionals linked to innovation in general hardly reaches the highest position in the hierarchical structure of companies, despite evidence of the positive impacts that this can bring to the development of strategic innovation. Furthermore, the longitudinal analysis showed that the percentage of CEOs experienced in innovation is volatile to contextual changes in the market and politics. Moreover, the investigation on talent management for innovation confirmed the use of assessment and rewards practices from the literature and highlighted the importance of development practices for talent management and retention.

Organizations have difficulty hiring and retaining strategic innovation employees, as verified in the analyzed cases and the view of HR experts. Uncertainty directly impacts the performance of people who work with strategic innovation. While uncertainties related to the development of strategic innovation projects can affect the

results of individual evaluation, the lack of vision for development opportunities within the company, the occurrence of external hires instead of promoting one of the in-house managers in the area, frequent organizational changes, and individual needs for career progression, recognition, or salary increases, for example, can be met by the approach of competing companies offering employment or by an opportunity to become an entrepreneur. A lack of incentives and a greater perception of career risk were observed among non-executive positions. This may indicate that career insecurity decreases as the individual incorporates a baggage of knowledge, network, and reputation in the company and the market.

Both strategic innovation management and HRM must be aligned with the company's strategy. Therefore, an HRM system that considers and prioritizes the innovation strategy can significantly impact the management and retention of strategic innovation talents. Therefore, rather than being a request from strategic innovation employees, the TMT needs to acknowledge the importance of retaining strategic innovation talents and align the innovation strategy to the HRM assignments, establishing retention indicators for its human capital with innovative capacity and developing a talent management system for strategic innovation employees. The close involvement of TMT with the strategic innovation portfolio and projects may indicate a lack of perception of the needs of cascading strategic objectives related to innovations with greater uncertainty for the HRM area.

Among the HRM practices, objective evaluation using criteria related to the individual or team's work that can be renegotiated in case of emerging projects' uncertainties through the extensive use of feedback to align adversities, a collective evaluation that encourages team cooperation, subjective evaluation with criteria based on innovation-related competencies, and the provision of job security as well as career opportunities as a strategic innovation specialist, strategic innovation executive, and intra-entrepreneurship in strategic innovation seems to have the potential to reduce career uncertainties and impact the retention of innovation talents.

Finally, all these aspects reinforce the need for individuals experienced in strategic innovation in the TMT positions of innovative established companies as they are responsible for the creation of the organization's strategy, legitimation of the strategic innovation in the organization through its innovation strategy, structure, processes, roles and positions and direct involvement on its development, and

demanding from the HRM the creation proper HRM practices and opportunities for individuals who work with strategic innovation to develop their careers within the strategic innovation function.

This research thesis contributes to the innovation management literature by the creation of propositions to guide further investigation and provide a basis for theoretical development on strategic innovation development and human resource management, the formulation of a framework that encompasses aspects related to managing people in strategic innovation management, the confirmation of the talent management practices most closely related to innovation management, highlighting the importance of the role of TMT in maintaining and legitimizing the strategic innovation function, as well as managing and retaining strategic innovation employees, and demonstrating that HRM practices can help to reduce uncertainties related to strategic innovation projects and the turnover of strategic innovation employees, specially objective evaluation practices with renegotiable indicators, frequent communication and feedback, and the provision of interesting career development opportunities and job security.

The managerial contribution of the thesis relates to elucidating the aspects related to HRM that impact strategic innovation management, highlighting the importance of experienced individuals in innovation and diverse functions to act in the roles of CEO and CIO among the TMT of the organization for maintaining and legitimizing the strategic innovation function, emphasizing the need to reduce turnover and manage and retain strategic innovation employees in the company, and demonstrating how HRM practices can help reduce uncertainties related to strategic innovation projects and turnover of strategic innovation employees.

This research project has several limitations, including the low occurrence of companies that develop strategic innovation internally in Brazil, as many companies rely on research centers and startups for innovation instead of internalizing responsibility for the human capital involved. Additionally, accessing companies and identifying individuals who work with strategic innovations within them proved to be challenging, as executives and HR personnel resisted participating in the research project. Furthermore, obtaining specific information about HRM systems and the financial rewards of executive positions was also exceedingly difficult. Due to these obstacles, the research was limited in conducting fewer case studies within the

available time. Lastly, the use of secondary data may lead to biases, although this limitation can be addressed in future research.

This thesis unfolds avenues for future research, such as delving deeper into the impact of using development, evaluation metrics realignment, and intensive feedback for managing people who work with strategic innovation, exploring the power of managers and executives' reputation and networking on strategic innovation development, the effect of incorporating different roles and positions to a single strategic innovation employee, particularly if they have conflicting interests, such as incremental and strategic innovation, and investigating how HRM impacts strategic innovation management in different contexts, such as startups, research centers, and universities.

BIBLIOGRAFY

Aagaard, A. (2017). Facilitating Radical Front-End Innovation Through Targeted HRM Practices: A Case Study of Pharmaceutical and Biotech Companies. *Journal of Product Innovation Management*, *34*(4), 427–449. https://doi.org/10.1111/jpim.12387

Aagaard, A., & Andersen, T. (2014). How can HR practices support front end innovation and increase firm innovativeness ? *International Journal of Applied Engineering Research*, *8*(5), 488–505.

Alamayreh, E. M., Sweis, R. J., & Obeidat, B. Y. (2019). The relationship among innovation, organisational ambidexterity and organisational performance. *International Journal of Business Innovation and Research*, *19*(4), 554–579. https://doi.org/10.1504/IJBIR.2019.101656

Andreeva, T., Vanhala, M., Sergeeva, A., Ritala, P., & Kianto, A. (2017). When the fit between HR practices backfires: Exploring the interaction effects between rewards for and appraisal of knowledge behaviours on innovation. *Human Resource Management Journal*, *27*(2), 209–227. https://doi.org/10.1111/1748-8583.12133

Arbix, G., Salerno, M. S., Amaral, G., & Lins, L. M. (2017). Avanços, Equívocos e Instabilidade das Políticas de Inovação no Brasil. *Novos Estudos CEBRAP*, *36*(3), 9–27. https://doi.org/10.25091/S0101-3300201700030002

Backes-Gellner, U., Kluike, M., Pull, K., Schneider, M. R., & Teuber, S. (2016). Human resource management and radical innovation: a fuzzy-set QCA of US multinationals in Germany, Switzerland, and the UK. *Journal of Business Economics*, *86*(7), 751–772. https://doi.org/10.1007/s11573-015-0803-3

Bagno, R. B., Salerno, M. S., & Dias, A. V. C. (2017). Innovation as a new organizational function: Evidence and characterization from large industrial companies in Brazil. *Production*, *27*, 1–13. https://doi.org/10.1590/0103-6513.207316

Bansal, P. T., Smith, W. K., & Vaara, E. (2018). New ways of seeing through qualitative research. *Academy of Management Journal*, *61*(4), 1189–1195. https://doi.org/10.5465/amj.2018.4004

BCG. (2020). *The most innovative companies over time*. https://www.bcg.com/pt-br/publications/most-innovative-companies-historical-rankings

Beechler, S., & Woodward, I. C. (2009). The global “war for talent.” *Journal of International Management*, *15*(3), 273–285. https://doi.org/10.1016/j.intman.2009.01.002

Beugelsdijk, S. (2008). Strategic Human Resource Practices and Product Innovation. *Organization Studies*, *29*(6), 821–847. https://doi.org/10.1177/0170840608090530

Björkman, I., Ehrnrooth, M., Mäkelä, K., Smale, A., & Sumelius, J. (2013). Talent or Not? Employee Reactions to Talent Identification. *Human Resource Management*, *52*(2), 195–214. https://doi.org/10.1002/hrm.21525

Boxall, P., & Purcell, J. (2011). Strategic human resource management. In *Strategic Human Resource Management* (3rd ed.). Palgrave Macmillan.

Brasil, V. C., Salerno, M. S., & Gomes, L. A. de V. (2018). Valuation of innovation projects with high uncertainty: Reasons behind the search for real options. *Journal of Engineering and Technology Management - JET-M*, *49*(March), 109–122. https://doi.org/10.1016/j.jengtecman.2018.08.001

Bruneel, J., van de Veldea, E., Clarysse, B., & Gemmel, P. (2012). Improving the success of radical innovation projects within established firms: Engaging employees across different hierarchal levels. *Technology Analysis and Strategic Management*, *24*(9), 951–965. https://doi.org/10.1080/09537325.2012.718667

Burnes, B. (1997). Organizational choice and organizational change. *Management Decision*, *35*(10), 753–759. https://doi.org/10.1108/00251749710192075

Caridi-Zahavi, O., Carmeli, A., & Arazy, O. (2016). The Influence of CEOs’ Visionary Innovation Leadership on the Performance of High-Technology Ventures: The Mediating Roles of Connectivity and Knowledge Integration. *Journal of Product Innovation Management*, *33*(3), 356–376. https://doi.org/10.1111/jpim.12275

Carvalho, M. M., Fleury, A., & Lopes, A. P. (2013). An overview of the literature on technology roadmapping (TRM): Contributions and trends. *Technological Forecasting and Social Change*, *80*(7), 1418–1437. https://doi.org/10.1016/j.techfore.2012.11.008

Cavagnoli, D. (2011). A conceptual framework for innovation: An application to human resource management policies in Australia. *Innovation: Management, Policy and Practice*, *13*(1), 111–125. https://doi.org/10.5172/impp.2011.13.1.111

Chandrasekaran, A., Linderman, K., & Schroeder, R. (2015). The role of project and organizational context in managing high-tech R&D projects. *Production and Operations Management*, *24*(4), 560–586. https://doi.org/10.1111/poms.12253

Chao, R. O., & Kavadias, S. (2008). A Theoretical Framework for Managing the New Product Development Portfolio: When and How to Use Strategic Buckets. *Management Science*, *54*(5), 907–921. https://doi.org/10.1287/mnsc.1070.0828

Cho, S. Y., & Kim, S. K. (2017). Horizon problem and firm innovation: The influence of CEO career horizon, exploitation and exploration on breakthrough innovations. *Research Policy*, *46*(10), 1801–1809. https://doi.org/10.1016/j.respol.2017.08.007

Choi, B., Ravichandran, T., & O'Connor, G. C. (2018). Organizational Conservatism, Strategic Human Resource Management, and Breakthrough Innovation. *IEEE Transactions on Engineering Management*, *PP*, 1–13. https://doi.org/10.1109/TEM.2018.2845343

Christensen, C. M., & Raynor, M. E. (2003). *The Innovator's Solution* (Harvard Business Review Pres, Ed.).

Chung, D., & Kang, M. (2019). Characteristics of Chief Technology Officers and Radical Innovation. *International Journal of Innovation and Technology Management*, *16*(3), 1–18. https://doi.org/10.1142/S0219877019500263

Cooper, R. G. (2014). Where Are All the Breakthrough New Products?: Using Portfolio Management to Boost Innovation. *Research-Technology Management*, *56*(5), 25–33. https://doi.org/10.5437/08956308x5605123

Cortes, A. F., & Herrmann, P. (2021). Strategic Leadership of Innovation: A Framework for Future Research. *International Journal of Management Reviews*, *23*(2), 224–243. https://doi.org/10.1111/ijmr.12246

Cummings, T., & Knott, A. M. (2018). Outside CEOs and innovation. *Strategic Management Journal*, *39*(8), 2095–2119. https://doi.org/10.1002/smj.2792

da Silva, D. O., Bagno, R. B., & Salerno, M. S. (2014). Models for innovation management: Review and analysis of the literature. *Production*, *24*(2), 477–490. https://doi.org/10.1590/S0103-65132013005000059

Daellenbach, U. S., McCarthy, A. M., & Schoenecker, T. S. (1999). Commitment to innovation: The impact of top management team characteristics. *R and D Management*, *29*(3), 199–208. https://doi.org/10.1111/1467-9310.00130

Davies, B., & Davies, B. J. (2010). Talent management in academies. *International Journal of Educational Management*, *24*(5), 418–426. https://doi.org/10.1108/09513541011055983

de Visser, M., & Faems, D. (2015). Exploration and Exploitation within Firms: The Impact of CEOs' Cognitive Style on Incremental and Radical Innovation Performance. *Creativity and Innovation Management*, *24*(3), 359–372. https://doi.org/10.1111/caim.12137

de Vos, A., & Dries, N. (2013). Applying a talent management lens to career management: the role of human capital composition and continuity. *The International Journal OfHuman Resource Management*, *24*(9), 1816–1831.

Donizetti, G., & Fischer, A. L. (2018). *Relevant Human Resource Management Journals: the manual*.

Dyer, J., & Gregersen, H. (2016, August 24). *How We Rank The Most Innovative Companies 2016*. https://www.forbes.com/sites/innovatorsdna/2016/08/24/how-we-rank-the-most-innovative-companies-2016/?sh=1cca76265506

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, *14*(4), 532–550.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*(1), 25–32. https://doi.org/10.5465/AMJ.2007.24160888

Farouk, S., Elanain, H. M. A., Obeidat, S. M., & Al-Nahyan, M. (2016). HRM practices and organizational performance in the UAE banking sector. *International Journal of Productivity and Performance Management*, *65*(6), 773–791. https://doi.org/10.1108/IJPPM-01-2016-0010

Forbes. (2018). *The world's most innovative companies*. https://doi.org/10.67%

Formica, S., & Sfodera, F. (2022). The Great Resignation and Quiet Quitting paradigm shifts: An overview of current situation and future research directions. *Journal of Hospitality Marketing & Management*, *31*(8), 899–907. https://doi.org/10.1080/19368623.2022.2136601

Foss, N. J., & Klein, P. G. (2014). Why Managers Still Matter? *MIT Sloan Management Review*, *56*(1), 73–80. http://search.proquest.com/docview/1627693752?accountid=29104%5Cnhttp://sfx.obvsg.at:3210/sfxwuw?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Aabiglobal&atitle=Why+Managers+Still+Matter&title=MIT+Sloan+Manageme

Fowinkel, T. (2014). *Human resource management systems in new business creation: an exploratory study*. Springer Gabler.

Fraser, M. T. D., & Gondim, S. M. G. (2004). Da Fala do Outro ao Texto Negociado: discussões sobre a entrevista na pesquisa qualitativa. *Paidéia*, *14*(28), 139–152.

Gallardo-Gallardo, E., Dries, N., & González-Cruz, T. F. (2013). What is the meaning of “talent” in the world of work? *Human Resource Management Review*, *23*(4), 290–300. https://doi.org/10.1016/j.hrmr.2013.05.002

Garms, F. P., & Engelen, A. (2019). Innovation and R&D in the Upper Echelons: The Association between the CTO’s Power Depth and Breadth and the TMT’s Commitment to Innovation. *Journal of Product Innovation Management*, *36*(1), 87–106. https://doi.org/10.1111/jpim.12441

Gehman, J., Glaser, V. L., Eisenhardt, K. M., Gioia, D., Langley, A., & Corley, K. G. (2018). Finding Theory–Method Fit: A Comparison of Three Qualitative Approaches to Theory Building. *Journal of Management Inquiry*, *27*(3), 284–300. https://doi.org/10.1177/1056492617706029

Gephart Jr, R. P. (2004). Qualitative Research and the Academy of Management Journal Editor’s. *Academy of Management Journal*, *47*(4), 454–462. https://doi.org/10.1017/s1743923x07070018

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods*, *16*(1), 15–31. https://doi.org/10.1177/1094428112452151

Gomes, L. A. de V., Brasil, V. C., de Paula, R. A. S. R., Facin, A. L. F., Gomes, F. C. de V., & Salerno, M. S. (2019). Proposing a Multilevel Approach for the Management of Uncertainties in Exploratory Projects. *Project Management Journal*, *50*(5), 554–570. https://doi.org/10.1177/8756972819870064

Gomes, L. A. de V., Salerno, M. S., Phaal, R., & Probert, D. R. (2018). How entrepreneurs manage collective uncertainties in innovation ecosystems. *Technological Forecasting and Social Change*, *128*(April 2016), 164–185. https://doi.org/10.1016/j.techfore.2017.11.016

Goodall, A. H., & Pogrebna, G. (2015). Expert leaders in a fast-moving environment. *The Leadership Quarterly*, *26*, 123–142. https://doi.org/10.1016/j.leaqua.2014.07.009

Guerra, J. H. L. (2010). Proposta de um Protocolo para o Estudo de Caso em Pesquisas Qualitativas. *XXX Encontro Nacional de Engenharia de Produção*.

Hausknecht, J. P., Rodda, J., & Howard, M. J. (2009). Targeted employee retention: Performance-based and job-related differences in reported reasons for staying. *Human Resource Management*, *48*(2), 269–288. https://doi.org/10.1002/hrm.20279

Hebda, J. M., Vojak, B. A., Griffin, A., & Price, R. L. (2012). Motivating and demotivating technical visionaries in large corporations: A comparison of perspectives. *R and D Management*, *42*(2), 101–119. https://doi.org/10.1111/j.1467-9310.2011.00669.x

Holahan, P. J., Sullivan, Z. Z., & Markham, S. K. (2014). Product development as core competence: How formal product development practices differ for radical, more innovative, and incremental product innovations. *Journal of Product Innovation Management*, *31*(2), 329–345. https://doi.org/10.1111/jpim.12098

Isabella, L. A. (1990). Evolving Interpretations as a Change Unfolds: How Managers Construe Key Organizational Events. *Academy of Management Journal*, *33*(1), 7–41. https://doi.org/10.5465/256350

Jonas, D. (2010). Empowering project portfolio managers: How management involvement impacts project portfolio management performance. *International*

Journal of Project Management, *28*(8), 818–831. https://doi.org/10.1016/j.ijproman.2010.07.002

Kanchanabha, B., & Badir, Y. F. (2021). Top management Team's cognitive diversity and the Firm's ambidextrous innovation capability: The mediating role of ambivalent interpretation. *Technology in Society*, *64*. https://doi.org/10.1016/j.techsoc.2020.101499

Katou, A. A., & Budhwar, P. S. (2010). Causal relationship between HRM policies and organisational performance: Evidence from the Greek manufacturing sector. *European Management Journal*, *28*(1), 25–39. https://doi.org/10.1016/j.emj.2009.06.001

Kelley, D. J., O'Connor, G. C., Neck, H., & Peters, L. (2011). Building an organizational capability for radical innovation: The direct managerial role. *Journal of Engineering and Technology Management - JET-M*, *28*(4), 249–267. https://doi.org/10.1016/j.jengtecman.2011.06.003

Keum, D. D. (2021). Innovation, short-termism, and the cost of strong corporate governance. *Strategic Management Journal*, *42*(1), 3–29. https://doi.org/10.1002/smj.3216

Killen, C. P., Hunt, R. A., & Kleinschmidt, E. J. (2008). Project portfolio management for product innovation. *International Journal of Quality and Reliability Management*, *25*(1), 24–38. https://doi.org/10.1108/02656710810843559

Klotz, A. C., & Bolino, M. C. (2022). When Quiet Quitting Is Worse Than the Real Thing. *Harvard Business Review*. https://hbr.org/2022/09/when-quiet-quitting-is-worse-than-the-real-thing

Knight, F. H. (1921). *Risk, Uncertainty and Profit* (Vol. 31). Houghton Mifflin.

Koberg, C. S., Uhlenbruck, N., & Sarason, Y. (1996). Facilitators of organizational innovation: the role of life-cycle stage. *Journal of Business Venturing*, *11*(2), 133–149.

Koch, M., Forgues, B., & Monties, V. (2017). The way to the top: career patterns of Fortune 100 CEOs. *Human Resource Management*, *56*(2), 267–285.

Kong, E., Chadee, D., & Raman, R. (2013). Managing Indian IT professionals for global competitiveness: The role of human resource practices in developing knowledge

and learning capabilities for innovation. *Knowledge Management Research and Practice*, *11*(4), 334–345. https://doi.org/10.1057/kmrp.2012.21

Kontoghiorghes, C. (2016). Linking high performance organizational culture and talent management: satisfaction/motivation and organizational commitment as mediators. *International Journal of Human Resource Management*, *27*(16), 1833–1853. https://doi.org/10.1080/09585192.2015.1075572

Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, *24*(4), 691–710. https://doi.org/10.5465/AMR.1999.2553248

Langley, A., & Meziani, N. (2020). Making Interviews Meaningful. *The Journal of Applied Behavioral Science*, 1–22. https://doi.org/10.1177/0021886320937818

Larkin, R. (2014). Alternative control methods for exploiting subsidiary knowledge within an MNE: quantity versus quality. *Journal of Knowledge Management*, *18*(6), 1184–1197. https://doi.org/10.1108/JKM-04-2014-0160

Lazzarotti, V., & Manzini, R. (2018). Balancing actions for radical and incremental innovations in SAES Getters. *International Journal of Business Innovation and Research*, *15*(4), 452–466.

Leifer, R., Mcdermott, C. M., O'connor, G. C., Peters, L. S., Rice, M. P., & Veryzer, R. W. (2000). *Radical Innovation: how mature companies can outsmart upstarts*. Harvard Business School Press.

Lettice, F., & Thomond, P. (2008). Allocating resources to disruptive innovation projects: challenging mental models and overcoming management resistance. *International Journal of Technology Management*, *44*, 140–159.

Linder, S., Lyngsie, J., Foss, N. J., & Zahra, S. A. (2015). Wise Choices: How Thoroughness of Opportunity Appraisal, Incentives, and Performance Evaluation Fit Together. *IEEE Transactions on Engineering Management*, *62*(4), 484–494. https://doi.org/10.1109/TEM.2015.2453334

Marvel, M. R., Griffin, A., Hebda, J., & Vojak, B. (2007). Examining the technical corporate entrepreneurs' motivation: Voices from the field. *Entrepreneurship: Theory and Practice*, *31*(5), 753–768. https://doi.org/10.1111/j.1540-6520.2007.00198.x

Marx, R., Soares, J. P. R. F., & Barros, L. S. da S. (2016). Organizational context variables to be considered in the reward system design oriented to product innovation. *Review of Business Management*, *18*(60), 267–289. https://doi.org/10.7819/rbgn.v18i60.2822

Melo, J. C. F. de, Salerno, M. S., Freitas, J. S., Bagno, R. B., & Brasil, V. C. (2020). From open innovation projects to open innovation project management capabilities: A process-based approach. *International Journal of Project Management*, *38*(5), 278–290. https://doi.org/10.1016/j.ijproman.2020.06.006

Microsoft. (2022). *Work Trend Index: Annual Report*. https://news.microsoft.com/wp-content/uploads/prod/sites/631/2022/03/WTI_AnnualReport_Extended_.pdf

Mom, T. J. M., van den Bosch, F. A. J., & Volberda, H. W. (2009). Understanding Variation in Managers' Ambidexterity: Investigating Direct and Interaction Effects of Formal Structural and Personal Coordination Mechanisms. *Organizational Science*, *20*(4), 812–828. https://doi.org/https://doi.org/10.1287/orsc.1090.0427

Naeiji, M. J., & Siadat, S. H. (2019). Developing a measurement for strategic entrepreneurship by linking its dimensions to competitiveness in knowledge-based firms. *International Journal of Business Innovation and Research*, *18*(1), 1–18. https://doi.org/10.1504/IJBIR.2019.096895

Nagji, B., & Tuff, G. (2012). Managing your innovation portfolio. *Harvard Business Review*, *90*(5).

O'Connor, G. C. (2012). Innovation: From Process to Function. *Journal of Product Innovation Management*, *29*(3), 361–363. https://doi.org/10.1111/j.1540-5885.2012.00909.x

O'Connor, G. C., Corbett, A. C., & Peters, L. S. (2018). *Beyond the champion: institutionalizing innovation through people* (1st ed.). Stanford Business Books. https://doi.org/10.1038/469026a

O'Connor, G. C., Leifer, R., Paulson, A. S., & Peters, L. S. (2008). *Grabbing lightning: building a capability for breakthrough innovation* (1st ed.). John Wiley & Sons.

O'Connor, G. C., & McDermott, C. M. (2004). The human side of radical innovation. *Journal of Engineering and Technology Management - JET-M*, *21*(1–2), 11–30. https://doi.org/10.1016/j.jengtecman.2003.12.002

Oltra, V., Donada, C., & Alegre, J. (2022). Facilitating radical innovation through secret technology-oriented skunkworks projects: Implications for human resource practices. *Human Resource Management Journal*, *32*(1), 133–150. https://doi.org/10.1111/1748-8583.12397

O'Reilly, C. A., & Tushman, M. L. (2004). The Ambidextrous Organization. *Harvard Business Review*, *82*(4), 74–83.

Ottenbacher, M. C., & Harrington, R. J. (2010). Strategies for achieving success for innovative versus incremental new services. *Journal of Services Marketing*, *24*(1), 3–15. https://doi.org/10.1108/08876041011017853

Pisano, G. P. (2015). You Need an Innovation Strategy. *Harvard Business Review*, *93*(6), 44–54. http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=102786227&site=eds-live

Prasad, B., & Junni, P. (2017). A contingency model of CEO characteristics and firm innovativeness. *Management Decision*, *55*(1), 156–177. https://doi.org/10.1108/md-02-2016-0071

Probst, G., Raisch, S., & Tushman, M. L. (2011). Ambidextrous leadership. Emerging challenges for business and HR leaders. *Organizational Dynamics*, *40*(4), 326–334. https://doi.org/10.1016/j.orgdyn.2011.07.010

Roberts, E. B., & Fusfeld, A. R. (1980). *Critical functions needed roles in the innovation process*. Massachusetts Institute of Technology.

Sadiq, F., Hussain, T., & Naseem, A. (2021). Managers' disruptive innovation activities: the construct, measurement and validity. *Management Decision*, *59*(2), 153–174. https://doi.org/10.1108/MD-08-2019-1047

Salerno, M. S. (2012). Inovação tecnológica e trajetória recente da política industrial. *Revista USP*, *0*(93), 45. https://doi.org/10.11606/issn.2316-9036.v0i93p45-58

Salerno, M. S., & Gomes, L. A. de V. (2018). *Gestão da inovação (mais) radical* (1st ed.). Elsevier Editora Ltda.

Salerno, M. S., Gomes, L. A. de V., da Silva, D. O., Bagno, R. B., & Freitas, S. L. T. U. (2015). Innovation processes: Which process for which project? *Technovation*, *35*(January), 59–70. https://doi.org/10.1016/j.technovation.2014.07.012

Sandberg, B., & Aarikka-Stenroos, L. (2014). What makes it so difficult? A systematic review on barriers to radical innovation. *Industrial Marketing Management*, *43*(8), 1293–1305. https://doi.org/10.1016/j.indmarman.2014.08.003

Seeck, H., & Diehl, M. R. (2017). A literature review on HRM and innovation–taking stock and future directions. *International Journal of Human Resource Management*, *28*(6), 913–944. https://doi.org/10.1080/09585192.2016.1143862

Shaikh, I. A., & O'Connor, G. C. (2020). Understanding the motivations of technology managers in radical innovation decisions in the mature R&D firm context: An Agency theory perspective. *Journal of Engineering and Technology Management - JET-M*, *55*(December 2019). https://doi.org/10.1016/j.jengtecman.2020.101553

Sitter, L. U. de, den Hertog, J. F., & Dankbaar, B. (1997). From Complex Organizations with Simple Jobs to Simple Organizations with Complex Jobs. *Human Relations*, *50*(5). https://doi.org/10.1023/A:1016987702271

Slater, S. F., Mohr, J. J., & Sengupta, S. (2014). Radical product innovation capability: Literature review, synthesis, and illustrative research propositions. *Journal of Product Innovation Management*, *31*(3), 552–566. https://doi.org/10.1111/jpim.12113

Storey, J., Wright, P. M., & Ulrich, D. (2019). Mapping the field of strategic human resource management. In *Strategic Human Resource Management: A Research Overview* (1st ed., pp. 1–32). Taylor & Francis Group. https://doi.org/10.4324/9780429490217

Strategy&. (2020). *Prêmio Valor Inovação Brasil 2020*. https://www.strategyand.pwc.com/br/pt/inovacao-brasil-2020.html

Thneibat, M. M., Obeidat, A. M., Obeidat, Z. M., Al-Dweeri, R., & Thneibat, M. (2022). Promoting Radical Innovation Through Performance-Based Rewards: The Mediating Role of Knowledge Acquisition and Innovative Work Behavior. *International Journal of Innovation and Technology Management*, *19*(2). https://doi.org/10.1142/S0219877022500055

Thunnissen, M., Boselie, P., & Frutier, B. (2013). A review of talent management: "infancy or adolescence?" *The International Journal of Human Resource Management*, *24*(9), 1744–1761.

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, *38*(4), 8–30. https://doi.org/10.1080/09652540903536982

Tushman, M. L., Smith, W. K., & Binns, A. (2011). The Ambidextrous CEO. *Harvard Business Review*, *89*(6), 74–80.

Urban, B., & Verachia, A. (2019). Organisational antecedents of innovative firms: A focus on entrepreneurial orientation in South Africa. *International Journal of Business Innovation and Research*, *18*(1), 128–144. https://doi.org/10.1504/IJBIR.2019.096905

Wang, D., Su, Z., & Guo, H. (2019). Top management team conflict and exploratory innovation: The mediating impact of market orientation. *Industrial Marketing Management*, *82*, 87–95. https://doi.org/10.1016/j.indmarman.2019.02.014

Wheelwright, S. C., & Clark, K. B. (1992). Creating project plans to focus product development. *Harvard Business Review*, *70*(2), 70–82.

Xiong, R., Wei, P., Yang, J., & Cristofini, L. A. (2020). Impact of top executive turnover on firms' R&D investment: evidence from China. *Innovation: Organization and Management*, *00*(00), 1–25. https://doi.org/10.1080/14479338.2020.1836968

Yadav, M. S., Prabhu, J. C., & Chandy, R. K. (2008). Managing the Future: CEO Attention and Innovation Outcomes. *Journal of Marketing*, *71*(4), 84–101. https://doi.org/10.1509/jmkg.71.4.84

Yu, G. J., & Lee, J. (2018). The contrasting moderating effect of exploration on the relationship between stock options/stock ownership and a firm's long-term performance. *Management Decision*, *56*(9), 1956–1968. https://doi.org/10.1108/MD-07-2017-0645

Zhang, M., & Jin, M. (2014). Two staged incentive contract based on efficiency and innovation: A case study of critical chain project management. *Journal of Industrial Engineering and Management*, *7*(4), 919–931. https://doi.org/10.3926/jiem.1154

APPENDIX A – PUBLICATIONS LIST

During the development of the PhD the following papers were published, surpassing compliance with PPGEP's established standards.

Accepted paper for publication in an international journal

Oliveira, P. A. V., & Salerno, M. S. (2021). Taking innovators to the top. *International Journal of Business Innovation and Research*, forthcoming. https://doi.org/10.1504/IJBIR.2021.10043041

The paper "Taking innovators to the top", DOI: 10.1504/IJBIR.2021.10043041, was submitted to the International Journal of Business Innovation and Research in April 8th, 2021, and accepted in July 18th, 2021. The current status in the journal platform is "Entering Publication Schedule".

The International Journal of Business Innovation and Research, ISSNs 1751-0252 (print) and 1751-0260 (online), is classified, according to Qualis Periódicos, as an A3 journal in the 2017-2020 quadrennium.

Papers published in conference proceedings

Oliveira, P. A. V., & Salerno, M. S. (2017). Is the Career in Radical Innovation Management Well Stimulated in Companies? Empirical Evidences. *XXI Semead*.

Oliveira, P. A. V., Laurinfo, F. J. B., & Salerno, M. S. (2017). Competências Essenciais: Utilizando os Recursos Humanos para Alavancar a Inovação. *XXIV SIMPEP*.

Oliveira, P. A. V., & Salerno, M. S. (2018). Incentive and Evaluation: Human Resource Practices for Innovation Managers. *XXXVIII ENEGEP*.

Oliveira, P. A. V., Ortiz, M. Z. R., Mendes, S., Salerno, M. S., & Fischer, A. L. (2018). How Do Innovative Companies Use Talent Management and Retention Practices in Brazilian Innovative Companies? A Comparative Study. *First International Meeting of Comparative Studies on Contextual and Institutions in Human Resource Management*.

Barros, L. S. da S., Oliveira, P. A. V., & Salerno, M. S. (2019). Social Innovation: what it is mean? *R&D Management Conference*.

Rodrigues, B. G., Barros, L. S. S., & Oliveira, P. A. V. (2019, June). Public Transport Integration: A Proposal for a Single Fare in Rio de Janeiro City. *Gerpisa*.

APPENDIX B – CASE STUDY RESEARCH PROTOCOL

Section A: Case Study Overview	
Basic information/ Conceptual framework	Strategic innovation has increasingly become an important part of the success of established firms. An organization's capacity to innovate is closely related to the employees' capabilities and motivation, but strategic innovation career has shown a lack of potential for growth, given the high number of side-lined careers and dismissals. Nevertheless, scholars claim that individuals with entrepreneur skills can prosper in established companies as they aim for the availability of enriching relationships, access to resources, and legitimacy associated with the company's name, bringing value to the market and to the world. Companies can benefit from having people experienced in innovation in the TMT for their knowledge in innovation management, and the inclination to take risks. The purpose of the research problem is to clarify and understand the misfit evidenced by the literature between HRM and strategic innovation management practices in established companies.

Important questions	• How do companies that develop strategic innovation structure themselves, assign roles, evaluate and reward people who work with strategic innovation? What are the evaluation and reward criteria for leaders in other areas? Are there differences in HR policies? Is there a problem with retaining people who work with strategic innovation?
	• Is the strategic innovation function legitimized in the company?
	  ○ Is there an innovation area/function in the company?
	  ○ What is your location in the company's structure?
	  ○ Is it possible for a leader to pursue a career within innovation?
	• Are there strategic innovation leaders in executive positions?
	• Is there interaction between executives and strategic innovation projects and exposure of their leaders?

Research objectives	The general objective of this research is to verify how established companies, which seek innovation as a competitive advantage, are structured and deal with issues related to HRM within the strategic innovation function to mitigate their inconsistencies with the traditional HRM systems in use. The specific objectives are: (1) understanding the HRM aspects related to the strategic innovation management; (2) to identify the HRM practices that most impact the strategic innovation employees work activities; (3) to verify the presence of representing members from innovation and technology areas in strategic positions of the company; (4) to understand the strategic innovation function in terms of roles, talent management, evaluation, development and rewards; and (5) the impact of uncertainties on strategic innovation management's work.
Research questions	1. Which aspects of the human resources system are most related to the strategic innovation development in established innovative companies? 2. How these human resource aspects are used to overcome strategic innovation challenges, in the attempt of enhancing innovation outcomes?
Theoretical framework	Strategic innovation. People management. HRM. Evaluation and incentives. Talent management. CEO. Strategic innovation roles and positions.
Role of the protocol in the guidance of researchers	Guide the research so that the researcher is able to perform qualitative exploratory research.

<table>
<tr><th colspan="5">Section B: Data Collection Procedures</th></tr>
<tr><th>Research question</th><th>Constructs</th><th>Evidence Sources</th><th>Threats to Validation</th><th>Expected conclusions</th></tr>
<tr><td>Question 1: Which aspects of the human resources system are most related to the legitimation of the strategic innovation function in established innovative companies?</td><td>Strategic innovation legitimation; Perceived career risk; Strategic innovation roles and positions; Talent management; HRM practices.</td><td>Literature reviews, HRM survey database, interviews, observations and secondary sources made available by the company, such as documents or systems.</td><td rowspan="2">Not having access to the most appropriate people to answer the research questions; having interpretation problems for not using the appropriate vocabulary for the subject, which is accessible to respondents; not obtaining complete information because innovation is a strategic issue for the business, especially aspects related to project decisions.</td><td>Understand HRM aspects linked to strategic innovation in established companies.</td></tr>
<tr><td>Question 2: How these human resource aspects are used to overcome strategic innovation challenges, in the attempt of enhancing innovation outcomes?</td><td>Strategic innovation legitimation; Perceived career risk; Strategic innovation roles and positions; Talent management; HRM practices.</td><td>Interviews, observations, and secondary sources made available by the company, such as documents or systems.</td><td>Understand the roles created for the strategic innovation function, how they can help in the political articulation for resources within the company and how the possible career paths within this function take place.</td></tr>
<tr><td>Expected preparation, prior to field research</td><td colspan="4">• Develop a theoretical conceptual framework based on a previous literature review that will guide data collection and analysis;
• Prepare a semi-structured questionnaire based on this theoretical framework;
• Identify candidate companies;
• Identify strategic innovation leaders, select interviewees in positions related to them;
• Identify the interviewees' profile.</td></tr>
<tr><td>Who will be interviewed?</td><td colspan="4">• People management consultants with extensive knowledge in the area;
• Responsible for strategic innovation projects and function;
• Responsible for the company's HRM system;
• Responsible for management positions, vice-presidency, CIO, presidency and CEO of the company.</td></tr>
<tr><td>Number of cases</td><td colspan="4">• 2 companies, each with 2 mini cases.</td></tr>
<tr><td>Case selection</td><td colspan="4">• Established companies that systematically develop strategic innovation projects internally.</td></tr>
<tr><td>How cases will be requested</td><td colspan="4">• Through a formal request addressed to the company selected for the case, using the institutional support of the university, and accompanied by a proposal capable of showing the value that the research can bring to the company. If the attempt is unsuccessful, strategic innovation leaders will be invited individually to participate in the survey, with subsequent request for authorization from the company, ensuring the confidentiality of all information related to the company and employees.</td></tr>
<tr><td>Case names</td><td colspan="4">Case A1; Case A2; Case B1; Case B2.</td></tr>
<tr><td>Role of researchers in field research</td><td colspan="4">Collect data through interviews with several employees of the companies to avoid bias. Collect secondary data provided by the company and available on the Internet.</td></tr>
</table>

Section C: Data Collection			
Documents			
Data collection from the company and through secondary public documents referring to its hierarchical and physical structure and resources for innovation, as well as the existing roles and positions in the work with strategic innovation.			
Questions	**HRM managers**	**Innovation managers**	**Directors to TMT**
1. What is your role and the activities you perform?	x	x	x
2. What are the characteristics of some of the projects you were involved in? What was their duration? Were there uncertainties related to them?		x	x
3. What is the involvement of executives with strategic innovation projects? Is there interaction between innovation managers and company executives?		x	x
4. Is it possible to develop a career in innovation?	x	x	x
5. To what extent of development does the strategic innovation function accompany strategic innovation projects?		x	x
6. How is the HRM system aimed at managers and directors in the company? Are there differences in systems aimed at operational/analysts, managers, directors and executives?	x		x
7. How is the HRM system in the company?		x	
8. What is the company's career policy?	x		
9. Is there a strategic action for the development and movement of people?	x		x
10. What are the possible career paths in the innovation area? Are these trajectories discussed with employees?	x		
11. How is the evaluation process in the company? By whom is the individual evaluated? What are the indicators used in these evaluations? When are goals established, publicized and closed? Who sets the goals? How does evaluation feedback occur?	x	x	x
12. Are there team goals? How are they developed?	x	x	x
13. Is there any impact on an employee's evaluation when he is responsible for a project that has been cancelled?	x	x	x
14. Is there a difference between the ways of evaluating strategic innovation employees and people from other areas?	x		
15. What are the existing rewards aimed at strategic innovation employees?	x		
16. What are the rewards you receive or can receive?		x	x
17. Is there any relationship between assessment results and rewards? Are they linked to the success of projects?	x	x	x

Interview procedures	• Identify key people for interviews; • Obtaining contact details for these people; • Schedule meetings to conduct the interviews; • Check the possibility of conducting interviews in person or remotely; • Check the availability of each respondent; • Check the possibility of recording the interview.
Transcription procedures	• Be prepared to record the interviews (if the respondent allows); • Take notes during interviews; • After the interviews, write a full interview report to supplement the information using impressions and data collected by the interviewers.

APPENDIX C – MOST INNOVATIVE COMPANIES' CEO DATABASE

Below we present the data collected for carrying out the CEO analysis presented in Section 6.1.

Brazil

2016

Company	CEO	Background	Classification 2016	Fonte
Embraer	Paulo Cesar de Souza e Silva	Comercial, financeiro, projetos	Commercial	https://www.sunoresearch.com.br/tudo-sobre/paulo-cesar-de-souza-e-silva/ https://www.linkedin.com/in/paulo-cesar-de-souza-e-silva-486b01186/details/experience/
3M	Jorge Lopez	Qualidade	Quality	https://www.linkedin.com/in/jorge-lopez-64145516/
Natura	João Paulo Ferreira	Operações	Operations	https://www.linkedin.com/in/jo%C3%A3o-paulo-ferreira-b92245/
Whirlpool	João Carlos Brega	Financeiro	Financial	https://www.linkedin.com/in/joao-carlos-brega/?originalSubdomain=br
Itaú Unibanco	Roberto Setubal	Empresa familiar	Family Business	https://www.sunoresearch.com.br/tudo-sobre/roberto-setubal/
Grupo Boticário	Artur Grynbaum	Comercial	Commercial	https://www.linkedin.com/in/artur-grynbaum-0b113b1a6/
WEG	Harry Schmelzer Jr	Vendas	Commercial	https://ri.weg.net/governanca-corporativa/diretoria-executiva/
Bradesco	Luiz Carlos Trabuco Cappi	Marketing	Commercial	https://www.sunoresearch.com.br/tudo-sobre/luiz-carlos-trabuco/
Embraco	Luis Felipe Dau	Marketing	Commercial	https://www.linkedin.com/in/luisdau/
Ambev	Bernardo Pinto Paiva	Operações, Vendas, Logística e Finanças	Operations	https://forbes.com.br/listas/2015/06/10-melhores-ceos-do-brasil-em-2015/
Basf	Ralph Schweens	Vendas	Commercial	https://www.linkedin.com/in/ralphschweensbasf/

L'Oreal	An Verhulst	Produtos e marketing	Innovation	https://www.linkedin.com/in/an-verhulst-santos-2525a58a/
Braskem	Fernando Musa	Planejamento	Strategy	https://www.linkedin.com/in/fernando-musa-505133/
Petrobrás	Pedro Parente	Setor público	Public Sector	https://www.linkedin.com/in/pedro-parente-0283b5a4/
Totvs	Laercio Jose de Lucena Cosentino	Fundador	Entrepreneur	https://www.bloomberg.com/profile/person/6567039
Dow	Ramiro De La Cruz	P&D, RH, Qualidade e Comercial	Innovation	https://www.linkedin.com/in/ramiro-a-de-la-cruz-11aa511b/
Aché	Paulo Nigro	Operações	Operations	https://www.linkedin.com/in/paulo-nigro/?originalSubdomain=br
IBM	Marcelo Porto	Vendas	Commercial	https://www.linkedin.com/in/marcelo-porto/?originalSubdomain=br
Grupo Netshoes	Marcio Kumruian	Fundador	Entrepreneur	https://www.linkedin.com/in/marciokumruian/
GE do Brasil	Gilberto Peralta	Marketing	Commercial	https://www.linkedin.com/in/gilberto-peralta-91072b5/
John Deere	Paulo Herrmann	Marketing e vendas	Commercial	https://www.linkedin.com/in/paulo-herrmann-b89366a/?originalSubdomain=br
Mahle Metal Leve	Claus Hoppen	Comercial	Commercial	https://www.linkedin.com/in/claus-hoppen-2932b3107/?originalSubdomain=br
Stefanini	Marco Stefanini	Fundador	Entrepreneur	https://www.linkedin.com/in/stefaninimarco/?originalSubdomain=br
DuPont	Priscila Vansetti	Estratégia, marketing	Strategy	https://www.linkedin.com/in/priscila-vansetti-machado-81139713/
Coelce - Cia Energética do Ceará	Abel Alves Rochinha	Financeiro	Financial	https://www.linkedin.com/in/abel-rochinha-789400/
Grupo Fleury	Carlos Alberto Iwata Marinelli	Novos Negócios, Estratégia, Inovação, Sustentabilidade e Operações de Negócios	Innovation	https://www.bloomberg.com/profile/person/18884059

Unilever	Fernando Fernandez	Marketing	Commercial	https://www.linkedin.com/in/fernando-fernandez-227960227/
Samsung	Chang Hoon Yoon	Engineering	Innovation	https://www.meioemensagem.com.br/home/marketing/2017/09/29/samsung-chega-aos-30-anos-de-operacao-no-brasil.html https://www.linkedin.com/in/chang-hoon-yoon-9bb6937b/?originalSubdomain=kr
Cielo	Eduardo Campozana Gouveia	Vendas e marketing	Commercial	https://www.sunoresearch.com.br/tudo-sobre/eduardo-gouveia/
B2W Digital	Anna Christina Ramos Saicali	Tecnologia e RH	Innovation	https://www.linkedin.com/in/anna-saicali-473b893b/
Fibria Celulose	Marcelo Castelli	Estratégia e suprimentos	Strategy	https://www.sunoresearch.com.br/tudo-sobre/marcelo-castelli/
Electrolux	Ruy Hirschheimer	Assorted	Assorted	https://www.bloomberg.com/profile/person/15902335
Hospital Albert Einstein	Claudio Luiz Lottenberg	Setor público	Public Sector	https://www.linkedin.com/in/clottenberg/?originalSubdomain=br
Oxiteno	Thilo Mannhardt	Assorted	Assorted	https://ri.ultra.com.br/Show.aspx?IdMateria=8FXK6bbhpn4Plnm5IG1kQw==&IdCanal=8VLky7Aww63ZjUjPoYbI2g==
Kroton Educacional	Rodrigo Calvo Galindo	Operações	Operations	https://www.linkedin.com/in/rodrigo-galindo-728411102/
Lorenzetti	Eduardo Coli	Consultoria	Consultancy	https://books.google.com.br/books?id=Saf9twd7Ay8C&pg=PA43&lpg=PA43&dq=%22eduardo+coli%22+carreira&source=bl&ots=ycZFnxgEZL&sig=ACfU3U2QJkfe0LZ_thc5igDOB3pswweqhw&hl=pt-BR&sa=X&ved=2ahUKEwit-tKZysHsAhVcHrkGHfYyDM04ChDoATAGegQIBRAC#v=onepage&q=%22eduardo%20coli%22%20carreira&f=false
Rhodia	José Borges Matias	Compras	Commercial	https://www.linkedin.com/in/matias-jose/?originalSubdomain=br
Janssen	Bruno Costa Gabriel	Vendas e marketing	Commercial	https://www.linkedin.com/in/bruno-costa-gabriel-22891014/

Vale	Murilo Ferreira	Financeiro	Financial	https://www.bloomberg.com/profile/person/1921488
AES	Britaldo Pedrosa Soares	Financeiro	Financial	https://www.marketscreener.com/business-leaders/Britaldo-Pedrosa-Soares-07S09J-E/biography/
Votorantim Metais	Tito Martins	Financeiro	Financial	https://www.nexaresources.com/pt/about-profile#1/Tito-Martins
Algar Telecom	Jean Carlos Borges	Financeiro e operações	Financial	https://ri.algartelecom.com.br/faq/diretoria/
Cristália	Eduardo Job	https://www.linkedin.com/in/eduardo-job-35a72611/?originalSubdomain=br	Health Sector	https://www.linkedin.com/in/eduardo-job-35a72611/?originalSubdomain=br
Biolab Sanus	Cleiton Marques	Fundador	Entrepreneur	https://ebdicorp.com.br/entrevista-com-cleiton-marques-biolab/
BRF	Pedro Faria	Operações	Operations	https://www.linkedin.com/in/pedro-faria-4a0885183/?originalSubdomain=br
Mondelez	Augusto Lemos	Vendas	Commercial	https://www.linkedin.com/in/augustolemos/?originalSubdomain=br
Empresas Artecola	Eduardo Kunst	Empresa familiar	Family Business	http://www.artecolaquimica.com.br/noticias/artecola-comemora-70-anos-com-colaboradores-e-acionistas/2
Sanof	Pius Hornstein	Product,Operações, estratégia, mkt,	Innovation	https://www.linkedin.com/in/pius-s-hornstein-msc-phd-226469/?originalSubdomain=cn
CNH	Vilmar Fistarol	Compras	Commercial	https://www.linkedin.com/in/vilmar-fistarol-0b3102a5/
Ampla Energia e Serviços	Abel Alves Rochinha	Financeiro	Financial	https://www.linkedin.com/in/abel-rochinha-789400/
Embratel	José Formoso Martínez	Operações	Operations	https://computerworld.com.br/negocios/embratel-anuncia-jose-formoso-martinez-como-novo-presidente/
Tecnisa	Meyer Joseph Nigri	Fundador	Entrepreneur	https://www.sunoresearch.com.br/tudo-sobre/meyer-joseph-nigri/

Cisco	Laércio Albuquerque	Vendas	Commercial	https://www.linkedin.com/in/laercioabq/?originalSubdomain=br
Elektro Eletricidade e Serviços	Marcio Fernandes	Finanças	Financial	https://www.sunoresearch.com.br/tudo-sobre/marcio-fernandes/
Eurofarma	Maurízio Billi	Empresa familiar	Family Business	https://www.sunoresearch.com.br/tudo-sobre/maurizio-billi/
Tigre	Otto von Sothen	Comercial	Commercial	https://www.linkedin.com/in/otto-von-sothen-162b844/?originalSubdomain=br
Rexam Beverage Can South America (BCSA)	Carlos Pires	Engenharia, qualidade, operações	Innovation	https://www.linkedin.com/in/carlos-pires-07317420/?originalSubdomain=br
Grupo Segurador Banco do Brasil e Mapfre	Luis Gutiérrez	Comercial	Commercial	https://www.mapfre.com/pt-br/executivos/luis-gutierrez-mateo/ https://eventos.cnseg.org.br/palestrantes/luis-gutierrez/
Ericsson	Sergio Quiroga	Vendas	Commercial	https://www.linkedin.com/in/sergioquirogacunha/?originalSubdomain=br
Prati-Donaduzzi	Eder Maffissoni	Comercial	Commercial	https://www.linkedin.com/in/eder-fernando-maffissoni/?originalSubdomain=br
Nestlé	Juan Carlos Marroquín	Assorted	Assorted	https://www.bloomberg.com/profile/person/17616914
Serasa Experian	José Luiz Rossi	Consultoria	Consultancy	https://www.linkedin.com/in/jose-luiz-rossi-b78106114/?originalSubdomain=br
IGUI Piscinas	Filipe Sisson	Fundador	Entrepreneur	https://exame.com/pme/com-quarentena-venda-de-piscinas-dispara-e-igui-cresce-123-em-junho/
Amil Assistência Médica	Claudio Lottenberg	Operações	Operations	https://www.linkedin.com/in/clottenberg/?originalSubdomain=br
Vigor	Gilberto Meirelles Xando Baptista	Financeiro	Financial	https://www.bloomberg.com/profile/person/15227365
Duratex	Antonio Joaquim de Oliveira	Suprimentos	Commercial	https://www.linkedin.com/in/antonio-joaquim-de-oliveira/?originalSubdomain=br

Magazine Luiza	Frederico Trajano Inácio Rodrigues	Family business	Family Business	https://www.sunoresearch.com.br/tudo-sobre/frederico-trajano/
Avon Cosméticos	David Legher	Project, Marketing, operations, strategy, financial	Innovation	https://www.linkedin.com/in/davidlegher/?locale=pt_BR
MAN	Roberto Cortes	Financeiro	Financial	https://www.linkedin.com/in/roberto-cortes-934169/
Adama	Rodrigo Gutierrez	Operações	Operations	https://www.linkedin.com/in/rodrigogutierrezbrazil/?originalSubdomain=br
Concremat	Mauro Viegas Filho	Empresa familiar	Family Business	https://www.linkedin.com/in/mauro-ribeiro-viegas-filho-aa236a9/?originalSubdomain=br
Santander	Sérgio Rial	Financeiro	Financial	https://www.linkedin.com/in/sergio-rial-12611951/?originalSubdomain=br
Monsanto do Brasil Ltda	Rodrigo Santos	Sales, marketing, strategy and technological development	Innovation	https://www.linkedin.com/in/rodrigo-santos-683299/ https://www.bayer.com/en/regional-commercial-leadership-rodrigo-santos.aspx
Mercedes-Benz	Philipp Schiemer	Product, Marketing, Sales	Innovation	https://www.linkedin.com/in/philipp-schiemer-510a63b5/?originalSubdomain=br
Goodyear	Henry Dumortier	Product, Comercial, mkt, sales, Operations and Financial	Commercial	https://www.linkedin.com/in/henrydumortier/
Peugeot Citroen	Ana Theresa Borsari	Marketing	Commercial	https://www.linkedin.com/in/ana-borsari/?originalSubdomain=br
Light	Ana Marta Horta Veloso	Research, Financeiro	Innovation	https://www.bloomberg.com/profile/person/3729917
CPFL Energia	Andre Dorf	Estratégia	Strategy	https://www.linkedin.com/in/andre-dorf-294227174/
EDP - Energias do Brasil	Miguel Setas	Marketing	Commercial	https://www.linkedin.com/in/miguel-setas-18579318/
Camargo Corrêa	Heinz-Peter Elstrodt	Consultoria	Consultancy	https://petronoticias.com.br/camargo-correa-anuncia-novo-presidente-do-seu-conselho-de-administracao/

Owens-Illinois	Miguel Alvarez	Assorted	Assorted	https://www.linkedin.com/in/miguel-i-%C3%A1lvarez-a5945239/?trk=public_profile_browsemap
Liberty Seguros	Carlos Magnarelli	Financeiro	Financial	https://www.linkedin.com/in/carlos-magnarelli-088b9a2/?originalSubdomain=br
Multiplus	Roberto Medeiros	Operations	Operations	https://www.linkedin.com/in/roberto-medeiros-85457841/?originalSubdomain=br
Procter & Gamble	Alberto Carvalho	Consultoria	Consultancy	https://www.linkedin.com/in/alberto-carvalho-9b64473/
Votorantim Cimentos	Walter Dissinger	Technology, Estratégia e Desenvolvimento de Negócios, mkt, engineering, sales, product	Innovation	https://www.linkedin.com/in/walter-dissinger/?originalSubdomain=br
Sodexo Pass do Brasil Serviços e Comércio	Mauro De Marchi	Financeiro	Financial	https://www.linkedin.com/in/mauro-de-marchi-3420741/
Johnson e Johnson Medical Devices	Márcio Coelho	Produtos	Innovation	https://www.linkedin.com/in/marcio-c-coelho/
Cargill Agrícola	Luiz Pretti	Financeiro	Financial	https://www.linkedin.com/in/luiz-pretti-317594155/?originalSubdomain=br
Máquinas Agricolas Jacto	Fernando Gonçalves Neto	P&D	Innovation	https://www.linkedin.com/in/fernando-gon%C3%A7alves-neto-64672a13/
Algar Agro	Murilo Braz Sant'anna	Não encontrado	Assorted	-
White Martins Gases Industriais	Domingos Bulus	Engenharia, produção	Innovation	https://www.linkedin.com/in/domingos-bulus-901b838/?originalSubdomain=br
Estácio	Pedro Thompson	Financeiro	Financial	https://www.linkedin.com/in/pedro-thompson-06765090/?originalSubdomain=br
Caio Induscar	José Ruas Vaz	Dono	Entrepreneur	https://www.istoedinheiro.com.br/noticias/negocios/20091202/papa-das-catracas/11515

Duas Rodas Industrial	Leonardo Fausto Zipf	Comercial	Commercial	https://www.nsctotal.com.br/colunistas/estela-benetti/videos-mostram-as-trajetorias-dos-industriais-homenageados-pela-fiesc
Sotreq-Caterpillar	Odair Renosto	Finanças, planejamento de materiais, negócios, introdução de novos produtos, operações de produção e estratégia de produtos	Innovation	http://g1.globo.com/sp/piracicaba-regiao/noticia/2014/03/executivo-que-atua-em-genebra-ira-presidir-caterpillar-partir-de-junho.html
Bayer	Theo van der Loo	Marketing	Commercial	https://www.linkedin.com/in/theovanderloo/?originalSubdomain=br
DSM	Maurício Adade	Marketing	Commercial	https://www.linkedin.com/in/mauricio-adade-9bb403/?originalSubdomain=br
Atento Brasil	Mário Câmara	Financeiro	Financial	https://www.linkedin.com/in/macamara/?originalSubdomain=br
Kimberly-Clark	Sergio Cruz	Marketing	Commercial	https://www.linkedin.com/in/sergiocruz2/
São Martinho	Fábio Venturelli	Estratégia	Strategy	https://www.agrolink.com.br/noticias/fabio-venturelli-e-o--executivo-de-valor-2012--pelo-setor-sucroenergetico_149348.html

2017

Company	**CEO**	**Background**	**Classification 2017**	**Source**
Embraer	Paulo Cesar de Souza e Silva	Comercial	Commercial	https://www.sunoresearch.com.br/tudo-sobre/paulo-cesar-de-souza-e-silva/
Whirlpool	João Carlos Brega	Financeiro	Financial	https://www.linkedin.com/in/joao-carlos-brega/?originalSubdomain=br
3M	Jorge Lopez	Qualidade	Quality	https://www.linkedin.com/in/jorge-lopez-64145516/
Natura	João Paulo Ferreira	Operações	Operations	https://www.linkedin.com/in/jo%C3%A3o-paulo-ferreira-b92245/
Bradesco	Luiz Carlos Trabuco Cappi	Marketing	Commercial	https://www.sunoresearch.com.br/tudo-sobre/luiz-carlos-trabuco/
Grupo Boticário	Artur Grynbaum	Comercial	Commercial	https://www.linkedin.com/in/artur-grynbaum-0b113b1a6/
WEG	Harry Schmelzer Jr	Vendas	Commercial	https://ri.weg.net/governanca-corporativa/diretoria-executiva/
Embraco	Luis Felipe Dau	Marketing	Commercial	https://www.linkedin.com/in/luisdau/
Itaú Unibanco	Candido Botelho Bracher	Financial	Financial	https://www.linkedin.com/in/candido-bracher/?originalSubdomain=br
Aché	Paulo Nigro	Operações	Operations	https://www.linkedin.com/in/paulo-nigro/?originalSubdomain=br
Petrobrás	Pedro Parente	Setor público	Public Sector	https://www.linkedin.com/in/pedro-parente-0283b5a4/ https://www.sunoresearch.com.br/tudo-sobre/pedro-parente/
Cristália	Eduardo Job	Administração hospitalar	Health Sector	https://www.linkedin.com/in/eduardo-job-35a72611/?originalSubdomain=br
Hospital Albert Einstein	Sidney Klajner	Health	Health Sector	https://www.linkedin.com/in/sidney-klajner-b3b50043/?originalSubdomain=br

Basf	Ralph Schweens	Vendas	Commercial	https://www.linkedin.com/in/ralphschweensbasf/
Cielo	Eduardo Campozana Gouveia	Commercial	Commercial	https://www.sunoresearch.com.br/tudo-sobre/eduardo-gouveia/
John Deere	Paulo Herrmann	Marketing e vendas	Commercial	https://www.linkedin.com/in/paulo-herrmann-b89366a/?originalSubdomain=br
Samsung	Chang Hoon Yoon	Engineer	Innovation	https://www.meioemensagem.com.br/home/marketing/2017/09/29/samsung-chega-aos-30-anos-de-operacao-no-brasil.html
Tecnisa	Joseph Meyer Nigri	Family business	Family Business	https://www.linkedin.com/in/josephnigri/?originalSubdomain=br
Braskem	Fernando Musa	Planejamento	Strategy	https://www.linkedin.com/in/fernando-musa-505133/
Duratex	Antonio Joaquim de Oliveira	Suprimentos	Commercial	https://www.linkedin.com/in/antonio-joaquim-de-oliveira/?originalSubdomain=br
GE	Daurio Speranzini Jr	Sales	Commercial	https://www.linkedin.com/in/daurio-speranzini-jr-a87a4517/?originalSubdomain=br
AES	Charles Lenzi	Operations	Operations	https://www.linkedin.com/in/charles-lenzi-3544381/
Ambev	Bernardo Pinto Paiva	Operações	Operations	https://forbes.com.br/listas/2015/06/10-melhores-ceos-do-brasil-em-2015/
BRF	Pedro Faria	Operações	Operations	https://exame.com/negocios/quem-e-pedro-faria-o-novo-presidente-da-brf/https://www.linkedin.com/in/pedro-faria-4a0885183/?originalSubdomain=br
Avon Cosméticos	David Legher	Marketing	Commercial	https://www.linkedin.com/in/davidlegher/?locale=pt_BR
Vivo	Eduardo Navarro de Carvalho	Strategy	Strategy	https://www.linkedin.com/in/eduardonc/?originalSubdomain=es

EMS	Carlos Sanchez	Family business	Family Business	https://www.sunoresearch.com.br/tudo-sobre/carlos-sanchez/
Fleury	Carlos Alberto Iwata Marinelli	Inovação	Innovation	https://www.bloomberg.com/profile/person/18884059
Stefanini	Marco Stefanini	Fundador	Entrepreneur	https://www.linkedin.com/in/stefaninimarco/?originalSubdomain=br
IBM	Marcelo Porto	Vendas	Commercial	https://www.linkedin.com/in/marcelo-porto/?originalSubdomain=br
Enel	Carlo Zorzoli	Project, engineer, sales, operations	Innovation	https://www.linkedin.com/in/carlozorzoli/
Solvay	José Borges Matias	Engineering	Innovation	https://www.linkedin.com/in/matias-jose/?originalSubdomain=br
L'Oreal	An Verhulst	Produtos	Innovation	https://www.linkedin.com/in/an-verhulst-santos-2525a58a/
Algar Agro	Douglas Waldemar Vanderlei Ribeiro	Trader	Financial	https://www.linkedin.com/in/douglas-ribeiro-9468061/?originalSubdomain=br
Adama	Rodrigo Gutierrez	Operações	Operations	https://www.linkedin.com/in/rodrigogutierrezbrazil/?originalSubdomain=br
Eurofarma	Maurízio Billi	Empresa familiar	Family Business	https://www.sunoresearch.com.br/tudo-sobre/maurizio-billi/
Totvs	Laercio Jose de Lucena Cosentino	Fundador	Entrepreneur	https://www.bloomberg.com/profile/person/6567039
Mahle	Claus Hoppen	Comercial	Commercial	https://www.linkedin.com/in/claus-hoppen-2932b3107/?originalSubdomain=br
Santander	Sérgio Rial	Financeiro	Financial	https://www.linkedin.com/in/sergio-rial-12611951/?originalSubdomain=br
Groupe PSA	Ana Theresa Borsari	Marketing	Commercial	https://www.linkedin.com/in/ana-borsari/?originalSubdomain=br
Bayer	Theo van der Loo	Marketing	Commercial	https://www.linkedin.com/in/theovanderloo/?originalSubdomain=br

Vale	Fabio Schvartsman	Operation	Operations	https://www.sunoresearch.com.br/tudo-sobre/fabio-schvartsman/
Banco Original	Marcio Linares	Financial	Financial	https://www.linkedin.com/in/marcio-linares-2682413a/?originalSubdomain=br
Amil	Sergio Ricardo Santos	Strategy	Strategy	https://www.linkedin.com/in/sergio-ricardo-santos-%F0%9F%8F%B3%EF%B8%8F%E2%80%8D%F0%9F%8C%88-0b4a6b3/?originalSubdomain=br
MAN	Roberto Cortes	Financeiro	Financial	https://www.linkedin.com/in/roberto-cortes-934169/
Grupo Netshoes	Marcio Kumruian	Fundador	Entrepreneur	https://www.linkedin.com/in/marciokumruian/
Algar Telecom	Jean Carlos Borges	Financeiro	Financial	https://ri.algartelecom.com.br/faq/diretoria/
Mercado Livre	Stelleo Tolda	Co-founder	Entrepreneur	https://www.linkedin.com/in/stelleotolda/ https://www.istoedinheiro.com.br/na-america-latina-372-mil-pessoas-vivem-de-vender-no-mercado-livre-diz-stelleo-tolda-cofundador-do-mercado-livre/
TIM	Stefano de Angelis	Strategy	Strategy	https://exame.com/negocios/tim-deve-nomear-gerente-de-angelis-como-ceo-diz-font/
Fibria Celulose	Marcelo Castelli	Estratégia	Strategy	https://www.sunoresearch.com.br/tudo-sobre/marcelo-castelli/
Syngenta	Laercio Giampani	Assorted	Assorted	https://www.linkedin.com/in/laercio-giampani-1a690319b/?originalSubdomain=br
Electrolux	Ricardo Cons	Vendas	Commercial	https://www.linkedin.com/in/ricardo-cons-25269710/
Votorantim Metais	Tito Martins	Financeiro	Financial	https://www.nexaresources.com/pt/about-profile#1/Tito-Martins
CNH Industrial	Vilmar Fistarol	Compras	Commercial	https://www.linkedin.com/in/vilmar-fistarol-0b3102a5/

Monsanto/Climate	Rodrigo Santos	Produtos	Innovation	https://www.linkedin.com/in/rodrigo-santos-683299/
Algar Tech	Tatiane Panato	Financial	Financial	https://www.linkedin.com/in/tatiane-panato-5b866125/?originalSubdomain=br
InterCement	Nelson Tambelini Junior	RH	Human resource	https://www.linkedin.com/in/nelson-tambelini-junior-a7861830/?originalSubdomain=br
Procter & Gamble	Alberto Carvalho	Marketing	Commercial	https://www.linkedin.com/in/alberto-carvalho-9b64473/
CPFL Energia	Andre Dorf	Estratégia	Strategy	https://www.linkedin.com/in/andre-dorf-294227174/
Embratel	José Formoso Martínez	Comercial	Commercial	https://computerworld.com.br/negocios/embratel-anuncia-jose-formoso-martinez-como-novo-presidente/
Kroton	Rodrigo Calvo Galindo	Operações	Operations	https://www.linkedin.com/in/rodrigo-galindo-728411102/
Anima Educação	Daniel Castanho	Fundador	Entrepreneur	https://www.linkedin.com/in/daniel-castanho/
Oxiteno	Frederico Curado	Financial	Financial	https://www.bloomberg.com/profile/person/2004589
Janssen	Bruno Costa Gabriel	Vendas e marketing	Commercial	https://www.linkedin.com/in/bruno-costa-gabriel-22891014/
Elektro Eletricidade e Serviços	Giancarlo Souza	Engineering, Planning and Operation	Innovation	https://www.linkedin.com/in/giancarlo-souza-9bb08116/
Tigre	Otto von Sothen	Comercial	Commercial	https://www.linkedin.com/in/otto-von-sothen-162b844/?originalSubdomain=br

Lorenzetti	Eduardo Coli	Consultoria	Consultancy	https://books.google.com.br/books?id=Saf9twd7Ay8C&pg=PA43&lpg=PA43&dq=%22eduardo+coli%22+carreira&source=bl&ots=ycZFnxgEZL&sig=ACfU3U2QJkfe0LZ_thc5igDOB3pswweqhw&hl=pt-BR&sa=X&ved=2ahUKEwit-tKZysHsAhVcHrkGHfYyDM04ChDoATAGegQIBRAC#v=onepage&q=%22eduardo%20coli%22%20carreira&f=false
BB Mapfre	Fernando Barbosa de Oliveira	Financial	Financial	https://www.revistaapolice.com.br/2017/07/banco-do-brasil-bb-mapfre/
Thyssenkrupp	Marcelo Nery	Operations	Operations	https://www.linkedin.com/in/marcelo-nery-b478b855/?originalSubdomain=br
Claro	Jose Felix	Operations	Operations	https://www.linkedin.com/in/jos%C3%A9-f%C3%A9lix-416630/?originalSubdomain=br
Ingredion	Ernesto Pousada	Operations	Operations	https://www.linkedin.com/in/ernesto-pousada-7828a9135/
Liberty Seguros	Carlos Magnarelli	Financeiro	Financial	https://www.linkedin.com/in/carlos-magnarelli-088b9a2/?originalSubdomain=br
Americas Serviços Médicos	Claudio Lottenberg	Médico	Health Sector	http://medicossa.com.br/claudio-lottenberg-se-nao-tivesse-abandonado-o-consultorio-nao-teria-ajudado-construir-tantas-iniciativas-importantes-e-que-hoje-beneficiam-https://www.linkedin.com/in/clottenberg/?originalSubdomain=brtantas-pessoas/
MRV Engenharia	Rafael Menin e Eduardo Fisher	Family business	Family business	https://www.mrv.com.br/institucional/pt/relacionamentos/noticias/para-a-mrv-maior-construtora-do-pais-o-lema-e-se-nao-comprar-alugue
Ericsson	Sergio Quiroga	Vendas	Commercial	https://www.linkedin.com/in/sergioquirogacunha/?originalSubdomain=br

AngloGold Ashanti	Camilo Farace	Founder	Entrepreneur	https://www.sunoresearch.com.br/tudo-sobre/meyer-joseph-nigri/
iGUi Piscinas	Filipe Sisson	Empresa familiar	Family Business	https://exame.com/pme/com-quarentena-venda-de-piscinas-dispara-e-igui-cresce-123-em-junho/
DSM	Maurício Adade	Marketing	Commercial	https://www.linkedin.com/in/mauricio-adade-9bb403/?originalSubdomain=br
Microsoft	Paula Bellizia	Sales	Commercial	https://www.linkedin.com/in/paulabellizia/?originalSubdomain=br
Visa	Fernando Teles	Financial	Financial	https://www.linkedin.com/in/fernando-teles-45064a20/?originalSubdomain=br
Sodexo	Andréia Dutra	Human resource	Human resource	https://www.linkedin.com/in/andreiadutra/
UOL Diveo	Gil Torquato	Comercial	Commercial	https://www.youtube.com/watch?v=XjKV9nsGVsg
Reckitt Benckiser	Tahir Malik	Marketing	Commercial	https://www.linkedin.com/in/tahir-malik-25111a2/?originalSubdomain=ae
A.C. Camargo	Vivien Rosso	Marketing	Commercial	http://www.abeclin.org.br/post.php?p=42 https://www.linkedin.com/in/vivien-r-255a63/
Concremat	Mauro Viegas Filho	Empresa familiar	Family Business	https://www.linkedin.com/in/mauro-ribeiro-viegas-filho-aa236a9/?originalSubdomain=br
Sanepar	Mounir Chaowiche	Setor público	Public Sector	https://www.linkedin.com/in/mounir-chaowiche-b64b5053/?originalSubdomain=br
Hermes Pardini	Roberto Santoro	Health	Health Sector	https://www.linkedin.com/in/roberto-santoro-91132037/
General Motors	Carlos Zarlenga	Financial	Financial	https://www.comprecar.com.br/revista/carlos-zarlenga-e-nomeado-presidente-da-gm-do-brasil
ArcelorMittal	Benjamin Baptista Filho	Commercial	Commercial	https://www.linkedin.com/in/benjamin-baptista-filho/?originalSubdomain=br

EDP	Miguel Setas	Marketing	Commercial	https://www.linkedin.com/in/miguel-setas-18579318/
Aker Solutions	Maria Peralta	Production	Operations	https://www.linkedin.com/in/maria-peralta-b4119964/
Mercedes-Benz	Philipp Schiemer	Marketing	Commercial	https://www.linkedin.com/in/philipp-schiemer-510a63b5/?originalSubdomain=br
Caterpillar	Odair Renosto	NPD	Innovation	http://g1.globo.com/sp/piracicaba-regiao/noticia/2014/03/executivo-que-atua-em-genebra-ira-presidir-caterpillar-partir-de-junho.html
Coopercitrus	José Vicente da Silva	Financial	Financial	http://coopercitrus.com.br/index.php?pag=revista&p=materia&codigo=5580
Caixa Seguradora	Laurent Jumelle	Wealth management	Financial	https://www.bloomberg.com/profile/person/20326328
Cisco	Laércio Albuquerque	Vendas	Commercial	https://www.linkedin.com/in/laercioabq/?originalSubdomain=br
Sanofi	Pius Hornstein	Operações	Operations	https://www.linkedin.com/in/pius-s-hornstein-msc-phd-226469/?originalSubdomain=cn
Atento	Mário Câmara	Financial	Financial	https://www.linkedin.com/in/macamara/?originalSubdomain=br
Multiplus	Roberto Medeiros	Operações	Operations	https://www.linkedin.com/in/roberto-medeiros-85457841/?originalSubdomain=br
Volvo	Luis Rezende	Financial	Financial	https://valoragregado.com/2014/01/27/volvo-cars-do-brasil-tem-novo-presidente/

2018

Company	CEO	Background	Classification 2018	Source
Embraer	Paulo Cesar de Souza e Silva	Comercial	Commercial	https://www.sunoresearch.com.br/tudo-sobre/paulo-cesar-de-souza-e-silva/
Whirlpool	João Carlos Brega	Financeiro	Financial	https://www.linkedin.com/in/joao-carlos-brega/?originalSubdomain=br
Petrobrás	Roberto Castello Branco	Finaceiro	Financial	https://www.sunoresearch.com.br/tudo-sobre/roberto-castello-branco/
Natura	João Paulo Ferreira	Operações	Operations	https://www.linkedin.com/in/jo%C3%A3o-paulo-ferreira-b92245/
3M Brasil	Mark Copman	Operations	Operations	https://www.linkedin.com/in/mark-copman-07646/?originalSubdomain=br
WEG	Harry Schmelzer Jr	Vendas	Commercial	https://ri.weg.net/governanca-corporativa/diretoria-executiva/
Cielo	Eduardo Campozana Gouveia	Commercial	Commercial	https://www.sunoresearch.com.br/tudo-sobre/eduardo-gouveia/ https://www.linkedin.com/in/eduardo-gouveia-58a7b281/
Aché	Vânia Nogueira de Alcantara Machado	Comercial	Commercial	https://www.linkedin.com/in/v%C3%A2nia-nogueira-alcantara-machado-63731611/?originalSubdomain=br
Embraco	Luis Felipe Dau	Marketing	Commercial	https://www.linkedin.com/in/luisdau/
Bradesco	Octavio de Lazari Junior	Assorted	Assorted	https://www.sunoresearch.com.br/tudo-sobre/octavio-de-lazari/
Hospital Albert Einstein	Sidney Klajner	Health	Health Sector	https://www.linkedin.com/in/sidney-klajner-b3b50043/?originalSubdomain=br
IBM	Tonny Martins	Financeiro	Financial	https://www.linkedin.com/in/tonnymartins/?originalSubdomain=br https://www.ibm.com/blogs/ibm-comunica/biografia/

CNH Industrial	Vilmar Fistarol	Compras	Operations	https://www.linkedin.com/in/vilmar-fistarol-0b3102a5/
Samsung	Chang Hoon Yoon	Engineer	Innovation	https://www.meioemensagem.com.br/home/marketing/2017/09/29/samsung-chega-aos-30-anos-de-operacao-no-brasil.html https://www.linkedin.com/in/chang-hoon-yoon-9bb6937b/?originalSubdomain=kr
Braskem	Fernando Musa	Estratégia	Strategy	https://www.linkedin.com/in/fernando-musa-505133/ https://www.sunoresearch.com.br/tudo-sobre/fernando-musa/
Itaú Unibanco	Candido Botelho Bracher	Financial	Financial	https://www.linkedin.com/in/candido-bracher/?originalSubdomain=br https://www.sunoresearch.com.br/tudo-sobre/candido-bracher/
Vale	Fabio Schvartsman	Operation	Operations	https://www.sunoresearch.com.br/tudo-sobre/fabio-schvartsman/
Microsoft	Paula Bellizia	Sales	Commercial	https://www.linkedin.com/in/paulabellizia/?originalSubdomain=br
Solvay	José Borges Matias	Engineering	Innovation	https://www.linkedin.com/in/matias-jose/?originalSubdomain=br
Totvs	Laercio Jose de Lucena Cosentino	Fundador	Entrepreneur	https://www.bloomberg.com/profile/person/6567039
Mahle	Sergio Pancini de Sá	Engineering	Innovation	https://ri.mahle.com.br/governanca-corporativa/conselhos-e-diretoria/
Stefanini	Marco Stefanini	Fundador	Entrepreneur	https://www.linkedin.com/in/stefaninimarco/?originalSubdomain=br
Grupo Boticário	Artur Grynbaum	Comercial	Commercial	https://www.linkedin.com/in/artur-grynbaum-0b113b1a6/
Basf	Ralph Schweens	Vendas	Commercial	https://www.linkedin.com/in/ralphschweensbasf/

Kroton	Rodrigo Calvo Galindo	Operações	Operations	https://www.linkedin.com/in/rodrigo-galindo-728411102/
Cristália	Eduardo Job	Administração hospitalar	Health Sector	https://www.linkedin.com/in/eduardo-job-35a72611/?originalSubdomain=br
Fiat Chrysler Automobiles - FCA	Antonio Filosa	Compras	Commercial	https://www.linkedin.com/in/antoniofilosa/?originalSubdomain=br https://valor.globo.com/eu-e/noticia/2020/08/28/antonio-filosa-da-fca-presenca-constante.ghtml
Novartis	Jose Antonio Toledo Vieira	Comercial	Commercial	https://www.linkedin.com/in/jose-antonio-toledo-vieira-024867/?originalSubdomain=br
Fleury	Carlos Alberto Iwata Marinelli	Inovação	Innovation	https://www.bloomberg.com/profile/person/18884059
Amil	Sergio Ricardo Santos	Strategy	Strategy	https://www.linkedin.com/in/sergio-ricardo-santos-%F0%9F%8F%B3%EF%B8%8F%E2%80%8D%F0%9F%8C%88-0b4a6b3/?originalSubdomain=br
Oxiteno	Frederico Curado	Financial	Financial	https://www.bloomberg.com/profile/person/2004589
Vivo	Eduardo Navarro de Carvalho	Strategy	Strategy	https://www.linkedin.com/in/eduardonc/?originalSubdomain=es
AGCO	Luís Felli	Operações	Operations	https://www.agco.com.br/about/executive-leadership/luis-felli.html#:~:text=LU%C3%8DS%20FELLI,- https://www.linkedin.com/in/luis-felli-b8083544/?originalSubdomain=brVICE%2DPRESIDENTE%20S%C3%8ANIOR&text=Ingressando%20na%20AGCO%20em%202018,Jundia%C3%AD%2C%20S%C3%A3o%20Paulo%2C%20Brasil.
MAN	Roberto Cortes	Financeiro	Financial	https://www.linkedin.com/in/roberto-cortes-934169/ https://www.uol.com.br/carros/reportagens-especiais/entrevista-com-roberto-cortes/

Groupe PSA	Ana Theresa Borsari	Marketing	Commercial	https://www.linkedin.com/in/ana-borsari/?originalSubdomain=br https://carros.peugeot.com.br/sobre-a-peugeot/conheca-nossa-country-manager.html
Tigre	Otto von Sothen	Comercial	Commercial	https://www.linkedin.com/in/otto-von-sothen-162b844/?originalSubdomain=br
Americas Serviços Médicos	Claudio Lottenberg	Médico	Health Sector	https://www.linkedin.com/in/clottenberg/?originalSubdomain=br
Visa	Fernando Teles	Financial	Financial	https://www.linkedin.com/in/fernando-teles-45064a20/?originalSubdomain=br
Hermes Pardini	Roberto Santoro	Health	Health Sector	https://www.linkedin.com/in/roberto-santoro-91132037/
Ericsson	Eduardo Ricotta	Assorted	Assorted	https://www.linkedin.com/in/eduardo-ricotta/?originalSubdomain=br
HP	Claudio Raupp	Vendas	Commercial	https://www.linkedin.com/in/claudio-raupp-fonseca-224317/?originalSubdomain=br http://www.cmpa.eb.mil.br/ultimas-noticias/902-claudio-raupp-fonseca-ceo-da-hp-brasil-aa-cmpa-1980-conta-qual-e-o-papel-de-um-dirigente-em-uma-companhia-de-tecnologia
Algar Telecom	Jean Carlos Borges	Financeiro	Financial	https://ri.algartelecom.com.br/faq/diretoria/
Ambev	Bernardo Pinto Paiva	Operações	Operations	https://forbes.com.br/listas/2015/06/10-melhores-ceos-do-brasil-em-2015/
TIM	Stefano de Angelis	Strategy	Strategy	https://exame.com/negocios/tim-deve-nomear-gerente-de-angelis-como-ceo-diz-font/
John Deere	Paulo Herrmann	Marketing e vendas	Commercial	https://www.linkedin.com/in/paulo-herrmann-b89366a/?originalSubdomain=br
Libbs	Alcebíades de Mendonça Athayde Júnior	Family business	Familly business	https://www.libbs.com.br/timeline/2013-sr-athayde/
Atento	Mário Câmara	Financial	Financial	https://www.linkedin.com/in/macamara/?originalSubdomain=br

Duas Rodas	Leonardo Fausto Zipf	Comercial	Commercial	https://www.nsctotal.com.br/colunistas/estela-benetti/videos-mostram-as-trajetorias-dos-industriais-homenageados-pela-fiesc
GE	Daurio Speranzini Jr	Sales	Commercial	https://www.linkedin.com/in/daurio-speranzini-jr-a87a4517/?originalSubdomain=br
InterCement	Paulo Nigro	Operações	Operations	https://www.linkedin.com/in/paulo-nigro/?originalSubdomain=br
Adama	Rodrigo Gutierrez	Operações	Operations	https://www.linkedin.com/in/rodrigogutierrezbrazil/?originalSubdomain=br
Roche	Patrick Eckert	Marketing & Sales	Commercial	https://www.linkedin.com/in/patrick-eckert-3403b66/?originalSubdomain=br
L'Oreal	An Verhulst	Produtos	Innovation	https://www.linkedin.com/in/an-verhulst-santos-2525a58a/
VW-Volkswagen	Pablo Di Si	Finanças	Financial	https://www.vwnews.com.br/company/5/5
Claro	Jose Felix	Operations	Operations	https://www.linkedin.com/in/jos%C3%A9-f%C3%A9lix-416630/?originalSubdomain=br
Thyssenkrupp	Marcelo Nery	Operations	Operations	https://www.linkedin.com/in/marcelo-nery-b478b855/?originalSubdomain=br
Alelo	Cesario Nakamura	Produto, marketing	Innovation	https://www.linkedin.com/in/cesario-nakamura/?originalSubdomain=br
B2W	Anna Christina Ramos Saicali	Tecnologia e RH	Innovation	https://www.linkedin.com/in/anna-saicali-473b893b/ https://economia.estadao.com.br/fatos-relevantes/pdf/27249206.pdf
Duratex	Antonio Joaquim de Oliveira	Suprimentos	Operations	https://www.linkedin.com/in/antonio-joaquim-de-oliveira/?originalSubdomain=br
MRV Engenharia	Rafael Menin e Eduardo Fisher	Family business	Familly business	https://www.mrv.com.br/institucional/pt/relacionamentos/noticias/para-a-mrv-maior-construtora-do-pais-o-lema-e-se-nao-comprar-alugue

Tecnisa	Joseph Meyer Nigri	Family business	Familly business	https://www.linkedin.com/in/josephnigri/?originalSubdomain=br
AngloGold Ashanti	Camilo Farace	Founder	Entrepreneur	https://www.sunoresearch.com.br/tudo-sobre/meyer-joseph-nigri/
Cisco	Laércio Albuquerque	Vendas	Commercial	https://www.linkedin.com/in/laercioabq/?originalSubdomain=br
Eletropaulo	Charles Lenzi	Engenharia, operações, vendas, financeiro	Innovation	https://www.linkedin.com/in/charles-lenzi-3544381/
FMC Agricultural Solutions	Ronaldo Pereira	Comercial	Commercial	https://www.fmcagricola.com.br/Home/DetalhesRelease/635
EMS	Carlos Sanchez	Family business	Familly business	https://www.sunoresearch.com.br/tudo-sobre/carlos-sanchez/
Liberty Seguros	Carlos Magnarelli	Financeiro	Financial	https://www.linkedin.com/in/carlos-magnarelli-088b9a2/?originalSubdomain=br
Mercado Livre	Stelleo Tolda	Co-founder	Entrepreneur	https://www.linkedin.com/in/stelleotolda/
Oi	Eurico Teles	Jurídico	Legal affairs	https://www.linkedin.com/in/eurico-teles/?originalSubdomain=br
Coca-Cola Brasil	Henrique Braun	Inovação, cadeia de suprimentos, desenvolvimento de novos negócios, marketing, gerência geral, operações de engarrafamento	Innovation	https://www.linkedin.com/in/henrique-braun-a6212264/?originalSubdomain=br https://liderancacomvalores.com.br/lideres/henrique-braun/#:~:text=Henrique%20Braun%20%C3%A9%20CEO%20da,Norte%2C%20Europa%20e%20Am%C3%A9rica%20Latina.
Volvo	Luis Rezende	Financial	Financial	https://valoragregado.com/2014/01/27/volvo-cars-do-brasil-tem-novo-presidente/
Edenred	Gilles Coccoli	Estratégia	Strategy	https://www.linkedin.com/in/gillescoccoli/?originalSubdomain=br
CPFL Energia	Andre Dorf	Estratégia	Strategy	https://www.linkedin.com/in/andre-dorf-294227174/

Aker Solutions	Maria Peralta	Production	Operations	https://www.linkedin.com/in/maria-peralta-b4119964/
São Martinho	Fabio Venturelli	Estratégia	Strategy	https://www.bloomberg.com/profile/person/16173890 https://ri.ctc.com.br/pt/gestao
Bayer	Theo van der Loo	Marketing	Commercial	https://www.linkedin.com/in/theovanderloo/?originalSubdomain=br
EDP	Miguel Setas	Marketing	Commercial	https://www.linkedin.com/in/miguel-setas-18579318/ https://www.edp.com.br/noticias/miguel-setas-presidente-da-edp-no-brasil-recebe-medalha-ordem-do-ipiranga#:~:text=Miguel%20Setas%2C%20presidente%20da%20EDP,recebe%20medalha%20Ordem%20do%20Ipiranga
Saint-Gobain	Thierry Fournier	Produto	Innovation	https://www.linkedin.com/in/thierry-fournier-958a9533/?originalSubdomain=br https://www.bloomberg.com/profile/person/18655197
Eurofarma	Maurízio Billi	Empresa familiar	Familly business	https://www.sunoresearch.com.br/tudo-sobre/maurizio-billi/
Cargill	Luiz Pretti	Financeiro	Financial	https://www.linkedin.com/in/luiz-pretti-317594155/?originalSubdomain=br
Concremat	Mauro Viegas Filho	Empresa familiar	Familly business	https://www.linkedin.com/in/mauro-ribeiro-viegas-filho-aa236a9/?originalSubdomain=br
Lorenzetti	Eduardo Coli	Consultoria	Consultancy	https://books.google.com.br/books?id=Saf9twd7Ay8C&pg=PA43&lpg=PA43&dq=%22eduardo+coli%22+carreira&source=bl&ots=ycZFnxgEZL&sig=ACfU3U2QJkfe0LZ_thc5igDOB3pswweqhw&hl=pt-BR&sa=X&ved=2ahUKEwit-tKZysHsAhVcHrkGHfYyDM04ChDoATAGegQIBRAC#v=onepage&q=%22eduardo%20coli%22%20carreira&f=false

BRF	Sidney Manzaro	Operações	Operations	https://www.linkedin.com/in/sidney-manzaro-954895/?originalSubdomain=br
Electrolux	Ricardo Cons	Vendas	Commercial	https://www.linkedin.com/in/ricardo-cons-25269710/
Anima Educação	Daniel Castanho	Fundador	Entrepreneur	https://www.linkedin.com/in/daniel-castanho/ https://ri.animaeducacao.com.br/show.aspx?idCanal=5mRQIIrXsbYIp6k5iywtng==
Ingredion	Ernesto Pousada	Operations	Operations	https://www.linkedin.com/in/ernesto-pousada-7828a9135/
Energisa	Flávio Luiz Marqueti	Comercial	Commercial	https://www.linkedin.com/in/flaviomarqueti/
Enel	Carlo Zorzoli	Project, engineer, sales, operations	Innovation	https://www.linkedin.com/in/carlozorzoli/
Janssen	Bruno Costa Gabriel	Vendas e marketing	Commercial	https://www.linkedin.com/in/bruno-costa-gabriel-22891014/
Coopercitrus	José Vicente da Silva	Financial	Financial	http://coopercitrus.com.br/index.php?pag=revista&p=materia&codigo=5580
Positivo	Helio Bruck Rotenberg	Fundador	Entrepreneur	https://www.bloomberg.com/profile/person/15342060 https://www.mundopositivo.com.br/carreira-educacao/positivo-30-anos-entrevista-exclusiva-com-helio-bruck-rotenberg/
Linde Gases	Scott Latta	Assorted	Assorted	https://www.linkedin.com/in/scott-latta-701a7b10/?originalSubdomain=br
Shell	Andre Lopes Araujo	Comercial	Commercial	https://www.linkedin.com/in/andre-lopes-araujo-1706b29/?originalSubdomain=br
JBS	Wesley Mendonca Batista Filho	Family business	Familly business	https://www.bloomberg.com/profile/person/18300583 https://valor.globo.com/agronegocios/noticia/2020/01/09/a-ascensao-do-jovem-wesley-batista-filho-ao-comando-da-seara.ghtml

Santander	Sérgio Rial	Financeiro	Financial	https://www.linkedin.com/in/sergio-rial-12611951/?originalSubdomain=br
Sodexo	Andréia Dutra	Human resource	Human resource	https://www.linkedin.com/in/andreiadutra/
Aegea Saneamento	Hamilton Amadeo	Public sector	Public sector	https://www.linkedin.com/in/hamiltonamadeo/?originalSubdomain=br
Engie	Eduardo Antonio Gori Sattamini	Financeiro	Financial	https://www.bloomberg.com/profile/person/16648085
Localiza	Eugenio Pacelli Mattar	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3986664
União Química	Fernando de Castro Marques	Family business	Familly business	https://www.uniaoquimica.com.br/novidades/uniao-e-nossa-quimica/#:~:text=%C3%8Dcone%20entre%20os%20propagandistas%20da,filhos%2C%20Fernando%20de%20Castro%20Marques.

2019

Company	CEO	Background	Classification 2019	Source
Embraer	Francisco Gomes Neto	Engenharia, assistência técnica e comercial	Innovation	https://www.linkedin.com/in/francisco-gomes-neto-514a0414/?originalSubdomain=br https://ri.embraer.com.br/governanca/estrutura-organizacional/
Natura	João Paulo Ferreira	Operações	Operations	https://www.linkedin.com/in/jo%C3%A3o-paulo-ferreira-b92245/
Whirlpool	João Carlos Brega	Financeiro	Financial	https://www.linkedin.com/in/joao-carlos-brega/?originalSubdomain=br
Einstein	Sidney Klajner	Health	Health Sector	https://www.linkedin.com/in/sidney-klajner-b3b50043/?originalSubdomain=br
WEG	Harry Schmelzer Jr	Vendas	Commercial	https://ri.weg.net/governanca-corporativa/diretoria-executiva/
Petrobrás	Roberto Castello Branco	Financeiro	Financial	https://www.sunoresearch.com.br/tudo-sobre/roberto-castello-branco/
Bradesco	Octavio de Lazari Junior	Assorted	Assorted	https://www.sunoresearch.com.br/tudo-sobre/octavio-de-lazari/
Cielo	Paulo Rogerio Caffarelli	Vendas	Commercial	https://www.bloomberg.com/profile/person/7429811
CNH Industrial	Vilmar Fistarol	Compras	Operations	https://www.linkedin.com/in/vilmar-fistarol-0b3102a5/
Grupo Boticário	Artur Grynbaum	Comercial	Commercial	https://www.linkedin.com/in/artur-grynbaum-0b113b1a6/
Robert Bosch Ltda.	Besaliel Botelho	Engenharia e desenvolvimento de produto e vendas técnicas	Innovation	https://www.linkedin.com/in/besaliel-botelho-31094065/?originalSubdomain=br https://www.automotivebusiness.com.br/noticia/29862/besaliel-botelho-assume-presidencia-da-aea
Nidec Global Appliance	Not found	Assorted	Assorted	-
Itaú Unibanco	Candido Botelho Bracher	Financeiro	Financial	https://www.linkedin.com/in/candido-bracher/?originalSubdomain=br

Aché	Vânia Nogueira de Alcantara Machado	Comercial	Commercial	https://www.linkedin.com/in/v%C3%A2nia-nogueira-alcantara-machado-63731611/?originalSubdomain=br
3M	Mark Copman	Operations	Operations	https://www.linkedin.com/in/mark-copman-07646/?originalSubdomain=br
IBM	Tonny Martins	Financeiro	Financial	https://www.linkedin.com/in/tonnymartins/?originalSubdomain=br
Solvay	Daniela Manique	Compras	Operations	https://www.linkedin.com/in/danielamanique/
L'Oreal	An Verhulst	Produtos	Innovation	https://www.linkedin.com/in/an-verhulst-santos-2525a58a/
Mahle	Sergio Pancini de Sá	Engineering	Innovation	https://ri.mahle.com.br/governanca-corporativa/conselhos-e-diretoria/
ENER Brasil	Jens Raffelsieper	Founder	Entrepreneur	https://diariodonordeste.verdesmares.com.br/negocios/zpe-ceara-tera-industria-de-paineis-fotovoltaicos-1.1907873?page=5 https://www.linkedin.com/in/jens-raffelsieper-9584ab19/?originalSubdomain=br
Amil	José Carlos Magalhães	Health	Health Sector	https://www.linkedin.com/in/jos%C3%A9-carlos-magalh%C3%A3es-aa99aa22/?originalSubdomain=br
Rhodia	José Carlos Grubisich	Marketing, comercial	Commercial	https://www.linkedin.com/in/jose-carlos-grubisich-10647b16/?originalSubdomain=br https://www.dgabc.com.br/Noticia/275871/rhodia-vai-ter-novo-comando-no-brasil
Braskem	Fernando Musa	Planejamento estratégico	Commercial	https://www.linkedin.com/in/fernando-musa-505133/
Tigre	Otto von Sothen	Comercial	Commercial	https://www.linkedin.com/in/otto-von-sothen-162b844/?originalSubdomain=br
John Deere	Paulo Herrmann	Marketing e vendas	Commercial	https://www.linkedin.com/in/paulo-herrmann-b89366a/?originalSubdomain=br

Nestlé	Marcelo Melchior	Estratégia	Strategy	https://www.linkedin.com/in/marcelomelchior/?originalSubdomain=br
BASF	Manfredo Rübens	Financeiro	Financial	https://www.linkedin.com/in/manfredo-r%C3%BCbens-84903b172/?originalSubdomain=br
Visa	Fernando Teles	Financeiro	Financial	https://www.linkedin.com/in/fernando-teles-45064a20/?originalSubdomain=br
ADAMA	Rodrigo Gutierrez	Operações	Operations	https://www.linkedin.com/in/rodrigogutierrezbrazil/?originalSubdomain=br
Algar Telecom	Jean Carlos Borges	Financeiro	Financial	https://ri.algartelecom.com.br/faq/diretoria/
Microsoft Brasil	Tania Cosentino	Financeiro	Financial	https://www.linkedin.com/in/tania-cosentino-18bb236/?originalSubdomain=br
Nexa Resources	Tito Martins	Financeiro	Financial	https://www.nexaresources.com/pt/about-profile#1/Tito-Martins
Duratex	Antonio Joaquim de Oliveira	Suprimentos	Operations	https://www.linkedin.com/in/antonio-joaquim-de-oliveira/?originalSubdomain=br
Schneider Electric	Marcos Matias	Equipments, Project & Service	Innovation	https://www.linkedin.com/in/marcos-matias/?originalSubdomain=br https://epocanegocios.globo.com/Empresa/noticia/2019/05/de-estagiario-ceo-o-brasileiro-frente-da-multinacional-francesa-schneider-electric-no-brasil.html
BRK Ambiental Participações S.A	Teresa Vernaglia	Engenharia, operações, comercial, estratégia	Innovation	https://www.linkedin.com/in/teresa-vernaglia-385272/?originalSubdomain=br
Cristália	Eduardo Job	Administração Hospitalar	Health Sector	https://www.linkedin.com/in/eduardo-job-35a72611/?originalSubdomain=br https://eurofarma.com.br/governanca-corporativa
Embraco	Not found	Assorted	Assorted	-
Eurofarma	Maurízio Billi	Empresa familiar	Familly business	https://www.sunoresearch.com.br/tudo-sobre/maurizio-billi/

AGCO	Luís Felli	Operações	Operations	https://www.agco.com.br/about/executive-leadership/luis-felli.html#:~:text=LU%C3%8DS%20FELLI,-VICE%2DPRESIDENTE%20S%C3%8ANIOR&text=Ingressando%20na%20AGCO%20em%202018,Jundia%C3%AD%2C%20S%C3%A3o%20Paulo%2C%20Brasil.
Stefanini	Marco Stefanini	Fundador	Entrepreneur	https://www.linkedin.com/in/stefaninimarco/?originalSubdomain=br
EDP	Miguel Setas	Marketing	Commercial	https://www.linkedin.com/in/miguel-setas-18579318/
Cogna Educação	Rodrigo Calvo Galindo	Operações	Operations	https://www.linkedin.com/in/rodrigo-galindo-728411102/?originalSubdomain=br
Andrade Gutierrez	Renato Torres de Faria	Financeiro	Financial	https://www.bloomberg.com/profile/person/15875528
Movida	Renato Horta Franklin	Compras	Operations	https://www.linkedin.com/in/renato-franklin-806a1114/?originalSubdomain=br
Thyssenkrupp	Marcelo Nery	Operations	Operations	https://www.linkedin.com/in/marcelo-nery-b478b855/?originalSubdomain=br
Mercado Livre	Stelleo Tolda	Co-founder	Entrepreneur	https://www.linkedin.com/in/stelleotolda/
Santander	Sérgio Rial	Financeiro	Financial	https://www.linkedin.com/in/sergio-rial-12611951/?originalSubdomain=br
Enel	Carlo Zorzoli	Project, engineer, sales, operations	Innovation	https://www.linkedin.com/in/carlozorzoli/
Sanofi	Felix Scott	Financeiro	Financial	https://www.sanofi.com.br/-/media/Project/One-Sanofi-Web/Websites/Latin-America/Sanofi-BR/Home/pt/Imprensa/Releases/2019-01-17-diretor.pdf https://www.linkedin.com/in/felix-scott-54ba5a2b/?originalSubdomain=br

Localiza	Eugenio Pacelli Mattar	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3986664
Novartis	Renato Carvalho	Project Manager, operations, Strategy , Sales, Finance and Pricing	Innovation	https://www.linkedin.com/in/renato-garcia-carvalho-b786498/?originalSubdomain=br
Pernambucanas	Sergio Borriello	Financeiro	Financial	https://www.linkedin.com/in/sergio-borriello-615314/?originalSubdomain=br
Ambev	Bernardo Pinto Paiva	Operações	Operations	https://forbes.com.br/listas/2015/06/10-melhores-ceos-do-brasil-em-2015/
Electrolux	Ricardo Cons	Vendas	Commercial	https://www.linkedin.com/in/ricardo-cons-25269710/
Hermes Pardini	Roberto Santoro	Health	Health Sector	https://www.linkedin.com/in/roberto-santoro-91132037/
MRV Engenharia	Rafael Menin e Eduardo Fisher	Family business	Familly business	https://www.mrv.com.br/institucional/pt/relacionamentos/noticias/para-a-mrv-maior-construtora-do-pais-o-lema-e-se-nao-comprar-alugue
Fleury	Carlos Alberto Iwata Marinelli	Inovação	Innovation	https://www.bloomberg.com/profile/person/18884059
Coca-Cola Brasil	Henrique Braun	Inovação, cadeia de suprimentos, desenvolvimento de novos negócios, marketing, gerência geral, operações de engarrafamento	Innovation	https://www.linkedin.com/in/henrique-braun-a6212264/?originalSubdomain=br
Aegea Saneamento	Hamilton Amadeo	Public sector	Public Sector	https://www.linkedin.com/in/hamiltonamadeo/?originalSubdomain=br https://northstone.com.br/pt/team/hamilton-amadeo/
Ingredion	Ernesto Pousada	Operations	Operations	https://www.linkedin.com/in/ernesto-pousada-7828a9135/

P&G Brasil	Juliana Azevedo	Operações	Operations	https://www.linkedin.com/in/azevedojuliana/?originalSubdomain=br
VLI Logística	Ernesto Pousada	Project, operations, Commercial	Operations	https://www.linkedin.com/in/ernesto-pousada-7828a9135/?originalSubdomain=br
Samsung	Yoonie Joung	P&D, vendas	Innovation	https://propmark.com.br/anunciantes/novo-presidente-da-samsung-brasil-faz-sua-primeira-aparicao-no-pais/#:~:text=No%20pa%C3%ADs%2C%20o%20novo%20presidente,tecnologia%20para%20inspirar%20os%20consumidores. https://www.linkedin.com/in/yoonie-joung-%EC%A0%95%EC%9C%A4-69646017/?originalSubdomain=br
EMS	Carlos Sanchez	Family business	Familly business	https://www.sunoresearch.com.br/tudo-sobre/carlos-sanchez/
Americas Serv. Médicos	José Carlos Magalhães	Health	Health Sector	https://www.linkedin.com/in/jos%C3%A9-carlos-magalh%C3%A3es-aa99aa22/?originalSubdomain=br
Claro	Jose Felix	Operações	Operations	https://www.linkedin.com/in/jos%C3%A9-f%C3%A9lix-416630/?originalSubdomain=br
Gerdau	Gustavo Werneck	Engineering	Innovation	https://www.linkedin.com/in/gustavowerneck/?originalSubdomain=br
Bayer	Marc Reichardt	Product, sales, operations	Innovation	https://www.linkedin.com/in/marc-reichardt-6b91108/?locale=pt_BR https://www.jornaldocomercio.com/_conteudo/economia/2018/06/635562-bayer-confirma-marc-reichardt-como-novo-presidente-da-empresa-no-brasil.html
São Martinho	Fabio Venturelli	Estratégia	Strategy	https://www.bloomberg.com/profile/person/16173890
TOTVS	Dennis Herszkowicz	Financeiro	Financial	https://www.linkedin.com/in/dennis-h-3696ba1/?originalSubdomain=br

HP	Claudio Raupp	Vendas	Commercial	https://www.linkedin.com/in/claudio-raupp-fonseca-224317/?originalSubdomain=br
Cargill Nutrição Animal (Nutron)	Celso Mello	Vendas	Commercial	https://www.linkedin.com/in/celso-mello-6264bb6/?originalSubdomain=br
Vivo	Christian Gebara	Operations	Operations	https://www.linkedin.com/in/christian-gebara-203227/?originalSubdomain=br
Oxiteno	Frederico Curado	Financeiro	Financial	https://www.bloomberg.com/profile/person/2004589
Cisco	Laércio Albuquerque	Vendas	Commercial	https://www.linkedin.com/in/laercioabq/?originalSubdomain=br
Alelo	Cesario Nakamura	Produto, marketing	Innovation	https://www.linkedin.com/in/cesario-nakamura/?originalSubdomain=br
Aker Solutions	Maria Peralta	Production	Operations	https://www.linkedin.com/in/maria-peralta-b4119964/
Concremat	Mauro Viegas Filho	Empresa familiar	Familly business	https://www.linkedin.com/in/mauro-ribeiro-viegas-filho-aa236a9/?originalSubdomain=br
Peugeot Citroën do Brasil Automóveis	Ana Theresa Borsari	Marketing	Commercial	https://www.linkedin.com/in/ana-borsari/?originalSubdomain=br
BRF	Pedro Parente	Setor público	Public Sector	https://www.linkedin.com/in/pedro-parente-0283b5a4/
Intercement	Flavio Aidar	Assorted	Assorted	https://www.linkedin.com/in/flavio-aidar-7ab624aa/?originalSubdomain=br
Copel	Daniel Pimentel Slaviero	Public sector, comunicação	Public Sector	https://www.copel.com/hpcweb/institucional/diretoria-da-holding/
Edenred	Gilles Coccoli	Estratégia	Strategy	https://www.linkedin.com/in/gillescoccoli/?originalSubdomain=br
Votorantim Cimentos	Marcelo Castelli	Estratégia	Strategy	https://www.linkedin.com/in/marcelo-castelli-1b635431/?originalSubdomain=br

				https://www.sunoresearch.com.br/tudo-sobre/marcelo-castelli/
Netshoes	Marcio Kumruian	Fundador	Entrepreneur	https://www.linkedin.com/in/marciokumruian/?originalSubdomain=br
Volkswagen Caminhões e Ônibus	Antonio Roberto Cortes	Fincanceiro	Financial	https://www.linkedin.com/in/antonio-roberto-cortes-1ba045180/?originalSubdomain=br https://www.uol.com.br/carros/reportagens-especiais/entrevista-com-roberto-cortes/#end-card
Saint-Gobain	Thierry Fournier	Produto	Innovation	https://www.linkedin.com/in/thierry-fournier-958a9533/?originalSubdomain=br
TIM	Pietro Labriola	Project, operations, marketing	Innovation	https://www.linkedin.com/in/pietro-labriola-2568b7b/?originalSubdomain=br
Duas Rodas	Leonardo Fausto Zipf	Comercial	Commercial	https://www.nsctotal.com.br/colunistas/estela-benetti/videos-mostram-as-trajetorias-dos-industriais-homenageados-pela-fiesc
Reckitt Benckiser	Paolo D'Orso	Vendas	Commercial	https://www.linkedin.com/in/paolo-d-orso-3377522/?originalSubdomain=br
Bemis	Carlos Alberto Olivera Santa Cruz	Vendas	Commercial	https://www.linkedin.com/in/carlosalbertooliverasantacruz/?locale=pt_BR
Messer Gases	Scott Latta	Assorted	Assorted	https://www.linkedin.com/in/scott-latta-701a7b10/?originalSubdomain=br
Klabin SA	Cristiano Cardoso Teixeira	Financeiro	Financial	https://www.linkedin.com/in/cristiano-c-teixeira-1a319a22/ https://www.bloomberg.com/profile/person/17567319
Sanepar	Claudio Stabile	Financeiro	Financial	https://www.linkedin.com/in/claudio-stabile-58967026/?originalSubdomain=br
Roche Farma Brasil	Patrick Eckert	Marketing	Commercial	https://www.linkedin.com/in/patrick-eckert-3403b66/?originalSubdomain=br

CPFL Energia	Gustavo Estrella	Financeiro	Financial	https://www.linkedin.com/in/gustavo-estrella-5a566217/?originalSubdomain=br
Invepar	Abel Alves Rochinha	Financeiro	Financial	https://www.linkedin.com/in/abel-rochinha-789400/
Ecorodovias	Luis Salvador	Engenharia	Innovation	https://www.linkedin.com/in/luis-salvador-94602177/
Sompo Seguros	Francisco Caiuby Vidigal Filho	Comercial	Commercial	https://www.linkedin.com/in/francisco-caiuby-vidigal-filho-7379b3129/?originalSubdomain=br
Lorenzetti S/A	Eduardo Coli	Consultoria	Consultancy	https://books.google.com.br/books?id=Saf9twd7Ay8C&pg=PA43&lpg=PA43&dq=%22eduardo+coli%22+carreira&source=bl&ots=ycZFnxgEZL&sig=ACfU3U2QJkfe0LZ_thc5igDOB3pswweqhw&hl=pt-BR&sa=X&ved=2ahUKEwit-tKZysHsAhVcHrkGHfYyDM04ChDoATAGegQIBRAC#v=onepage&q=%22eduardo%20coli%22%20carreira&f=false

2020

Company	CEO	Background	Classification 2020	Source
Natura	João Paulo Ferreira	Operações	Operations	https://www.linkedin.com/in/jo%C3%A3o-paulo-ferreira-b92245/
Einstein	Sidney Klajner	Health	Health Sector	https://www.linkedin.com/in/sidney-klajner-b3b50043/?originalSubdomain=br
Embraer	Francisco Gomes Neto	Innovation	Innovation	https://www.linkedin.com/in/francisco-gomes-neto-514a0414/?originalSubdomain=br https://ri.embraer.com.br/show.aspx?idCanal=aP/kOwXXSsdAYdpob5Ibsg==
Petrobrás	Roberto Castello Branco	Financeiro	Financial	https://www.sunoresearch.com.br/tudo-sobre/roberto-castello-branco/
Robert Bosch Ltda.	Besaliel Botelho	Engenharia e desenvolvimento de produto e vendas técnicas	Innovation	https://www.linkedin.com/in/besaliel-botelho-31094065/?originalSubdomain=br
Cielo	Paulo Rogerio Caffarelli	Vendas	Commercial	https://www.bloomberg.com/profile/person/7429811
Whirlpool	João Carlos Brega	Financeiro	Financial	https://www.linkedin.com/in/joao-carlos-brega/?originalSubdomain=br
WEG	Harry Schmelzer Jr	Vendas	Commercial	https://ri.weg.net/governanca-corporativa/diretoria-executiva/
Bradesco	Octavio de Lazari Junior	Assorted	Assorted	https://www.sunoresearch.com.br/tudo-sobre/octavio-de-lazari/
CNH Industrial	Vilmar Fistarol	Compras	Operations	https://www.linkedin.com/in/vilmar-fistarol-0b3102a5/
Grupo Boticário	Artur Grynbaum	Comercial	Commercial	https://www.linkedin.com/in/artur-grynbaum-0b113b1a6/
Aché	Vânia Nogueira de Alcantara Machado	Comercial	Commercial	https://www.linkedin.com/in/v%C3%A2nia-nogueira-alcantara-machado-63731611/?originalSubdomain=br

3M	Marcelo Oromendia	Estratégia	Strategy	https://www.linkedin.com/in/marcelo-oromendia-a68117/
Nestlé	Marcelo Melchior	Estratégia	Strategy	https://www.linkedin.com/in/marcelomelchior/?originalSubdomain=br
Ambev	Jean Jereissati Neto	Marketing	Commercial	https://www.linkedin.com/in/jeanjereissati/?originalSubdomain=br https://www.sunoresearch.com.br/tudo-sobre/jean-jereissati-neto/
IBM	Tonny Martins	Financeiro	Financial	https://www.linkedin.com/in/tonnymartins/?originalSubdomain=br
BASF	Manfredo Rübens	Financeiro	Financial	https://www.linkedin.com/in/manfredo-r%C3%BCbens-84903b172/?originalSubdomain=br
Saint-Gobain	Thierry Fournier	Produto	Innovation	https://www.linkedin.com/in/thierry-fournier-958a9533/?originalSubdomain=br
John Deere	Paulo Herrmann	Marketing e vendas	Commercial	https://www.linkedin.com/in/paulo-herrmann-b89366a/?originalSubdomain=br
Microsoft Brasil	Tania Cosentino	Financeiro	Financial	https://www.linkedin.com/in/tania-cosentino-18bb236/?originalSubdomain=br
EDP	Miguel Setas	Marketing	Commercial	https://www.linkedin.com/in/miguel-setas-18579318/
Stefanini	Marco Stefanini	Fundador	Entrepreneur	https://www.linkedin.com/in/stefaninimarco/?originalSubdomain=br
Vivo	Christian Gebara	Operations	Operations	https://www.linkedin.com/in/christian-gebara-203227/?originalSubdomain=br
Klabin SA	Cristiano Cardoso Teixeira	Financeiro	Financial	https://www.linkedin.com/in/cristiano-c-teixeira-1a319a22/
Itaú Unibanco	Candido Botelho Bracher	Financeiro	Financial	https://www.linkedin.com/in/candido-bracher/?originalSubdomain=br
Cogna Educação	Rodrigo Calvo Galindo	Operações	Operations	https://www.linkedin.com/in/rodrigo-galindo-728411102/?originalSubdomain=br
Algar Telecom	Jean Carlos Borges	Financeiro	Financial	https://ri.algartelecom.com.br/faq/diretoria/

Visa	Fernando Teles	Financeiro	Financial	https://www.linkedin.com/in/fernando-teles-45064a20/?originalSubdomain=br
ENER Brasil	Jens Raffelsieper	Founder	Entrepreneur	https://diariodonordeste.verdesmares.com.br/negocios/zpe-ceara-tera-industria-de-paineis-fotovoltaicos-1.1907873?page=5
Magazine Luiza	Frederico Trajano Inácio Rodrigues	Empresa familiar	Familly business	https://www.sunoresearch.com.br/tudo-sobre/frederico-trajano/
Vale	Eduardo Bartolomeo	Operações	Operations	https://www.linkedin.com/in/eduardobartolomeo/?originalSubdomain=br
VLI Logística	Ernesto Pousada	Project, operations, Commercial	Operations	https://www.linkedin.com/in/ernesto-pousada-7828a9135/
SulAmérica	Gabriel Portella Fagundes Filho	Commercial	Commercial	https://portal.sulamericaseguros.com.br/institucional/noticias-sulamerica/gabriel-portella-assume-comando-da-sulamerica.htm https://www.bloomberg.com/profile/person/18012687
Mercado Livre	Stelleo Tolda	Co-founder	Entrepreneur	https://www.linkedin.com/in/stelleotolda/
AGCO	Luís Felli	Operações	Operations	https://www.agco.com.br/about/executive-leadership/luis-felli.html#:~:text=LU%C3%8DS%20FELLI,-VICE%2DPRESIDENTE%20S%C3%8ANIOR&text=Ingressando%20na%20AGCO%20em%202018,Jundia%C3%AD%2C%20S%C3%A3o%20Paulo%2C%20Brasil.
Duratex	Antonio Joaquim de Oliveira	Suprimentos	Operations	https://www.linkedin.com/in/antonio-joaquim-de-oliveira/?originalSubdomain=br
MRV Engenharia	Rafael Menin e Eduardo Fisher	Family business	Familly business	https://www.mrv.com.br/institucional/pt/relacionamentos/noticias/para-a-mrv-maior-construtora-do-pais-o-lema-e-se-nao-comprar-alugue
Fiat Chrysler Automobiles	Antonio Filosa	Strategic Planning, corporate PMO and Innovation, compras,	Innovation	https://www.linkedin.com/in/antoniofilosa/?originalSubdomain=br

		mkt, logística, operações		
Electrolux	Ricardo Cons	Vendas	Commercial	https://www.linkedin.com/in/ricardo-cons-25269710/
Ericsson	Eduardo Ricotta	Assorted	Assorted	https://www.linkedin.com/in/eduardo-ricotta/?originalSubdomain=br
Localiza	Eugenio Pacelli Mattar	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3986664
Eurofarma	Maurízio Billi	Empresa familiar	Familly business	https://www.sunoresearch.com.br/tudo-sobre/maurizio-billi/
Camargo Corrêa Infra	Marcelo Cordaro	Operation	Operations	https://www.linkedin.com/in/marcelo-cordaro-1b7329/?originalSubdomain=br
Cargill Nutrição Animal (Nutron)	Celso Mello	Vendas	Commercial	https://www.linkedin.com/in/celso-mello-6264bb6/?originalSubdomain=br
Santander	Sérgio Rial	Financeiro	Financial	https://www.linkedin.com/in/sergio-rial-12611951/?originalSubdomain=br
Hermes Pardini	Roberto Santoro	Health	Health Sector	https://www.linkedin.com/in/roberto-santoro-91132037/
TIM	Pietro Labriola	Project, operations, marketing	Innovation	https://www.linkedin.com/in/pietro-labriola-2568b7b/?originalSubdomain=br
Dasa	Carlos de Barros	Financeiro	Financial	https://www.linkedin.com/in/carlos-de-barros/?originalSubdomain=br
Banco Original	Alexandre Abreu	Financeiro	Financial	https://forbes.com.br/last/2018/10/alexandre-abreu-sera-presidente-do-banco-original/ http://g1.globo.com/economia/noticia/2015/02/fazenda-anuncia-alexandre-abreu-como-novo-presidente-do-bb.html
Volkswagen do Brasil	Pablo Di Si	Financeiro	Financial	https://www.vwnews.com.br/company/5/5
Tigre	Otto von Sothen	Comercial	Commercial	https://www.linkedin.com/in/otto-von-sothen-162b844/?originalSubdomain=br
Suzano	Walter Schalka	Assorted	Assorted	https://www.linkedin.com/in/walter-schalka-a3509b40/?originalSubdomain=br https://ir.suzano.com.br/Portuguese/governanca-corporativa/administracao/default.aspx

JBS	Wesley Mendonca Batista Filho	Empresa familiar	Familly business	https://www.bloomberg.com/profile/person/18300583 https://valor.globo.com/agronegocios/noticia/2020/01/09/a-ascensao-do-jovem-wesley-batista-filho-ao-comando-da-seara.ghtml
Schneider Electric	Marcos Matias	Equipments, Project & Service	Innovation	https://www.linkedin.com/in/marcos-matias/?originalSubdomain=br
Volkswagen Caminhões e Ônibus	Antonio Roberto Cortes	Fincanceiro	Financial	https://www.linkedin.com/in/antonio-roberto-cortes-1ba045180/?originalSubdomain=br
Siemens Brasil	Pablo Fava	Produto, mkt, vendas	Innovation	https://www.linkedin.com/in/pablo-roberto-fava-5010211/?locale=pt_BR
L'Oreal	An Verhulst	Produtos	Innovation	https://www.linkedin.com/in/an-verhulst-santos-2525a58a/
Fleury	Carlos Alberto Iwata Marinelli	Inovação	Innovation	https://www.bloomberg.com/profile/person/18884059
Nexa Resources	Tito Martins	Financeiro	Financial	https://www.nexaresources.com/pt/about-profile#1/Tito-Martins
STARA	Átila Stapelbroek Trennepohl	Empresa familiar	Familly business	https://diariodamanha.com/noticias/novo-presidente-da-stara-reforca-sequencia-do-carater-inovador-da-empresa/
Empresas Randon	Daniel Raul Randon	Empresa familiar	Familly business	https://www.randon.com.br/pt/noticias/daniel-randon-assume-presid%C3%AAncia-das-empresas-randon/
Algar Tech	Tatiane Panato	Financial	Financial	https://www.linkedin.com/in/tatiane-panato-5b866125/?originalSubdomain=br
Oi	Rodrigo Modesto de Abreu	Operations	Operations	https://www.oi.com.br/ri/conteudo_pt.asp?idioma=0&conta=28&tipo=43312 https://www.linkedin.com/in/rodrigo-m-abreu/?locale=pt_BR
ADAMA	Romeu Stanguerlin	Marketing	Commercial	https://www.linkedin.com/in/romeu-stanguerlin-66678b15/?originalSubdomain=br
Votorantim Cimentos	Marcelo Castelli	Estratégia	Strategy	https://www.linkedin.com/in/marcelo-castelli-1b635431/?originalSubdomain=br

Energisa	Ricardo Perez Botelho	Engenharia, tecnologia	Innovation	https://www.bloomberg.com/profile/person/2105867
Banco do Brasil	André Brandão	Assorted	Assorted	https://www.infomoney.com.br/mercados/andre-brandao-quem-e-o-novo-presidente-do-banco-do-brasil-e-o-que-esperar-dele-a-frente-da-instituicao/
AbbVie	Camilo Gomez	Marketing	Commercial	https://www.linkedin.com/in/camilo-gomez-3b8b5684/?originalSubdomain=br
Coca-Cola Brasil	Henrique Braun	Inovação, cadeia de suprimentos, desenvolvimento de novos negócios, marketing, gerência geral, operações de engarrafamento	Innovation	https://www.linkedin.com/in/henrique-braun-a6212264/?originalSubdomain=br
Alelo	Cesario Nakamura	Produto, marketing	Innovation	https://www.linkedin.com/in/cesario-nakamura/?originalSubdomain=br
Duas Rodas	Leonardo Fausto Zipf	Comercial	Commercial	https://www.nsctotal.com.br/colunistas/estela-benetti/videos-mostram-as-trajetorias-dos-industriais-homenageados-pela-fiesc
Concremat	Mauro Viegas Filho	Empresa familiar	Familly business	https://www.linkedin.com/in/mauro-ribeiro-viegas-filho-aa236a9/?originalSubdomain=br
Andrade Gutierrez	Renato Torres de Faria	Financeiro	Financial	https://www.bloomberg.com/profile/person/15875528
Bayer	Marc Reichardt	Product, sales, operations	Innovation	https://www.linkedin.com/in/marc-reichardt-6b91108/?locale=pt_BR
Oxiteno	Frederico Curado	Financeiro	Financial	https://www.bloomberg.com/profile/person/2004589
Liberty Seguros	Carlos Magnarelli	Financeiro	Financial	https://www.linkedin.com/in/carlos-magnarelli-088b9a2/?originalSubdomain=br
MAG Seguros	Helder Molina	Empresa familiar	Familly business	https://www.sonhoseguro.com.br/2016/10/quem-e-quem-helder-molina-ceo-da-mongeral-aegon/
Claro	Jose Felix	Operações	Operations	https://www.linkedin.com/in/jos%C3%A9-f%C3%A9lix-416630/?originalSubdomain=br

Sompo Seguros	Francisco Caiuby Vidigal Filho	Comercial	Commercial	https://www.linkedin.com/in/francisco-caiuby-vidigal-filho-7379b3129/?originalSubdomain=br
Cisco	Laércio Albuquerque	Vendas	Commercial	https://www.linkedin.com/in/laercioabq/?originalSubdomain=br
Mondelez International	Liel Miranda	Marketing	Commercial	https://www.linkedin.com/in/lielmiranda/?originalSubdomain=br
Novartis	Renato Carvalho	Project Manager, operations, Strategy , Sales, Finance and Pricing	Innovation	https://www.linkedin.com/in/renato-garcia-carvalho-b786498/?originalSubdomain=br
Braskem	Roberto Simões	Engenharia, operações	Innovation	https://www.linkedin.com/in/roberto-lopes-pontes-sim%C3%B5es-2368b8167/?originalSubdomain=br
EMS	Carlos Sanchez	Family business	Familly business	https://www.sunoresearch.com.br/tudo-sobre/carlos-sanchez/
CPFL Energia	Gustavo Estrella	Financeiro	Financial	https://www.linkedin.com/in/gustavo-estrella-5a566217/?originalSubdomain=br
Aker Solutions	Volmir Korzeniewski	Supply chain, quality	Operations	https://www.linkedin.com/in/volmir-korzeniewski-56a1425/?originalSubdomain=br
São Martinho	Fabio Venturelli	Estratégia	Strategy	https://www.bloomberg.com/profile/person/16173890
Rhodia	José Carlos Grubisich	Marketing, comercial	Commercial	https://www.linkedin.com/in/jose-carlos-grubisich-10647b16/?originalSubdomain=br
Thyssenkrupp	Marcelo Nery	Operations	Operations	https://www.linkedin.com/in/marcelo-nery-b478b855/?originalSubdomain=br
Gerdau	Gustavo Werneck	Engineering	Innovation	https://www.linkedin.com/in/gustavowerneck/?originalSubdomain=br
Amil	José Carlos Magalhães	Health	Health Sector	https://www.linkedin.com/in/jos%C3%A9-carlos-magalh%C3%A3es-aa99aa22/?originalSubdomain=br
Unimed-BH	Samuel Flam	Financeiro e Comercial	Financial	https://portal.unimedbh.com.br/wps/portal/corp/unimedbh/diretoriaconselhos#!/#main-container

Roche Farma Brasil	Patrick Eckert	Marketing	Commercial	https://www.linkedin.com/in/patrick-eckert-3403b66/?originalSubdomain=br
Pernambucanas	Sergio Borriello	Financeiro	Financial	https://www.linkedin.com/in/sergio-borriello-615314/?originalSubdomain=br
TOTVS	Dennis Herszkowicz	Financeiro	Financial	https://www.linkedin.com/in/dennis-h-3696ba1/?originalSubdomain=br
Edenred	Gilles Coccoli	Estratégia	Strategy	https://www.linkedin.com/in/gillescoccoli/?originalSubdomain=br
ArcelorMittal Brasil	Benjamin Baptista Filho	Commercial	Commercial	https://www.linkedin.com/in/benjamin-baptista-filho/?originalSubdomain=br
Somagrupo	Roberto Luiz Jatahy Gonçalves	Co-fundador	Entrepreneur	https://www.somagrupo.com.br/investidores/administracao/
BRK Ambiental Participações S.A	Teresa Vernaglia	Engenharia, operações, comercial, estratégia	Innovation	https://www.linkedin.com/in/teresa-vernaglia-385272/?originalSubdomain=br
Peugeot Citroën do Brasil Automóveis	Ana Theresa Borsari	Marketing	Commercial	https://www.linkedin.com/in/ana-borsari/?originalSubdomain=br

World

2016

Company	**CEO**	**Background**	**Classification 2016**	**Source**
Tesla	Elon Reeve Musk	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1954518
Salesforce.com	Marc Benioff	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1983575
Regeneron Pharmaceuticals	Leonard Schleifer	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1463677
Incyte	Hervé Hoppenot	Commercial	Commercial	https://www.linkedin.com/in/herve-hoppenot-4b912b9/
Alexion Pharmaceuticals	David Hallal	Operations	Operations	https://www.linkedin.com/in/david-hallal-15a407116/
Under Armour	Kevin A. Plank	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/7406856
Monster Beverage	Rodney Sacks	Founder	Entrepreneur	https://successstory.com/people/rodney-sacks
Unilever Indonesia	Maurits Daniel Rudolf Lalisang	Sales	Commercial	https://www.unilever.co.id/en/investor-relations/corporate-governance-manual/board-of-commissioners/profil.html
Vertex Pharmaceuticals	Jeffrey Leiden	Research, operations	Innovation	https://www.linkedin.com/in/jeffreyleiden/
BioMarin Pharmaceutical	Jean-Jacques Bienaimé	Marketing	Commercial	https://www.linkedin.com/in/jean-jacques-bienaime-04554a2/
Amazon.com	Jeffrey Bezos	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1642252
ARM Holdings	Simon Segars	Innovation	Innovation	https://www.linkedin.com/in/simon-segars-5562a02/
Naver	Sang-Hun Kim	Legal	Legal Affairs	https://www.linkedin.com/in/sang-hun-kim-872431100/
FleetCor Technologies	Ronald Clarke	Operations	Operations	https://www.bloomberg.com/profile/person/1488050
Netflix	Reed Hastings	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1971023
Shanghai RAAS Blood Products	Jie Chen	Assorted	Assorted	http://www.raas-corp.com/page.aspx?node=143&f=en

Rakuten	Hiroshi Mikitani	Founder	Entrepreneur	https://www.linkedin.com/in/mikitani/?originalSubdomain=jp
Asian Paints	K B S Anand	Marketing	Commercial	https://www.tatachemicals.com/about-us/Leadership-team/kbs-anand
LG Household & Health Care	Suk-Yong Cha	Financial	Financial	https://www.bloomberg.com/profile/person/2110927
Verisk Analytics	Scott Stephenson	Operations	Operations	https://www.bloomberg.com/profile/person/3480985
Amorepacific	Sang-Bae Shim	Family Business	Family Business	http://m.koreaherald.com/view.php?ud=20160711000974
Coloplast	Lars Rasmussen	Operations	Operations	https://www.linkedin.com/in/larserasmussen/
Marriott International	Arne Sorenson	Operations, finance	Operations	https://www.linkedin.com/in/arnesorenson/
Illumina	Francis deSouza	Product	Innovation	https://www.linkedin.com/in/francisdesouza/
Red Hat	James Whitehurst	Operations	Operations	https://www.linkedin.com/in/jiwhitehurst/
AmerisourceBergen	Steven Collis	Operations	Operations	https://www.bloomberg.com/profile/person/1903472
Visa	Charles Scharf	Financial	Financial	https://www.marketscreener.com/business-leaders/Charles-William-Scharf-4260/biography/
Sysmex	Hisashi Ietsugu	Assorted	Assorted	https://www.bloomberg.com/profile/person/3206697
Baidu	Robin Li	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/7374131
Mastercard	Ajay Banga	Operations	Operations	https://www.bloomberg.com/profile/person/4676567
Hindustan Unilever	Sanjiv Soshil Mehta	Commercial	Commercial	https://www.linkedin.com/in/sanjivmehtaunilever/?originalSubdomain=in
Hermès International	Henri-Louis Bauer	Assorted	Assorted	https://www.marketscreener.com/business-leaders/Henri-Louis-Bauer-2065/biography/
TransDigm Group	Nick Howley	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/4441160
Perrigo	John Hendrickson	Product development, Operations, supply chain	Operations	https://www.linkedin.com/in/john-hendrickson-3579451b/
The Priceline Group	Jeffery Boyd	Assorted	Assorted	https://www.linkedin.com/in/jeffery-boyd-901731a2/

Adobe Systems	Shantanu Narayen	Research	Innovation	https://www.bloomberg.com/profile/person/3332391 https://www.adobe.com/br/about-adobe/leaders/shantanu-narayen.html
Cerner	Neal Patterson	Founder	Entrepreneur	https://www.cerner.com/about/leadership/neal-patterson
Ulta Salon Cosmetcs & Fragrance	Mary Dillon	Marketing	Commercial	https://www.linkedin.com/in/mary-dillon-2382808/
Chipotle Mexican Grill	Steve Ells	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15002696
Almarai	Georges Schorderet	Operations, financial	Operations	https://www.bloomberg.com/profile/person/1507040
Fast Retailing	Tadashi Yanai	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3074722
Starbucks	Howard Schultz	Marketing	Commercial	https://www.sunoresearch.com.br/tudo-sobre/howard-schultz/
Unicharm	Takahisa Takahara	Family Business	Family Business	https://www.forbes.com/profile/takahisa-takahara/?sh=4a6383e8cdc1
Sirius XM Radio	James E Meyer	Product Management, Operations, sales, mkt	Innovation	https://www.bloomberg.com/profile/person/1512842
Iliad	Maxime Lombardini	Production	Operations	https://www.linkedin.com/in/maxime-lombardini-5bb93219a/
Magnit	Sergey Galitskiy	Founder	Entrepreneur	https://www.forbes.com/profile/sergei-galitsky/?sh=7e3edfb075cc
Autodesk	Amar Hanspal e Andrew Anagnost	Product, Strategy and Marketing	Innovation	https://www.linkedin.com/in/amarhanspal/ https://www.linkedin.com/in/andrewanagnost/
Tencent Holdings	Huateng Ma	Founder	Entrepreneur	https://www.linkedin.com/in/%E5%8C%96%E8%85%BE-%E9%A9%AC-41a43a114/
BesTV New Media	Jian Wang	Not found	Assorted	-
Lindt & Sprungli	Ernst Tanner	Management	Assorted	https://www.marketscreener.com/business-leaders/Ernst-Tanner-4528/biography/
Reckitt Benckiser Group	Rakesh Kapoor	Sales	Commercial	https://www.crunchbase.com/person/rakesh-kapoor

Cielo	Rômulo Dias	Not found	Assorted	-
Ctrip.com International	James Liang	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15134181
Mead Johnson Nutrition	Peter Jakobsen	Operations	Operations	https://www.bloomberg.com/profile/person/16353059
Shimano	Yozo Shimano	Family Business	Family Business	https://ciaobikeitaly.com/blog/history-of-shimano-the-presidents/
Kone	Henrik Ehrnrooth	Financial	Financial	https://www.linkedin.com/in/henrik-ehrnrooth-kone/?originalSubdomain=fi
Dassault Systemes	Bernard Charlès	R&D	Innovation	https://www.linkedin.com/in/dassaultsystemesceo/
Expedia	Dara Khosrowshahi	Financial	Financial	https://www.bloomberg.com/profile/person/2037795
ProSiebenSat1 Media	Thomas Ebeling	Assorted	Assorted	https://www.marketscreener.com/business-leaders/Thomas-Ebeling-05KXS3-E/biography/
Brown-Forman	Paul Varga	Marketing	Commercial	https://www.brown-forman.com/about/corporate-governance/profiles/paul-varga/
SBA Communications	Jeffrey Stoops	Financial	Financial	https://www.bloomberg.com/profile/person/1888834
Essilor International	Hubert Sagnières	Marketing	Commercial	https://peoplepill.com/people/hubert-sagnieres/
Allergan	Brenton Saunders	Compliance	Legal Affairs	https://www.linkedin.com/in/brentlsaunders/ https://www.bloomberg.com/profile/person/3907227
Keyence	Akinori Yamamoto	Assorted	Assorted	https://www.bloomberg.com/profile/person/16440602
Oriental Land	Toshio Kagami	Assorted	Assorted	https://www.bloomberg.com/profile/person/1812623
Tata Consultancy Services	Natarajan Chandrasekaran	Operations	Operations	https://www.bloomberg.com/profile/person/6996212
Intuitive Surgical	Gary Guthart	Product, engineering, operations	Innovation	https://www.bloomberg.com/profile/person/3429541
Fastenal	Daniel Florness	Financial	Financial	https://www.bloomberg.com/profile/person/1560300
Roper Industries	Brian Jellison	Infrastructure	Assorted	https://www.bloomberg.com/profile/person/1513524
Smith & Nephew	Olivier Bohuon	Commercial	Commercial	https://www.linkedin.com/in/olivier-bohuon-a044872/?originalSubdomain=uk

Experian	Brian Cassin	Financial	Financial	https://www.linkedin.com/in/briancassin/?originalSubdomain=uk
Colgate-Palmolive	Ian Cook	Operations	Operations	https://www.bloomberg.com/profile/person/1558387
Sun Pharma Industries	Dilip Shanghvi	Family Business	Family Business	https://www.forbes.com/profile/dilip-shanghvi/?sh=2383c84af812
Acuity Brands	Vernon J. Nagel	Financial	Financial	https://www.bloomberg.com/profile/person/1442718
Molson Coors Brewing	Mark Hunter	Commercial	Commercial	https://www.linkedin.com/in/mark-hunter-6490a194/
Fanuc	Yoshiharu Inaba	Family business	Family Business	https://asia.nikkei.com/Business/Companies/Robot-maker-Fanuc-s-CEO-steps-back-after-16-years-at-controls
Inditex	Pablo Álvarez De Tejera	Legal	Legal Affairs	https://www.bloomberg.com/profile/person/1438094 https://www.sunoresearch.com.br/tudo-sobre/pablo-isla/
Luxottica Group	Massimo Vian	Product, Operations, engineering, consultant	Innovation	https://www.linkedin.com/in/massimo-vian-b2a39410/?originalSubdomain=it
SABMiller	Alan Clark	Operations	Operations	https://www.bloomberg.com/profile/person/3575349
CR Bard	Timothy Ring	strategic planning and international operations	Strategy	https://www.crunchbase.com/person/timothy-m-ring
General Mills	Kendall Powell	Operations	Operations	https://www.crunchbase.com/person/kendall-j-powell
Novozymes	Peder Nielsen	R&D, mkt, sales, supply chain	Innovation	https://www.linkedin.com/in/pederholknielsen/
Edwards Lifesciences	Michael Mussallem	Engineering and Product Development	Innovation	https://www.bloomberg.com/profile/person/1835754 http://ir.edwards.com/board-directors-management/michael-mussallem/
Equifax	Richard Smith	Operations	Operations	https://www.bloomberg.com/profile/person/7403090
Geberit	Christian Buhl	Sales	Commercial	https://www.bloomberg.com/profile/person/19077225
Capita	Andy Parker	Operations	Operations	https://www.bloomberg.com/profile/person/16806497

Falabella	Sandro Donaggio	Empresa de família	Family Business	https://www.forbes.com/profile/piero-solari-donaggio/?sh=20626634c657
Liberty Global	Mike Fries	Operations	Operations	https://www.bloomberg.com/profile/person/1986381
Larsen & Toubro	Anil Manibhai	Engineering	Innovation	https://www.larsentoubro.com/corporate/about-lt-group/leadership/board-of-directors/a-m-naik/
Assa Abloy	Johan Molin	Financial and marketing	Financial	https://www.crunchbase.com/person/johan-molin https://www.linkedin.com/in/johan-molin-9a088997/
Hikvision	Yang Hu	?	Assorted	https://www.bloomberg.com/profile/person/16745885
Constellation Brands	Robert Sands	Empresa de família	Family Business	https://www.cbrands.com/story/leadership/sands-rob
Coca-Cola	Ahmet Kent	Operations	Operations	https://www.linkedin.com/in/muhtarkent/
Omnicom Group	John Wren	Financial	Financial	https://www.notablebiographies.com/newsmakers2/2007-Pu-Z/Wren-John.html
Paychex	Martin Mucci	Operations	Operations	https://www.linkedin.com/in/martin-mucci-b6500221/
Starwood Hotels	Thomas Mangas	Financial	Financial	https://www.linkedin.com/in/thomas-mangas/ https://www.bloomberg.com/profile/person/16592561
ITV	Adam Crozier	Assorted	Assorted	https://www.bloomberg.com/profile/person/3461305 https://www.bloomberg.com/profile/person/3461305
Church & Dwight	Matthew Farrell	Operations	Operations	https://www.linkedin.com/in/matthew-farrell-b7006a4/
Grifols	Víctor Roura	Empresa de família	Family Business	https://www.grifols.com/en/victor-grifols-roura
AVIC Aviation Engine	Fu Shun Ning	Not found	Assorted	-

2017

Company	**CEO**	**Background**	**Classification 2017**	**Source**
Salesforce.com	Marc Benioff	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1983575
Tesla	Elon Reeve Musk	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1954518
Amazon.com	Jeffrey Bezos	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1642252
Shanghai RAAS Blood Products	Jie Chen	Not found	Assorted	http://www.raas-corp.com/page.aspx?node=143&f=en
Netflix	Reed Hastings	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1971023
Incyte	Hervé Hoppenot	Commercial	Commercial	https://www.linkedin.com/in/herve-hoppenot-4b912b9/
Hindustan Unilever	Sanjiv Soshil Mehta	Commercial	Commercial	https://www.linkedin.com/in/sanjivmehtaunilever/?originalSubdomain=in
Asian Paints	K B S Anand	Marketing	Commercial	https://www.tatachemicals.com/about-us/Leadership-team/kbs-anand
Naver	Seong-Sook Han	Operations	Operations	https://executives.technology/han-seong-sook-2/
Regeneron Pharmaceuticals	Leonard Schleifer	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1463677
Unilever Indonesia	Hemant Bakshi	Sales & Customer Development	Commercial	https://www.bloomberg.com/profile/person/16337908
BioMarin Pharmaceutical	Jean-Jacques Bienaimé	Marketing	Commercial	https://www.linkedin.com/in/jean-jacques-bienaime-04554a2/
Monster Beverage	Rodney Sacks	Founder	Entrepreneur	https://successstory.com/people/rodney-sacks
Adobe Systems	Shantanu Narayen	Research	Innovation	https://www.bloomberg.com/profile/person/3332391
Autodesk	Andrew Anagnost	Engineering and Product Development	Innovation	https://www.linkedin.com/in/andrewanagnost/
Amorepacific	Sang-Bae Shim	Family Business	Family Business	http://m.koreaherald.com/view.php?ud=20160711000974
Vertex Pharmaceuticals	Jeffrey Leiden	Innovation	Innovation	https://www.linkedin.com/in/jeffreyleiden/
Illumina	Francis deSouza	Product	Innovation	https://www.linkedin.com/in/francisdesouza/

Marriott International	Arne Sorenson	Operations, finance	Operations	https://www.linkedin.com/in/arnesorenson/
Alexion Pharmaceuticals	Ludwig Hantson	R&D	Innovation	https://www.linkedin.com/in/ludwighantson/
CP All	Tanin Buranamanit	Marketing	Commercial	https://www.bloomberg.com/profile/person/17875979
Constellation Software	Mark H Leonard	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/4213610
Red Hat	James Whitehurst	Operations	Operations	https://www.linkedin.com/in/jiwhitehurst/
Tencent Holdings	HuaTeng Ma	Founder	Entrepreneur	https://www.linkedin.com/in/%E5%8C%96%E8%85%BE-%E9%A9%AC-41a43a114/
FleetCor Technologies	Ronald Clarke	Operations	Operations	https://www.bloomberg.com/profile/person/1488050
Rakuten	Hiroshi Mikitani	Founder	Entrepreneur	https://www.linkedin.com/in/mikitani/?originalSubdomain=jp
Sysmex	Hisashi Ietsugu	Assorted	Assorted	https://www.bloomberg.com/profile/person/3206697
LG Household & Health Care	Suk-Yong Cha	Financial	Financial	https://www.bloomberg.com/profile/person/2110927
Coloplast	Lars Rasmussen	Operations	Operations	https://www.linkedin.com/in/larserasmussen/
Nielsen	Dwight Barns	Marketing	Commercial	https://www.linkedin.com/in/mitch-barns/
IDEXX Laboratories	Jonathan W. Ayers	Strategy	Strategy	https://www.bloomberg.com/profile/person/3107510
Fast Retailing	Tadashi Yanai	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3074722
Almarai	Georges Schorderet	Operations, financial	Operations	https://www.bloomberg.com/profile/person/1507040
Ulta Salon Cosmetcs & Fragrance	Mary Dillon	Marketing	Commercial	https://www.linkedin.com/in/mary-dillon-2382808/
Hermès International	Henri-Louis Bauer	Assorted	Assorted	https://www.marketscreener.com/business-leaders/Henri-Louis-Bauer-2065/biography/
Ihs Markit	Lance Uggla	Founder	Entrepreneur	https://www.linkedin.com/in/lanceuggla/?originalSubdomain=uk
Unicharm	Takahisa Takahara	Family Business	Family Business	https://www.forbes.com/profile/takahisa-takahara/?sh=4a6383e8cdc1
Verisk Analytics	Scott Stephenson	Operations	Operations	https://www.bloomberg.com/profile/person/3480985
Genmab	Jan G. J. van de Winkel	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3637425

AmerisourceBergen	Steven Collis	Operations	Operations	https://www.bloomberg.com/profile/person/1903472
Expedia	Mark Okerstrom	Financial	Financial	https://www.linkedin.com/in/mark-okerstrom-302175/
Starbucks	Kevin Johnson	Engineer, Operations, sales, mkt	Innovation	https://www.linkedin.com/in/kevjohns/
Shimano	Yozo Shimano	Family Business	Family Business	https://ciaobikeitaly.com/blog/history-of-shimano-the-presidents/
Sirius XM Radio	James E Meyer	Product Management, Operations, sales, mkt	Innovation	https://www.bloomberg.com/profile/person/1512842
Visa	Alfred Kelly Jr	Strategy	Strategy	https://www.bloomberg.com/profile/person/2121459
Perrigo	John Hendrickson	Operations	Operations	https://www.linkedin.com/in/john-hendrickson-3579451b/
Kangde Xin Composite Material Group	Yu Zhong	Assorted	Assorted	https://www.marketscreener.com/business-leaders/Yu-Zhong-0CFVDL-E/biography/
Smith & Nephew	Olivier Bohuon	Commercial	Commercial	https://www.linkedin.com/in/olivier-bohuon-a044872/?originalSubdomain=uk
Keyence	Akinori Yamamoto	Assorted	Assorted	https://www.bloomberg.com/profile/person/16440602
Global Payments	Jeffrey Sloan	Assorted	Assorted	https://www.bloomberg.com/profile/person/4429149
CR Bard	Timothy Ring	Strategy	Strategy	https://www.crunchbase.com/person/timothy-m-ring
Mastercard	Ajay Banga	Operations	Operations	https://www.bloomberg.com/profile/person/4676567
Magnit	Sergey Galitskiy	Founder	Entrepreneur	https://www.forbes.com/profile/sergei-galitsky/?sh=7e3edfb075cc
Anheuser-Busch InBev	Carlos Alves de Brito	Operatios	Operations	https://www.bloomberg.com/profile/person/7558238
Ctrip.com International	Jane Jie Sun	Operations	Operations	https://www.linkedin.com/in/jane-sun-54b384193/?originalSubdomain=cn
Oriental Land	Toshio Kagami	Assorted	Assorted	https://www.bloomberg.com/profile/person/1812623
TransDigm Group	Kevin Stein	Operations	Operations	https://www.linkedin.com/in/kevin-m-stein-1a968910/
Booking Holdings	Glenn Fogel	Strategy	Strategy	https://www.linkedin.com/in/glennfogel/
Lindt & Sprungli	Dieter R. Weisskopf	Financial	Financial	https://www.bloomberg.com/profile/person/1446269

Baidu	Robin Li	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/7374131
Intuitive Surgical	Gary Guthart	Product, engineering, operations	Innovation	https://www.bloomberg.com/profile/person/3429541
Chipotle Mexican Grill	Steve Ells	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15002696
Norilsk Nickel	Vladimir Olegovich Potanin	Assorted	Assorted	https://www.bloomberg.com/profile/person/1642676
Dassault Systemes	Bernard Charlès	R&D	Innovation	https://www.linkedin.com/in/dassaultsystemesceo/
Roper Technologies	Brian Jellison	Assorted	Assorted	https://www.bloomberg.com/profile/person/1513524
Intuit	Brad Smith	Marketing	Commercial	https://www.linkedin.com/in/braddsmithintuit/ https://www.bloomberg.com/profile/person/6294100
Brown-Forman	Paul Varga	Marketing	Commercial	https://www.brown-forman.com/about/corporate-governance/profiles/paul-varga/
Essilor International	Hubert Sagnières	Marketing	Commercial	https://peoplepill.com/people/hubert-sagnieres/
Iliad	Maxime Lombardini	Production	Operations	https://www.linkedin.com/in/maxime-lombardini-5bb93219a/
Inditex	Pablo Álvarez De Tejera	Legal Affairs	Legal Affairs	https://www.bloomberg.com/profile/person/1438094
Equifax	Mark Begor	Operations	Operations	https://www.linkedin.com/in/mark-begor-1837b58b/
Edwards Lifesciences	Michael Mussallem	Engineering and Product Development	Innovation	https://www.bloomberg.com/profile/person/1835754
Reckitt Benckiser Group	Rakesh Kapoor	Marketing	Commercial	https://www.crunchbase.com/person/rakesh-kapoor
Constellation Brands	Robert Sands	Empresa de família	Family Business	https://www.cbrands.com/story/leadership/sands-rob
Pandora	Anders Colding Friis	Marketing	Commercial	https://www.linkedin.com/in/anderscoldingfriis/?originalSubdomain=dk https://www.bloomberg.com/profile/person/15744619

Luxottica Group	Francesco Milleri	Consultant	Consultancy	https://in.reuters.com/finance/stocks/officer-profile/ESSI.H/3003578 https://www.bloomberg.com/profile/person/19706482
Mead Johnson Nutrition	Peter Jakobsen	Operations	Operations	https://www.bloomberg.com/profile/person/16353059
Bharti Airtel	Gopal Vittal	Marketing	Commercial	https://www.bloomberg.com/profile/person/16337903
Coca-Cola	James Quincey	Operations	Operations	https://www.bloomberg.com/profile/person/15756380
Geberit	Christian Buhl	Sales	Commercial	https://www.bloomberg.com/profile/person/19077225
Cerner	Brent Shafer	Sales	Commercial	https://www.linkedin.com/in/brentshafer2/
Jiangsu Hengrui Medicine	Yun Zhou	Assorted	Assorted	https://www.zonebourse.com/barons-bourse/Yun-Shu-Zhou-7329/biographie/
SGS	Frankie Ng	Operations	Operations	https://www.bloomberg.com/profile/person/6546865
Yahoo Japan	Manabu Miyasaka	Product	Innovation	https://www.linkedin.com/in/miyasaka/?originalSubdomain=jp
Molson Coors Brewing	Mark Hunter	Commercial	Commercial	https://www.linkedin.com/in/mark-hunter-6490a194/
General Mills	Jeff Harmening	Operations	Operations	https://www.linkedin.com/in/jeff-harmening/
Ramsay Health Care	Christopher Paul Rex	Operations	Operations	https://www.bloomberg.com/profile/person/16081320
Boston Scientific	Michael Mahoney	Assorted	Assorted	https://www.linkedin.com/in/mike-mahoney-a9873354/ https://www.bloomberg.com/profile/person/16355514
Procter & Gamble	David Taylor	Marketing	Commercial	https://www.linkedin.com/in/davidtaylorpg/
Falabella	Sandro Donaggio	Empresa de família	Family Business	https://www.linkedin.com/in/indranooyi/
Mondelēz International	Dirk van de Put	Operations	Operations	https://www.linkedin.com/in/dirkvandeput/
Compass Group	Dominic Blakemore	Operations	Operations	https://www.linkedin.com/in/dominic-blakemore-639210103/?originalSubdomain=uk

Cielo	Eduardo Campozana Gouveia	Marketing	Commercial	https://origin.www.bloomberg.com/profile/person/16447861
Experian	Brian Cassin	Financial	Financial	https://www.linkedin.com/in/briancassin/?originalSubdomain=uk
PepsiCo	Indra Nooyi	Financial	Financial	https://www.linkedin.com/in/indranooyi/
Fanuc	Yoshiharu Inaba	Family Business	Family Business	https://asia.nikkei.com/Business/Companies/Robot-maker-Fanuc-s-CEO-steps-back-after-16-years-at-controls https://www.bloomberg.com/profile/person/1814237
Colgate-Palmolive	Ian Cook	Operations	Operations	https://www.bloomberg.com/profile/person/1558387
McCormick	Lawrence Kurzius	Operations	Operations	https://www.linkedin.com/in/lawrence-kurzius-a09b1021/
LabCorp	David King	Operations	Operations	https://www.linkedin.com/in/davidp-king/
ASML Holding	Peter T. F. M. Wennink	Financial	Financial	https://www.bloomberg.com/profile/person/1852674

2018

Company	CEO	Background	Classification 2018	Source
ServiceNow	John Donahoe	Consultant	Consultancy	https://www.bloomberg.com/profile/person/2380003 https://www.linkedin.com/in/john-donahoe-8b591452/
Workday	Aneel Bhusri	Founder	Entrepreneur	https://www.linkedin.com/in/aneelbhusri/ https://www.workday.com/en-us/company/about-workday/leadership/aneel-bhusri.html
Salesforce	Marc Russell Benioff	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1983575
Tesla	Elon Reeve Musk	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1954518
Amazon	Jeffrey Bezos	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1642252
Netflix	Reed Hastings Jr.	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1971023
Incyte	Hervé Hoppenot	Commercial	Commercial	https://www.linkedin.com/in/herve-hoppenot-4b912b9/
Hindustan Unilever	Sanjiv Soshil Mehta	Commercial	Commercial	https://www.linkedin.com/in/sanjivmehtaunilever/?originalSubdomain=in
Naver	Seong-Sook Han	Quality	Operations	https://executives.technology/han-seong-sook-2/
Facebook	Mark Zuckerberg	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15103277
Monster Beverage	Rodney Cyril Sacks	Founder	Entrepreneur	https://successstory.com/people/rodney-sacks
Unilever Indonesia	Hemant Bakshi	Sales & Customer Development	Commercial	https://www.bloomberg.com/profile/person/16337908
Adobe Systems	Shantanu Narayen	Research	Innovation	https://www.bloomberg.com/profile/person/3332391
Celltrion	Wu-Sung Ki	Assorted	Assorted	https://www.bloomberg.com/profile/person/16438227
Autodesk	Andrew Anagnost	Engineering and Product Development	Innovation	https://www.linkedin.com/in/andrewanagnost/

Regeneron Pharmaceuticals	Leonard S. Schleifer	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1463677
Vertex Pharmaceuticals	Jeffrey Leiden	Innovation	Innovation	https://www.linkedin.com/in/jeffreyleiden/
Amorepacific	Suh Kyung-Bae	Family Business	Family Business	http://m.koreaherald.com/view.php?ud=20160711000974
AmerisourceBergen	Steven H. Collis	Operations	Operations	https://www.bloomberg.com/profile/person/1903472
Illumina	Francis A. deSouza	Product	Innovation	https://www.linkedin.com/in/francisdesouza/
Marriott	Arne M. Sorenson	Operations	Operations	https://www.linkedin.com/in/arnesorenson/
Alexion Pharmaceuticals	Ludwig Hantson	R&D	Innovation	https://www.linkedin.com/in/ludwighantson/ https://alexion.com/our-company/leadership/ludwig-hantson
CP All	Tanin Buranamanit	Marketing	Commercial	https://www.bloomberg.com/profile/person/17875979
Red Hat	James Whitehurst	Operations	Operations	https://www.linkedin.com/in/jiwhitehurst/
Tencent Holdings	Hua Teng Ma	Founder	Entrepreneur	https://www.linkedin.com/in/%E5%8C%96%E8%85%BE-%E9%A9%AC-41a43a114/
FleetCor Technologies	Ronald Clarke	Marketing	Operations	https://www.bloomberg.com/profile/person/1488050
LG Household & Health Care	Suk-Yong Cha	Financial	Financial	https://www.bloomberg.com/profile/person/2110927
Ctrip.com International	Jane Jie Sun	Operations	Operations	https://www.linkedin.com/in/jane-sun-54b384193/?originalSubdomain=cn
Hermès International	Henri-Louis Bauer	Commercial	Commercial	https://www.marketscreener.com/business-leaders/Henri-Louis-Bauer-2065/biography/
Starbucks	Kevin Johnson	Operations	Innovation	https://www.linkedin.com/in/kevjohns/
Align Technology	Joseph M. Hogan	Product, Mkt, Operations	Innovation	https://www.bloomberg.com/profile/person/2159789 http://investor.aligntech.com/board-directors-management/joseph-hogan

Fast Retailing	Tadashi Yanai	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/3074722
Ihs Markit	Lance Uggla	Founder	Entrepreneur	https://www.linkedin.com/in/lanceuggla/?originalSubdomain=uk
Expedia	Mark Okerstrom	Financial	Financial	https://www.linkedin.com/in/mark-okerstrom-302175/
Sirius XM Radio	James E Meyer	Product Management, Operations, sales, mkt	Innovation	https://www.bloomberg.com/profile/person/1512842
Visa	Alfred Kelly Jr	Marketing	Strategy	https://www.bloomberg.com/profile/person/2121459
Anheuser-Busch InBev	Carlos Alves de Brito	Sales	Operations	https://www.bloomberg.com/profile/person/7558238
Keyence	Akinori Yamamoto	Consultant	Consultancy	https://www.bloomberg.com/profile/person/16440602
CR Bard	Timothy Ring	Human Resources	Strategy	https://www.crunchbase.com/person/timothy-m-ring
Oriental Land	Toshio Kagami	Human Resources	Human Resources	https://www.bloomberg.com/profile/person/1812623
Molson Coors Brewing	Mark Hunter	Commercial	Commercial	https://www.linkedin.com/in/mark-hunter-6490a194/
Booking Holdings	Glenn Fogel	Strategy	Strategy	https://www.linkedin.com/in/glennfogel/
China Molybdenum	Fa Ben Li	Assorted	Assorted	https://www.bloomberg.com/profile/person/15369005
Intuitive Surgical	Gary Guthart	Operations	Innovation	https://www.bloomberg.com/profile/person/3429541
Baidu	Yan Hong Li	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/7374131
Mastercard	Ajay Banga	Operations	Operations	https://www.bloomberg.com/profile/person/4676567
Falabella	Sandro Donaggio	Empresa de família	Family Business	https://www.linkedin.com/in/indranooyi/
Dassault Systemes	Bernard Charlès	R&D	Innovation	https://www.linkedin.com/in/dassaultsystemesceo/
General Mills	Jeff Harmening	Operations	Operations	https://www.linkedin.com/in/jeff-harmening/
Roper Technologies	Brian Jellison	Financial	Financial	https://www.bloomberg.com/profile/person/1513524
Intuit	Brad Smith	Marketing	Commercial	https://www.linkedin.com/in/braddsmithintuit/

Essilor International	Hubert Sagnières	Marketing	Commercial	https://peoplepill.com/people/hubert-sagnieres/
Coca-Cola	James Quincey	Operations	Operations	https://www.bloomberg.com/profile/person/15756380
Inditex	Pablo Álvarez De Tejera	Legal	Legal Affairs	https://www.bloomberg.com/profile/person/1438094
Edwards Lifesciences	Michael Mussallem	Engineering and Product Development	Innovation	https://www.bloomberg.com/profile/person/1835754
Reckitt Benckiser Group	Rakesh Kapoor	Marketing	Commercial	https://www.crunchbase.com/person/rakesh-kapoor
Experian	Brian Cassin	Financial	Financial	https://www.linkedin.com/in/briancassin/?originalSubdomain=uk
Constellation Brands	Robert Sands	Empresa de família	Family Business	https://www.cbrands.com/story/leadership/sands-rob
Kone	Henrik Ehrnrooth	Financial	Financial	https://www.linkedin.com/in/henrik-ehrnrooth-kone/?originalSubdomain=fi
Brown-Forman	Paul Varga	Marketing	Commercial	https://www.brown-forman.com/about/corporate-governance/profiles/paul-varga/
Luxottica Group	Francesco Milleri	Consultant	Consultancy	https://in.reuters.com/finance/stocks/officer-profile/ESSI.H/3003578
Mondelēz International	Dirk van de Put	Operations	Operations	https://www.linkedin.com/in/dirkvandeput/
Compass Group	Dominic Blakemore	Financial	Operations	https://www.linkedin.com/in/dominic-blakemore-639210103/?originalSubdomain=uk
Jiangsu Hengrui Medicine	Yun Zhou	Not found	Assorted	https://www.zonebourse.com/barons-bourse/Yun-Shu-Zhou-7329/biographie/
Boston Scientific	Michael Mahoney	Assorted	Assorted	https://www.linkedin.com/in/mike-mahoney-a9873354/
Procter & Gamble	David Taylor	Marketing	Commercial	https://www.linkedin.com/in/davidtaylorpg/

PepsiCo	Indra Nooyi	Financial	Financial	https://www.linkedin.com/in/indranooyi/
Cerner	Brent Shafer	Sales	Commercial	https://www.linkedin.com/in/brentshafer2/
Yahoo Japan	Manabu Miyasaka	Product	Innovation	https://www.linkedin.com/in/miyasaka/?originalSubdomain=jp
Unilever	Paul Polman	Financial	Financial	https://www.linkedin.com/in/paulpolman/?originalSubdomain=uk
Colgate-Palmolive	Ian Cook	Operations	Operations	https://www.bloomberg.com/profile/person/1558387
Sodexo	Denis Machuel	Benefits and Rewards Services	Human Resources	https://www.linkedin.com/in/denismachuel/?originalSubdomain=fr
United Parcel Service	David P. Abney	Operations	Operations	https://www.linkedin.com/in/davidabneyups/
Cielo	Eduardo Campozana Gouveia	Commercial	Commercial	https://origin.www.bloomberg.com/profile/person/16447861
ASML Holding	Peter T. F. M. Wennink	Financial	Financial	https://www.bloomberg.com/profile/person/1852674
Paychex	Martin Mucci	Operations	Operations	https://www.linkedin.com/in/martin-mucci-b6500221/
Clorox	Benno O. Dorer	Operations	Operations	https://www.linkedin.com/in/benno-dorer-364126/
Assa Abloy	Nico Delvaux	Sales and Marketing	Innovation	https://www.linkedin.com/in/nico-delvaux/?originalSubdomain=se https://www.bloomberg.com/profile/person/17379815
Alphabet	Sundar Pichai	Product, consultant	Innovation	https://www.bloomberg.com/profile/person/15004624
Nidec	Shigenobu Nagamori	Founder	Entrepreneur	https://www.nidec.com/en/corporate/about/board/nagamori/
Fanuc	Yoshiharu Inaba	Family Business	Family Business	https://www.bloomberg.com/profile/person/1814237 https://asia.nikkei.com/Business/Companies/Robot-maker-Fanuc-s-CEO-steps-back-after-16-years-at-controls
Allergan	Brenton Saunders	Assorted	Assorted	https://www.linkedin.com/in/brentlsaunders/

Hershey	Michele G. Buck	Marketing	Commercial	https://www.bloomberg.com/profile/person/4342074
Waste Connections	Ronald J. Mittelstaedt	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1926075
RELX Group	Erik Niklas Engstrom	Consultant	Consultancy	https://www.bloomberg.com/profile/person/1805576
Larsen & Toubro	Sekharipuram Narayan Subrahmanyan	Infrastructure	Assorted	https://www.bloomberg.com/profile/person/17365433
Shiseido	Masahiko Uotani	Consultant	Consultancy	https://www.bloomberg.com/profile/person/4248852
Kellogg	Steven A. Cahillane	Marketing	Commercial	https://www.bloomberg.com/profile/person/4718688
Republic Services	Donald W. Slager	Operations	Operations	https://www.bloomberg.com/profile/person/1954171
Hikvision	Yang Hu	Assorted	Assorted	https://www.bloomberg.com/profile/person/16745885
China Shipbuilding Industry	Liang Wang	Assorted	Assorted	https://www.bloomberg.com/profile/person/20591529
Bharti Airtel	Gopal Vittal	Marketing	Commercial	https://www.bloomberg.com/profile/person/16337903
Ecolab	Douglas M. Baker, Jr.	Operations	Operations	https://www.bloomberg.com/profile/person/4031162
L'Oréal Group	Jean-Paul Agon	Product, management	Innovation	https://www.bloomberg.com/profile/person/3960420 https://www.loreal.com.br/grupo-l%C2%B4or%C3%A9al/governan%C3%A7a/comit%C3%AA-executivo/jean-paul-agon
NXP Semiconductors	Richard Lynn Clemmer	Financial	Financial	https://www.bloomberg.com/profile/person/14024386
Sun Pharmaceuticals Industries	Dilip Shantilal Shanghvi	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1704760
The Estée Lauder Companies	Fabrizio Freda	Operations	Operations	https://www.bloomberg.com/profile/person/6771470
Diageo	Ivan M. Menezes	Operations	Operations	https://www.bloomberg.com/profile/person/3529121
Maruti Suzuki India	Kenichi Ayukawa	Assorted	Assorted	https://www.bloomberg.com/profile/person/16133577
Norilsk Nickel	Vladimir Olegovich Potanin	Financial	Financial	https://www.bloomberg.com/profile/person/1642676

2019

Company	**CEO**	**Background**	**Classification 2019**	**Source**
Alphabet/Google	Sundar Pichai	Product, consultant	Innovation	https://www.bloomberg.com/profile/person/15004624
Amazon	Jeffrey P. Bezos	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1642252
Apple	Tim Cook	Operations	Operations	https://www.bloomberg.com/profile/person/14014370
Microsoft	Satya Nadella	R&D	Innovation	https://www.linkedin.com/in/satyanadella/ https://www.bloomberg.com/profile/person/3224315
Samsung Electronics	Koh Dong-Jin, Kim Hyun-Suk	R&D	Innovation	https://www.bloomberg.com/profile/person/18394818 https://www.bloomberg.com/profile/person/18966881
Netflix	Reed Hastings, Jr.	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1971023
IBM	Ginni Rometty	Engineer, sales	Innovation	https://www.bloomberg.com/profile/person/3970902
Facebook	Mark Elliot Zuckerberg	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15103277
Tesla	Elon Reeve Musk	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1954518
Adidas	Kasper Rorsted	HR	Human Resource	https://www.bloomberg.com/profile/person/1920667
Boeing	Dennis Muilenburg	Operations	Operations	https://www.bloomberg.com/profile/person/3105929
BASF	Martin Brudermüller	Technology, strategy, sales, marketing	Innovation	https://www.bloomberg.com/profile/person/6065215 https://www.basf.com/global/en/who-we-are/organization/management/board-of-executive-directors/dr-martin-brudermueller.html
T-Mobile	John J Legere	Strategy	Strategy	https://www.bloomberg.com/profile/person/1729754
Johnson & Johnson	Alex Gorsky	Operations	Operations	https://www.linkedin.com/in/alex-gorsky/

DowDuPont	Edward D Breen	Operations	Operations	https://www.bloomberg.com/profile/person/14015588
Siemens	Joe Kaeser	Financial	Financial	https://www.bloomberg.com/profile/person/6602396 https://www.linkedin.com/in/joe-kaeser/?originalSubdomain=de
Cisco Systems	Chuck Robbins	Operations	Operations	https://www.linkedin.com/in/chuck-robbins-9b47a195/
LG Electronics	Jo Seong-Jin	Assorted	Assorted	https://www.bloomberg.com/profile/person/18299045
Vale	Eduardo Bartolomeo	Operations	Operations	https://www.linkedin.com/in/eduardobartolomeo/?originalSubdomain=br
JPMorgan Chase	Jamie Dimon	Operations	Operations	https://www.linkedin.com/in/jamie-dimon-65634172/
McDonald's	Chris Kempczinski	Innovation, strategy, project, consultancy	Innovation	https://www.linkedin.com/in/chriskempczinski/
Marriott	Arne M. Sorenson	Operations	Operations	https://www.linkedin.com/in/arnesorenson/
Alibaba	Daniel Zhang	Financial	Financial	https://www.linkedin.com/in/daniel-zhang-498211120/?originalSubdomain=cn
Bayer	Werner Baumann	Strategy	Strategy	https://www.bloomberg.com/profile/person/4758224 https://www.linkedin.com/in/werner-baumann/
AT&T	Randall Stephenson	Operations	Operations	https://www.bloomberg.com/profile/person/1898942
Allianz	Oliver Bäte	Financial	Financial	https://www.linkedin.com/in/oliver-b%C3%A4te/?originalSubdomain=de
BMW	Oliver Zipse	Innovation, product	Innovation	https://www.bloomberg.com/profile/person/18002088
SAP	Christian Klein	Operations	Operations	https://www.linkedin.com/in/christian-klein/?originalSubdomain=de
Philips	Frans van Houten	Sales	Commercial	https://www.linkedin.com/in/frans-van-houten-5b0a62a/?originalSubdomain=nl
Royal Dutch Shell	Ben van Beurden	Manufacturing	Operations	https://www.linkedin.com/in/benvanbeurden/?originalSubdomain=nl

AXA	Thomas Buberl	Marketing	Commercial	https://www.linkedin.com/in/thomas-buberl/?originalSubdomain=fr https://www.bloomberg.com/profile/person/16182457
Unilever	Alan Jope	Operations	Operations	https://www.unilever.com/about/who-we-are/our-leadership/alan-jope.html https://www.linkedin.com/in/alanjope/?originalSubdomain=uk
Salesforce	Marc Russell Benioff	Founder	Entrepreneur	https://www.linkedin.com/in/marcbenioff/
Pfizer	Albert Bourla	Innovation, products, marketing	Innovation	https://www.linkedin.com/in/albert-bourla-1a087219/
Stryker	Kevin A. Lobo	Financial	Financial	https://www.bloomberg.com/profile/person/15125389
NTT Docomo	Kazuhiro Yoshizawa	Technology, strategy, research, HR, sales, mkt	Innovation	https://www.bloomberg.com/profile/person/16328643 https://www.nttdocomo.co.jp/english/corporate/about/outline/yoshizawa_kazuhiro.html
Toyota	Akio Toyoda	Family business	Family business	https://www.bloomberg.com/profile/person/3304465 https://en.wikipedia.org/wiki/Akio_Toyoda
Volkswagen	Herbert Diess	Purchasing	Operations	https://www.linkedin.com/in/herbertdiess/
3M	Mike Roman	Engineer, Operations, quality	Innovation	https://www.bloomberg.com/profile/person/16348076
General Motors	Mary Barra	Product Development, HR, manufacturing engineering, operations, communications	Innovation	https://www.linkedin.com/in/mary-barra-29469712/
Dell	Michael Dell	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1443674
Walmart	Doug McMillon	Marketing	Commercial	https://www.linkedin.com/in/dougmcmillon/ https://www.bloomberg.com/profile/person/3063017
eBay	Devin Wenig	Operations	Operations	https://www.linkedin.com/in/devin-wenig-b3488082/ https://www.bloomberg.com/profile/person/4300278

HP	Dion Weisler	Operations	Operations	https://www.linkedin.com/in/dion-weisler-4355183/ https://www.bloomberg.com/profile/person/16725406
ING	Ralph Hamers	Commercial	Commercial	https://www.linkedin.com/in/ralphhamers/?originalSubdomain=nl
BP	Bob Dudley	Assorted	Assorted	https://www.linkedin.com/in/bobdudley/?originalSubdomain=uk
Daimler	Ola Källenius	Research, sales. Mkt, operations	Innovation	https://www.daimler.com/company/corporate-governance/board-of-management/kaellenius/ https://www.linkedin.com/in/ola-k%C3%A4llenius/?originalSubdomain=de
Huawei	Ren Zhengfei	Founder	Entrepreneur	https://www.huawei.com/br/facts/voices-of-huawei/interview-with-ren-zhengfei
Rio Tinto	Jean-Sébastien Jacques	Operations	Operations	https://www.bloomberg.com/profile/person/16185709
Hilton	Christopher J. Nassetta	Operations	Operations	https://www.linkedin.com/in/chrisnassetta/

2020

Company	**CEO**	**Background**	**Classification 2020**	**Source**
Apple	Tim Cook	Operations	Operations	https://www.bloomberg.com/profile/person/14014370
Alphabet	Sundar Pichai	Product, consultant	Innovation	https://www.bloomberg.com/profile/person/15004624
Amazon	Jeffrey P. Bezos	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1642252
Microsoft	Satya Nadella	R&D	Innovation	https://www.linkedin.com/in/satyanadella/
Samsung Electronics	Koh Dong-Jin, Kim Hyun-Suk	R&D	Innovation	https://www.bloomberg.com/profile/person/18394818
Huawei	Ren Zhengfei	Founder	Entrepreneur	https://www.huawei.com/br/facts/voices-of-huawei/interview-with-ren-zhengfei
Alibaba	Daniel Zhang	Financial	Financial	https://www.linkedin.com/in/daniel-zhang-498211120/?originalSubdomain=cn
IBM	Arvind Krishna	Research, manufacturing, products	Innovation	https://www.linkedin.com/in/arvindkrishna/
Sony	Kenichiro Yoshida	Financial	Financial	https://www.bloomberg.com/profile/person/7165929
Facebook	Mark Elliot Zuckerberg	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/15103277
Tesla	Elon Reeve Musk	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1954518
Cisco Systems	Chuck Robbins	Operations	Operations	https://www.linkedin.com/in/chuck-robbins-9b47a195/
Walmart	Doug McMillon	Marketing	Commercial	https://www.linkedin.com/in/dougmcmillon/
Tencent	Ma Huateng	Founder	Entrepreneur	https://www.forbes.com/profile/ma-huateng/?sh=5c36869a5437
HP	Dion Weisler	Operations	Operations	https://www.linkedin.com/in/dion-weisler-4355183/
Nike	John Donahoe	Consultant	Consultancy	https://www.linkedin.com/in/john-donahoe-8b591452/
Netflix	Reed Hastings, Jr.	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1971023
LG Electronics	Brian Kwon	Assorted	Assorted	https://www.bloomberg.com/profile/person/18965604

Intel	Bob Swan	Financial	Financial	https://www.linkedin.com/in/bob-swan-263aa07/
Dell	Michael Dell	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1443674
Siemens	Joe Kaeser	Financial	Financial	https://www.bloomberg.com/profile/person/6602396
Target	Brian Cornell	Marketing	Commercial	https://www.bloomberg.com/profile/person/1841158
Philips	Frans van Houten	Sales	Commercial	https://www.linkedin.com/in/frans-van-houten-5b0a62a/?originalSubdomain=nl
Xiaomi	Lei Jun	Founder	Entrepreneur	https://www.linkedin.com/in/lei-jun-6846696/?originalSubdomain=cn
Oracle	Larry Ellison	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/1491757
Johnson & Johnson	Alex Gorsky	Operations	Operations	https://www.linkedin.com/in/alex-gorsky/
SAP	Christian Klein	Operations	Operations	https://www.linkedin.com/in/christian-klein/?originalSubdomain=de
Adidas	Kasper Rorsted	HR	Human Resource	https://www.bloomberg.com/profile/person/1920667
Hitachi	Toshiaki Higashihara	Operations	Operations	https://www.bloomberg.com/profile/person/15219855
Costco	W Craig Jelinek	Operations	Operations	https://www.bloomberg.com/profile/person/1505432
JD.com	Liu Qiangdong	Founder	Entrepreneur	https://www.bloomberg.com/profile/person/17167866
Volkswagen	Herbert Diess	Purchasing	Operations	https://www.linkedin.com/in/herbertdiess/
Bosch	Volkmar Denner	Sales	Commercial	https://www.bloomberg.com/profile/person/16198297
Airbus	Guillaume Faury	R&D, engineer, commercial	Innovation	https://www.linkedin.com/in/guillaume-faury-84a494150/?originalSubdomain=fr
Salesforce	Marc Russell Benioff	Founder	Entrepreneur	https://www.linkedin.com/in/marcbenioff/
JPMorgan Chase	Jamie Dimon	Operations	Operations	https://www.linkedin.com/in/jamie-dimon-65634172/
Uber	Dara Khosrowshahi	Financial	Financial	https://www.linkedin.com/in/dara-khosrowshahi-70949862/
Bayer	Werner Baumann	Strategy	Strategy	https://www.bloomberg.com/profile/person/4758224
Procter & Gamble	David Taylor	Marketing	Commercial	https://www.linkedin.com/in/davidtaylorpg/

Royal Dutch Shell	Ben van Beurden	Manufacturing	Operations	https://www.linkedin.com/in/davidtaylorpg/
Toyota	Akio Toyoda	Family business	Family business	https://www.bloomberg.com/profile/person/3304465
Nestlé	Ulf Mark Schneider	Financial	Financial	https://www.bloomberg.com/profile/person/4359213
ABB	Bjorn Rosengren	Assorted	Assorted	https://www.bloomberg.com/profile/person/1819405 https://www.linkedin.com/in/bj%C3%B6rn-rosengren/?originalSubdomain=ch
3M	Mike Roman	Engineer, Operations, quality	Innovation	https://www.bloomberg.com/profile/person/16348076 https://www.linkedin.com/in/mike-roman-7758204/
Unilever	Alan Jope	Operations	Operations	https://www.unilever.com/about/who-we-are/our-leadership/alan-jope.html
FCA	Michael Manley	Operations	Operations	https://www.bloomberg.com/profile/person/15047817
Novartis	Vasant Narasimhan	Drug (product) Development, mkt	Innovation	https://www.linkedin.com/in/vasnarasimhan/?originalSubdomain=ch
Coca-Cola	James Quincey	Operations	Operations	https://www.bloomberg.com/profile/person/15756380
Volvo	Martin Lundstedt	Engineer	Innovation	https://www.bloomberg.com/profile/person/15344045
McDonald's	Chris Kempczinski	Innovation, strategy, project, consultancy	Innovation	https://www.linkedin.com/in/chriskempczinski/

Detailed analysis of innovative CEOs

CEO	Country	Rank Year	Company	Background		Last position within innovation	Innovation experience				Promoted to CEO	Time between innovation experience and CEO position	
					Diverse		Start	End	Duration (months)	Duration (years)		Months	Years
An Verhulst	Brasil	2016, 2017, 2018, 2019, 2020	L'Oreal	Produtos e marketing	Sim	Product Manager	fev/91	mai/95	51	4,25	out/16	257	21,42
Ana Marta Horta Veloso	Brasil	2016	Light	Research, Financeiro	Sim	Research Department	ago/01	dez/01	4	0,33	abr/19	207	17,25
Anna Christina Ramos Saicali	Brasil	2016, 2018	B2W Digital	Tecnologia e RH	Sim	Diretora de Tecnologia e RH	jan/97	jan/04	84	7,00	jan/04	0	0,00
Antonio Filosa	Brasil	2020	Fiat Chrysler Automobiles	Strategic Planning, corporate PMO and Innovation, compras, mkt, logística, operações	Sim	Strategic Planning, corporate PMO and Innovation	ago/10	nov/11	15	1,25	abr/18	76	6,33
Besaliel Botelho	Brasil	2019, 2020	Robert Bosch Ltda.	Engenharia e desenvolvimento de produto e vendas técnicas	Sim				0	0,00		0	0,00

Carlo Zorzoli	Brasil	2017, 2018, 2019	Enel Brasil	Project development, sales	Sim	Project Development Manager	ago/99	fev/03	42	3,50	abr/16	158	13,17
Carlos Alberto Iwata Marinelli	Brasil	2016, 2017, 2018, 2019, 2020	Grupo Fleury	Novos Negócios, Estratégia, Inovação, Sustentabilidade e Operações de Negócios	Sim	Director of Strategy, Innovation and Sustainability	fev/10	ago/12	30	2,50	set/14	25	2,08
Carlos Pires	Brasil	2016	Rexam Beverage Can South America (BCSA)	Engenharia, qualidade, operações	Sim	Engineering/Quality	jan/92	dez/00	107	8,92	mai/17	197	16,42
Cesario Nakamura	Brasil	2018, 2019, 2020	Alelo	Produto, marketing	Sim	VP of Aquisition & Products	set/01	jun/06	57	4,75	nov/18	149	12,42
Chang Hoon Yoon	Brasil	2016, 2017	Samsung	Engineering	Não	Engineer			0	0,00		0	0,00
Charles Lenzi	Brasil	2018, 2019	Eletropaulo	Engenharia, operações, vendas, financeiro	Sim	Sales Engineer	mar/82	fev/86	47	3,92	abr/16	362	30,17
David Legher	Brasil	2016	Avon Cosméticos	Project, Marketing, operations, strategy, financial	Sim	M&A Project Director	jun/00	mai/01	11	0,92	nov/14	162	13,50
Domingos Bulus	Brasil	2016	White Martins Gases Industriais	Engenharia, produção	Sim	Engenheiro de campo recém formado							

Fernando Gonçalves Neto	Brasil	2016	Máquinas Agricolas Jacto	P&D	Não	Diretor de Pesquisa & Desenvolvimento		0	0,00		0	0,00	
Francisco Gomes Neto	Brasil	2019, 2020	Embraer	Engenharia, assistência técnica e comercial	Sim	Gerente Engenharia de Aplicação						0	0,00
Giancarlo Souza	Brasil	2017	Elektro Eletricidade e Serviços	Engineering	Sim	Executive Manager of Engineering, Planning and Operation	set/14	ago/17	35	2,92	ago/17	0	0,00
Gustavo Werneck	Brasil	2019, 2020	Gerdau	Engineering , IT	Sim	Engineering Manager	set/00	jul/07	82	6,83	jan/18	126	10,50
Henrique Braun	Brasil	2018, 2019, 2020	Coca-Cola Brasil	Inovação, cadeia de suprimentos, desenvolvimento de novos negócios, marketing, gerência geral, operações	Sim				0	0,00		0	0,00
José Borges Matias	Brasil	2017, 2018	Solvay	Engineering, compras	Sim	Engineering Project Manager	jan/85	dez/91	83	6,92	jan/14	265	22,08
Luis Salvador	Brasil	2019	Ecorodovias	Engenharia	Não	Gerente de engenharia	jul/04	abr/18	165	13,75	abr/18	0	0,00
Marc Reichardt	Brasil	2019, 2020	Bayer	Product, sales, operations	Sim	Product Manager	jul/96	mar/99	32	2,67	ago/18	233	19,42
Márcio Coelho	Brasil	2016	Johnson e Johnson	Produtos	Sim	Group Product Manager - Stationery	mar/99	fev/00	11	0,92	out/13	164	13,67

			Medical Devices										
Marcos Matias	Brasil	2019, 2020	Schneider Electric	Equipments, Project & Service	Sim	Equipments, Project & Service Director	jan/05	jan/10	60	5,00	set/18	104	8,67
Odair Renosto	Brasil	2016, 2017	Sotreq-Caterpillar	Finanças, planejamento de materiais, negócios, introdução de novos produtos, operações de produção e estratégia de produtos	Sim				0	0,00		0	0,00
Pablo Fava	Brasil	2020	Siemens Brasil	Produto, mkt, vendas	Sim	Gerente Sênior de Product	mar/97	mar/00	36	3,00	mar/20	240	20,00
Philipp Schiemer	Brasil	2016	Mercedes-Benz	Product, Marketing, Sales, IT	Sim	Head Of Product Management A-class	fev/98	dez/00	34	2,83	jun/13	150	12,50
Pietro Labriola	Brasil	2019, 2020	TIM	Project, operations, marketing	Sim	Head of PMO Network Separation	jan/13	nov/13	10	0,83	abr/19	65	5,42
Pius Hornstein	Brasil	2016	Sanofi	Product,Operações, estratégia, mkt,	Sim	Product Manager Cardiovascular	abr/97	ago/00	40	3,33	jan/15	173	14,42
Ramiro De La Cruz	Brasil	2016	Dow	P&D, RH, Qualidade e Comercial	Sim	Research and Development (R&D) Leader		0	0,00		0	0,00	

Renato Carvalho	Brasil	2019, 2020	Novartis	Project Manager, operations, Strategy , Sales, Finance and Pricing	Sim	Senior Manager, LatAm Project Manager & Master Black Belt	dez/09	dez/10	12	1,00	abr/19	100	8,33
Ricardo Perez Botelho	Brasil	2020	Energisa	Engenharia, tecnologia	Sim	Dir:Technology & Industry			0	0,00		0	0,00
Roberto Simões	Brasil	2020	Braskem	Engenharia, operações	Sim	Gerente de Materiais e Engenharia	ago/89	fev/93	42	3,50	jan/20	323	26,92
Rodrigo Santos	Brasil	2016, 2017	Monsanto do Brasil Ltda	Sales, marketing, strategy and technological development	Sim	Líder de Estratégia e Gestão de Produtos	jun/09	ago/11	26	2,17	jan/13	17	1,42
Sergio Pancini de Sá	Brasil	2018, 2019	Mahle	Engineering, consultancy	Sim	Gerente de engenharia	jan/92	jan/97	60	5,00	fev/17	241	20,08
Teresa Vernaglia	Brasil	2019, 2020	BRK Ambiental Participaçõe s S.A	Engenharia, operações, comercial, estratégia	Sim	Engineering & Operation Director	fev/88	jul/01	161	13,42	mai/17	190	15,83
Thierry Fournier	Brasil	2018, 2019, 2020	Saint-Gobain	Produto	Não	Gen Mgr:Construction Products	jan/05	jul/14	114	9,50	jan/19	54	4,50
Yoonie Joung	Brasil	2019	Samsung	P&D, vendas	Sim	Pesquisador sênior do centro de P&D	fev/92	abr/00	98	8,17	jan/19	225	18,75

Walter Dissinger	Brasil	2016	Votorantim Cimentos	Technology, Estratégia e Desenvolvimento de Negócios, mkt, engineering, sales, product	Sim	Director Strategic Business Development and Technology Styrenics	ago/91	fev/01	114	9,50	dez/13	154	12,83
Albert Bourla	Mundial	2019	Pfizer	Innovation, products, marketing	Sim	Group President, Pfizer Innovative Health	fev/16	dez/17	22	1,83	jan/19	12	1,00
Amar Hanspal	Mundial	2016	Autodesk	Product, Strategy and Marketing	Sim	Chief Product Officer and Senior Vice President, Products	jul/94	fev/17	271	22,58	fev/17	0	0,00
Andrew Anagnost	Mundial	2017, 2018	Autodesk	Engineering, Product Development, Strategy, Marketing, Design, consultancy	Sim	Vice President, Engineering Design and Simulation Products	jun/87	jan/10	271	22,58	jun/17	89	7,42
Anil Manibhai	Mundial	2016	Larsen & Toubro	Engineering	Não				0	0,00		0	0,00

Arvind Krishna	Mundial	2020	IBM	Research, manufacturing, products, technology	Sim	General Manager, Development and Manufacturing, Systems and Technology GroupDatabase/Warehouse Products	dez/90	dez/14	288	24,00	abr/20	63	5,25
Bernard Charlès	Mundial	2016, 2017, 2018	Dassault Systemes	R&D	Não	President of Strategy, Research & Development	set/82	dez/94	147	12,25	jan/95	1	0,08
Chris Kempczinski	Mundial	2019, 2020	McDonald's	Innovation, strategy, project, consultancy	Sim	Vice President, Global Strategy, Business Development and Innovation	jan/97	dez/17	251	20,92	jan/19	13	1,08
Francis deSouza	Mundial	2016, 2017, 2018	Illumina	Consultant, Product	Sim	President, Products and Services	jan/90	nov/13	286	23,83	jul/16	32	2,67
Gary Guthart	Mundial	2016, 2017, 2018	Intuitive Surgical	Product, engineering, operations	Sim	Senior VP:Product Operations	jan/02	fev/06	49	4,08	jan/10	47	3,92
Ginni Rometty	Mundial	2019	IBM	Engineer, sales	Sim	Systems Engineer	jan/81	ago/91	127	10,58	jan/12	245	20,42
Guillaume Faury	Mundial	2020	Airbus	R&D, engineer, commercial	Sim	EVP R&D	set/92	abr/13	247	20,58	abr/19	72	6,00

James E Meyer	Mundial	2016, 2017, 2018	Sirius XM Radio	Product Management, Operations, sales, mkt	Sim	Senior VP:Product Management	jan/92	dez/96	59	4,92	abr/13	196	16,33
Jean-Paul Agon	Mundial	2018	L'Oréal Group	Product, management	Sim				0	0,00		0	0,00
Jeffrey Leiden	Mundial	2016, 2017, 2018	Vertex Pharmaceuticals	Innovation	Sim	Chief Scientific Officer	jan/00	dez/06	83	6,92	jan/12	61	5,08
Joseph M. Hogan	Mundial	2018	Align Technology	Product, Mkt, Operations	Sim	Global Product Mgr:Cycoloy	jan/86	dez/90	59	4,92	jun/15	294	24,50
Kazuhiro Yoshizawa	Mundial	2019	NTT Docomo	Technology, strategy, research, HR, sales, mkt	Sim	Responsible for Mobile Society Research Institute	jun/12	jun/14	24	2,00	jun/16	24	2,00
Kevin Johnson	Mundial	2017, 2018	Starbucks	Engineer, Operations, sales, mkt	Sim	Systems Engineer	jan/86	set/92	80	6,67	abr/17	295	24,58
Koh Dong-Jin	Mundial	2019, 2020	Samsung Electronics	R&D	Não	Exec VP:Mobile R&D	jan/14	dez/15	23	1,92	out/17	22	1,83
Ludwig Hantson	Mundial	2017, 2018	Alexion Pharmaceuticals	R&D, mkt	Sim				0	0,00		0	0,00
Manabu Miyasaka	Mundial	2017, 2018	Yahoo Japan	Product	Não	Product Manager	jun/97	dez/01	54	4,50	jun/12	126	10,50
Martin Brudermüller	Mundial	2019	BASF	Technology, strategy, sales, marketing	Sim	Chairman-Mgmt Board/CEO/CTO (Chief Technology Officer)	jan/15	jan/18	36	3,00	jan/18	0	0,00

Mary Barra	Mundial	2019	General Motors	Product Development, HR, manufacturing engineering, operations, communications	Sim	Executive Vice President – Global Product Development	jan/90	jan/14	288	24,00	jan/14	0	0,00
Massimo Vian	Mundial	2016	Luxottica Group	Product, Operations, engineering, consultant	Sim	Industrial Engineering Director	jan/01	dez/06	71	5,92	out/14	94	7,83
Michael Mussallem	Mundial	2016, 2017, 2018	Edwards Lifesciences	Engineering and Product Development	Sim	Pres:Perfusion Products Bus	jan/89	dez/93	59	4,92	abr/00	76	6,33
Mike Roman	Mundial	2019, 2020	3M	Engineer, Operations, quality	Sim	Senior Design Engineer	out/88	mar/94	65	5,42	jul/18	292	24,33
Nico Delvaux	Mundial	2018	Assa Abloy	Technology, Sales and Marketing, quality	Sim	Business Area President Compressor Technique	jan/08	jun/17	113	9,42	mar/18	9	0,75
Ola Källenius	Mundial	2019	Daimler	Research, sales. Mkt, operations	Sim	Deutsche Internationale Nachwuchsgruppe	jan/93	dez/95	35	2,92	mai/19	281	23,42
Oliver Zipse	Mundial	2019	BMW	Innovation, product	Sim	Head:Brand & Product Strategies	jan/92	mar/13	254	21,17	ago/19	77	6,42

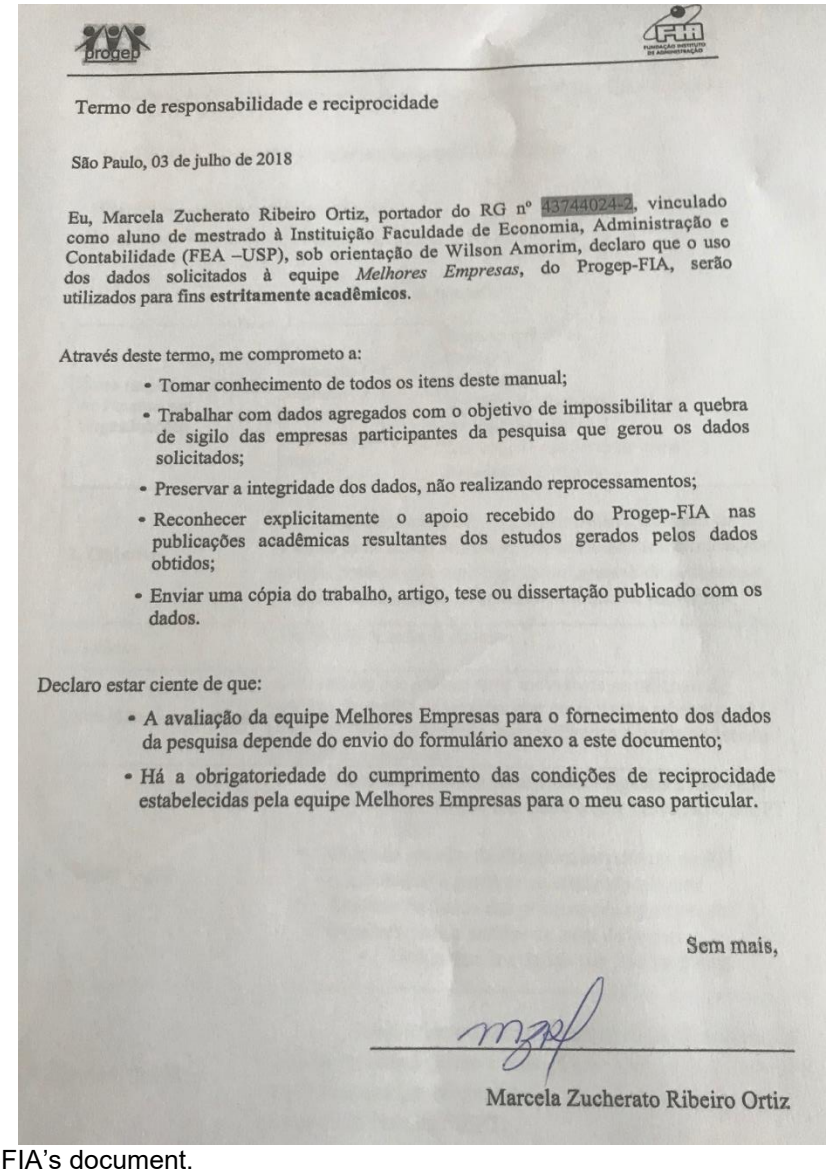
Peder Nielsen	Mundial	2016	Novozymes	R&D, Sales and Marketing	Sim	Executive Vice President - Head of the enzyme business	nov/84	dez/95	133	11,08	abr/13	208	17,33
Satya Nadella	Mundial	2019, 2020	Microsoft	R&D, technology	Sim	Senior VP:R&D Online Services	jan/07	dez/11	59	4,92	fev/14	26	2,17
Shantanu Narayen	Mundial	2016, 2017, 2018	Adobe Systems	Research, operations, marketing	Sim	Senior VP:Worldwide Product Dev	jan/98	mar/01	38	3,17	dez/07	81	6,75
Simon Segars	Mundial	2016	ARM Holdings	Sales, Engineering	Sim	VP Engineering	jan/86	dez/03	215	17,92	jul/13	115	9,58
Sundar Pichai	Mundial	2018, 2019, 2020	Alphabet	Product, consultant	Sim	Senior VP:Products	jan/04	out/15	141	11,75	out/15	0	0,00
Vasant Narasimhan	Mundial	2020	Novartis	Drug Development, mkt	Sim	Global Head of Drug Development	fev/16	jan/18	23	1,92	fev/18	1	0,08
Martin Lundstedt	Mundial	2020	Volvo	Engineer, sales, production	Sim	Production Engineer	jan/92	dez/01	119	9,92	09/dez	240	20,00

APPENDIX D – GPTW COMPLEMENTARY DATA

The talent management and retention for innovation quantitative study, presented on Section 4.3 and 5.3, intended to identify which talent management practices were used by innovative Brazilian companies and if these practices differed from those used in traditional firms. Thus, a comparative study about how innovative and traditional Brazilian companies promote talent management practices was performed using 2017's GPTW database.

The survey's database was formally requested to PROGEP-FIA. The term of responsibility and reciprocity in the use of the GPTW database and the survey data request form are shown in Figures D.1, D.2, and D.3.

Figure D.1: Signed term of responsibility and reciprocity in the use of the GPTW database.



progep

Termo de responsabilidade e reciprocidade

São Paulo, 03 de julho de 2018

Eu, Marcela Zucherato Ribeiro Ortiz, portador do RG nº 43744024-2, vinculado como aluno de mestrado à Instituição Faculdade de Economia, Administração e Contabilidade (FEA –USP), sob orientação de Wilson Amorim, declaro que o uso dos dados solicitados à equipe *Melhores Empresas*, do Progep-FIA, serão utilizados para fins **estritamente acadêmicos**.

Através deste termo, me comprometo a:

- Tomar conhecimento de todos os itens deste manual;
- Trabalhar com dados agregados com o objetivo de impossibilitar a quebra de sigilo das empresas participantes da pesquisa que gerou os dados solicitados;
- Preservar a integridade dos dados, não realizando reprocessamentos;
- Reconhecer explicitamente o apoio recebido do Progep-FIA nas publicações acadêmicas resultantes dos estudos gerados pelos dados obtidos;
- Enviar uma cópia do trabalho, artigo, tese ou dissertação publicado com os dados.

Declaro estar ciente de que:

- A avaliação da equipe Melhores Empresas para o fornecimento dos dados da pesquisa depende do envio do formulário anexo a este documento;
- Há a obrigatoriedade do cumprimento das condições de reciprocidade estabelecidas pela equipe Melhores Empresas para o meu caso particular.

Sem mais,

Marcela Zucherato Ribeiro Ortiz

Source: PROGEP-FIA's document.

Figure D.1: Term of responsibility and reciprocity in the use of the GPTW database.

Termo de responsabilidade e reciprocidade

São Paulo, 03 de julho de 2018

Eu, Marcela Zucherato Ribeiro Ortiz, portador do RG nº 43744024-2, vinculado como aluno de mestrado à Instituição Faculdade de Economia, Administração e Contabilidade (FEA –USP), sob orientação de Wilson Amorim, declaro que o uso dos dados solicitados à equipe *Melhores Empresas*, do Progep-FIA, serão utilizados para fins **estritamente acadêmicos**.

Através deste termo, me comprometo a:

- Tomar conhecimento de todos os itens deste manual;
- Trabalhar com dados agregados com o objetivo de impossibilitar a quebra de sigilo das empresas participantes da pesquisa que gerou os dados solicitados;
- Preservar a integridade dos dados, não realizando reprocessamentos;
- Reconhecer explicitamente o apoio recebido do Progep-FIA nas publicações acadêmicas resultantes dos estudos gerados pelos dados obtidos;
- Enviar uma cópia do trabalho, artigo, tese ou dissertação publicado com os dados.

Declaro estar ciente de que:

- A avaliação da equipe Melhores Empresas para o fornecimento dos dados da pesquisa depende do envio do formulário anexo a este documento;
- Há a obrigatoriedade do cumprimento das condições de reciprocidade estabelecidas pela equipe Melhores Empresas para o meu caso particular.

Sem mais,

Marcela Zucherato Ribeiro Ortiz

Source: PROGEP-FIA's document.

Figure D.3: Survey data request document.

4. Formulário de solicitação de dados da pesquisa Melhores Empresas

Nome completo do solicitante: Marcela Zucherato Ribeiro Ortiz

(Preenchimento pela equipe de pesquisa)
Prazo estimado para envio dos dados: [__/__/____]

Delineamento da pesquisa

Área de estudo: Gestão de Pessoas em Organizações	**Curso:** Graduação ( ) Mestrado (x) Doutorado ( ) Especialização ( ) MBA ( )	**Tipo de trabalho:** Tese ( ) Dissertação ( ) Trabalho de disciplina (x) Artigo acadêmico ( ) Trabalho de conclusão de curso ( ) Apresentação de aula ( )
1. Objetivo	Analisar como as práticas de gestão e retenção de talentos estão sendo utilizadas em empresas reconhecidas por possuir práticas efetivas de gestão de pessoas de setores que possuem um histórico de desenvolvimento de inovações.	
2. Tema	Gestão e Retenção de Talentos.	
3. Problema da pesquisa	As empresas dos setores mais inovativos se utilizam de práticas de gestão de pessoas que propiciam a retenção de talentos? Quais as práticas mais utilizadas e quais poderiam ser melhor exploradas?	

4. Metodologia	• Seleção dos ramos de atividades ligados à inovação
	  • Intersecção das listas Valor Inovação e MEPT 2017
	• Obter da revisão da literatura as práticas de RH relacionadas à gestão e retenção de talentos
	• Analisar os dados das práticas provenientes da literatura para a análise da base de dados
	  • Utilização dos dados das 150 melhores	

5. Plano de análise	Analisar se existem diferenças entre as práticas de RH relacionadas à gestão e retenção de talentos desenvolvidas pelas empresas que se consideram inovadoras e as demais empresas da base da MEPT.	

Source: PROGEP-FIA's document.

The image of the requisition worksheet for the selected questions is shown in Figure D.4 and the raw data in Table D.1.

Figure D.4: Selected questions from database.

Categoria	Código	Questão	Itens	
Gestão Estratégica e Objetivos	V429	A empresa define metas de maneira formal e estruturada?	Não, a empresa não define metas de maneira formal ou estruturada	
	V431		Sim, conforme abaixo:	São metas derivadas da estratégia
	V435			São metas predominantemente coletivas
	V436			São metas predominantemente individuais
	V437			Existem metas específicas compartilhadas entre diferentes áreas
	V439			A empresa analisa a consistência entre os indicadores e metas de diferentes áreas
	V443			Os responsáveis pela realização das metas participam e influenciam em sua definição
Gestão do Reconhecimento e Recompensa	V631	A empresa possui um programa formal e estruturado de remuneração?	Sim, conforme abaixo:	A empresa tem um posicionamento definido e sabe como remunera em relação ao mercado (ex. posicionamento em 1º quartil; posicionamento em mediana; etc)
	V634			Utiliza instrumentos formais de avaliação (por exemplo, desempenho, cumprimento de metas, competências, CHA) que são utilizados como parâmetro para decisões de evolução salarial dos empregados
	V638			Os aumentos salariais por mérito (progressão) podem acontecer somente em períodos previamente definidos
	V640			Os aumentos salariais por mérito (progressão) podem acontecer em qualquer período
	V642			A empresa tem estabelecido um percentual máximo para aumento remuneratório em caso de mérito ou promoção
	V723	A empresa possui práticas de remuneração variável?	Assinale as práticas de remuneração variável de curto prazo:	Participação nos Lucros ou Resultados<>Diretores
	V724			Participação nos Lucros ou Resultados<>Gerentes e Supervisores
	V725			Participação nos Lucros ou Resultados<>Administrativos, Técnicos e Operacionais

Categoria	Código	Questão	Itens	
Gestão do Reconhecimento e Recompensa	V727	A empresa possui práticas de remuneração variável?	Assinale as práticas de remuneração variável de curto prazo:	Bônus Executivo<>Diretores
	V728			Bônus Executivo<>Gerentes e Supervisores
	V729			Bônus Executivo<>Administrativos, Técnicos e Operacionais
	V731			Comissão ou premiação<>Diretores
	V732			Comissão ou premiação<>Gerentes e Supervisores
	V733			Comissão ou premiação<>Administrativos, Técnicos e Operacionais
	V735			Bônus de contratação<>Diretores
	V736			Bônus de contratação<>Gerentes e Supervisores
	V737			Bônus de contratação<>Administrativos, Técnicos e Operacionais
	V741		Assinale as práticas de remuneração variável de longo prazo:	Planos de distribuição / concessão de Ações aos Empregados<>Diretores
	V742			Planos de distribuição / concessão de Ações aos Empregados<>Gerentes e Supervisores
	V743			Planos de distribuição / concessão de Ações aos Empregados<>Administrativos, Técnicos e Operacionais
	V745			Opções de compra de ações<>Diretores
	V746			Opções de compra de ações<>Gerentes e Supervisores
	V747			Opções de compra de ações<>Administrativos, Técnicos e Operacionais
	V753			Bônus diferido<>Diretores
	V754			Bônus diferido<>Gerentes e Supervisores
	V755			Bônus diferido<>Administrativos, Técnicos e Operacionais
	V757			Bônus de retenção<>Diretores
	V758			Bônus de retenção<>Gerentes e Supervisores
	V759			Bônus de retenção<>Administrativos, Técnicos e Operacionais

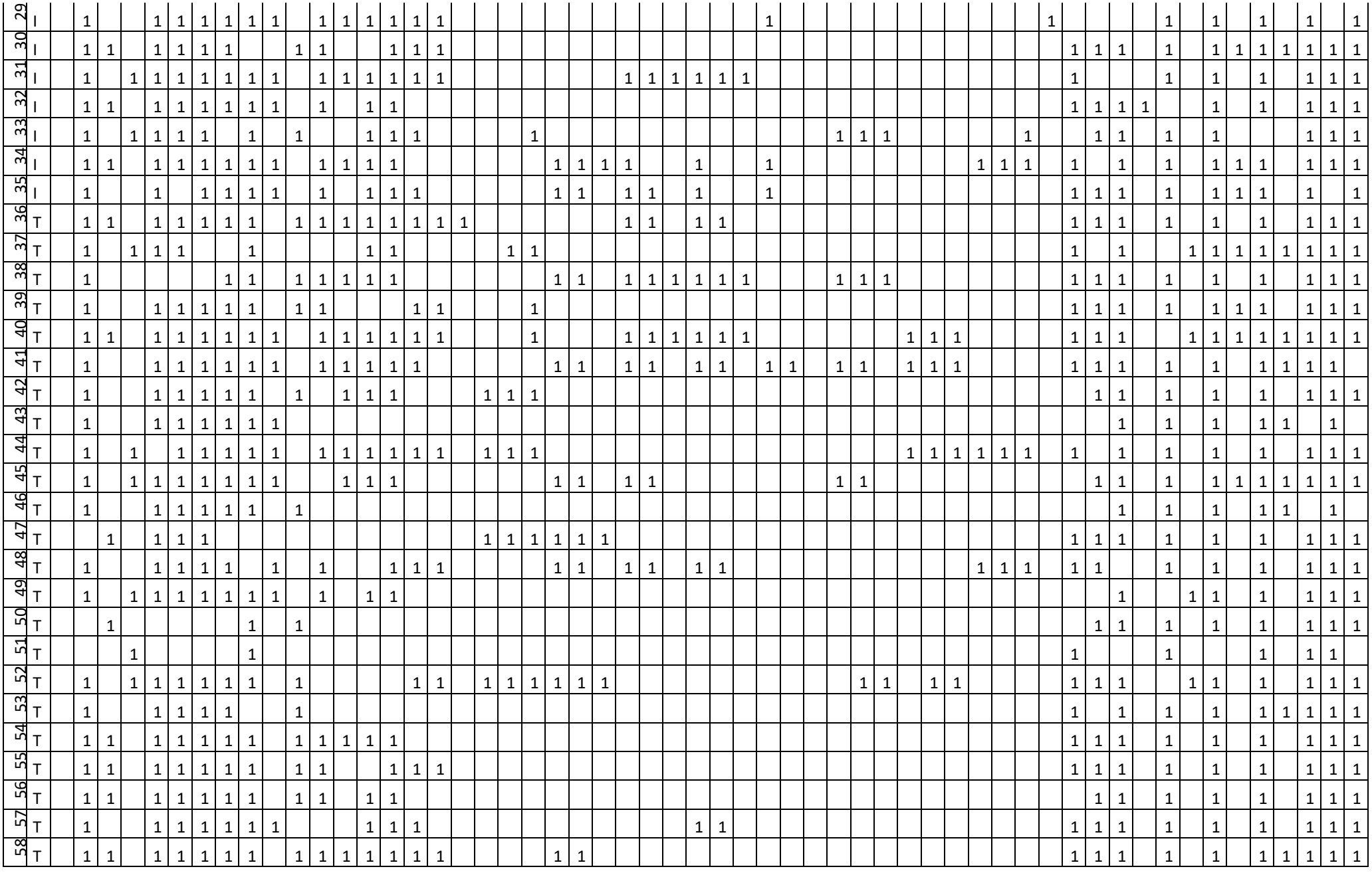
Categoria	Código	Questão	Itens	
Gestão do Reconhecimento e Recompensa	V763	A empresa possui práticas de remuneração variável?	Assinale as outras práticas de remuneração variável:	Premiações eventuais (Spot awards)<>Diretores
	V764			Premiações eventuais (Spot awards)<>Gerentes e Supervisores
	V765			Premiações eventuais (Spot awards)<>Administrativos, Técnicos e Operacionais
	V767			'Mérito variável' (Lump Sum)<>Diretores
	V768			'Mérito variável' (Lump Sum)<>Gerentes e Supervisores
	V769			'Mérito variável' (Lump Sum)<>Administrativos, Técnicos e Operacionais
	V772	A empresa adota práticas formais de reconhecimento não-financeiro?	Não, a empresa não adota práticas de reconhecimento não-financeiro	
	V774		Sim, conforme abaixo:	O desenvolvimento de competências é reconhecido (ex.: indicações para novos projetos ou para experiências internacionais; envio de e-mails ou cartas de parabenização da alta direção da empresa)
	V776			Os destaques de performance dos empregados são premiados com exposição pública (ex.: notícias nos canais de comunicação da empresa; exposição em eventos de premiação de empregados que se destacaram na organização)
	V778			Os empregados são convidados a representar a empresa em eventos externos (ex.: convites para representar a empresa em feiras e eventos profissionais; convites para ministrar palestras sobre a empresa em universidades ou outras instituições)

Categoria	Código	Questão	Itens	
Gestão de Carreira	V856	Existem critérios e regras formais definidos para tomada de decisão sobre promoções (mudança de cargo) na empresa?	Não, não existem critérios e regras formais definidos para tomada de decisão sobre promoções (mudança de cargo) na empresa	
	V858		Sim, conforme abaixo:	As decisões sobre promoção são tomadas pelo superior imediato
	V860			As decisões sobre promoção são tomadas pelo superior imediato com apoio formal de RH
	V862			As decisões sobre promoção são tomadas por um comitê de gestores
	V892	A empresa adota um processo formal de avaliação de desempenho de seus empregados não-gestores?		O empregado é avaliado pelo seu chefe
	V893			O empregado é avaliado pelo superior do seu chefe
	V894			O empregado realiza sua auto-avaliação
	V895			O empregado é avaliado pelos seus pares
	V896			O resultado da avaliação é usado para decisões a respeito de remuneração
	V898			O resultado da avaliação é usado para decisões a respeito de treinamento e desenvolvimento
	V900			O resultado da avaliação é usado para decisões a respeito de movimentação de carreira

Source: PROGEP-FIA's document.

Table D.1: 2017's Brazilian GPTW raw data.

Código	Classificação	V429	V431	V435	V436	V437	V439	V443	V631	V634	V638	V640	V642	V723	V724	V725	V727	V728	V729	V731	V732	V733	V735	V736	V737	V741	V742	V743	V745	V746	V747	V753	V754	V755	V757	V758	V759	V763	V764	V765	V767	V768	V769	V772	V774	V776	V778	V858	V860	V862	V892	V893	V894	V895	V896	V898	V900
1	–		1	1		1	1	1	1	1	1		1	1	1	1	1									1			1											1	1	1		1		1		1	1	1	1	1
2	–		1	1		1	1	1	1	1	1			1	1	1	1	1				1																						1	1	1		1		1	1	1	1	1	1	1
3	–		1		1	1	1	1	1	1		1	1	1	1	1										1	1	1	1	1	1							1	1					1	1	1		1		1	1	1	1	1	1	1
4	–		1	1		1	1	1	1	1	1		1	1	1	1													1														1				1				1			1	1	1
5	–		1		1	1	1	1	1	1		1	1			1	1	1																										1		1			1	1		1		1	1	1
6	–		1		1	1	1	1	1		1		1	1	1	1	1				1		1			1			1	1	1													1	1	1			1	1		1		1	1	1
7	–		1		1	1	1	1	1	1	1		1	1	1	1																												1					1	1		1		1	1	1
8	–		1			1	1	1	1	1		1	1				1	1		1	1	1	1	1											1	1		1	1	1	1	1			1	1	1		1		1		1	1	1	1	1
9	–		1	1		1	1	1	1	1		1		1	1	1							1	1																				1	1	1		1		1	1	1		1	1	1
10	–		1	1		1	1	1	1	1		1	1	1	1	1	1									1			1														1					1		1		1	1	1	1	1
11	–		1		1	1	1	1	1	1		1		1	1	1										1	1																		1	1	1		1		1		1	1	1
12	–		1	1		1	1	1	1	1		1	1																1																	1	1		1				1	1	1
13	–		1	1		1	1	1		1	1		1	1	1		1	1				1	1						1				1															1	1		1		1	1	1
14	–		1		1	1	1	1	1	1	1		1	1	1	1																																	1	1		1	1	1	1	
15	–		1		1	1	1	1	1	1	1		1	1	1	1	1	1					1	1		1			1	1		1			1												1		1	1	1	1	1	1
16	–		1	1		1	1	1	1		1		1	1	1	1	1	1				1																									1	1		1		1		1	1	1	1	1
17	–		1	1		1		1	1	1		1	1			1	1	1					1	1		1	1		1	1					1	1		1	1	1			1		1	1	1		1		1	1	1	1	1
18	–		1		1		1	1	1	1		1	1	1	1	1						1				1	1		1	1		1	1														1		1			1	1		1	1	1	1
19	–		1	1		1		1	1	1	1		1			1	1	1								1																					1	1			1		1	1	1		1	1	1
20	–		1	1		1	1		1	1		1	1	1	1	1	1	1	1				1	1	1							1														1	1	1			1	1		1		1	1	1
21	–		1	1		1	1	1	1	1	1			1	1	1	1	1					1	1											1	1												1	1	1		1		1		1	1	1
22	–		1		1	1	1	1	1	1			1	1	1	1							1	1	1																					1	1			1		1	1	1	1	1		1
23	–		1	1		1		1	1			1	1	1			1	1								1			1																	1	1	1			1	1	1	1		1	1	1
24	–		1	1		1	1	1	1	1	1		1	1	1	1	1	1			1		1	1										1	1												1	1	1			1	1	1	1		1	1	1
25	–		1			1	1	1	1	1		1			1	1	1									1																				1	1	1		1		1	1	1		1	1	1
26	–		1		1	1	1	1	1	1	1		1			1	1	1	1				1	1	1																			1				1		1	1	1	1	1	1	1
27	–		1						1					1	1	1	1																											1				1		1	1	1	1	1	1	1
28	–		1	1		1	1	1	1			1	1			1	1	1																													1	1	1		1		1		1	1	1	1	1



59	T			1					1			1		1	1	1							1	1	1																							1	1			1	1		1	1		1	1
60	T		1	1		1	1	1	1	1		1	1	1	1	1	1	1			1	1																1	1	1	1	1	1		1	1	1		1		1		1			1	1
61	T		1	1		1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1				1	1		1	1		1	1		1	1				1			1		1	1	1	1			1	1	1	1	1	1	1
62	T		1	1		1		1	1	1		1	1	1	1	1	1	1				1																								1	1			1	1		1		1	1	1
63	T		1			1	1		1			1	1	1	1	1																												1					1		1		1			1	
64	T		1	1		1	1	1	1	1		1		1																															1	1	1			1	1		1		1	1	1
65	T		1	1		1	1	1	1	1		1	1		1	1	1																														1			1	1		1			1	1
66	T		1	1		1	1	1	1	1		1	1		1	1																													1	1			1		1		1			1	1
67	T		1	1		1	1	1	1	1		1	1	1	1	1	1	1																											1		1		1		1				1	1	1
68	T		1	1		1	1	1	1	1		1	1		1	1		1				1																							1	1	1			1	1	1	1		1	1	1
69	T		1	1		1	1	1	1	1	1		1	1	1	1																															1		1		1		1		1	1	1
70	T		1				1	1	1	1		1	1		1	1	1																													1				1	1		1		1	1	1
71	T			1		1			1	1		1																																			1		1		1		1		1	1	1
72	T		1		1				1	1	1			1	1	1	1			1	1	1	1	1		1	1								1	1	1	1	1	1					1				1		1	1			1	1	1
73	T		1	1		1	1	1	1	1	1																																1		1	1	1		1		1		1		1	1	1
74	T		1		1	1	1	1	1	1	1		1			1	1	1				1				1	1		1	1																1				1	1		1		1	1	1
75	T		1		1	1	1	1	1	1		1	1	1	1	1					1																										1			1	1				1	1	1
76	T		1			1	1	1	1	1	1		1			1	1	1																									1		1	1	1		1		1	1	1	1	1	1	1
77	T		1				1		1	1			1	1	1	1						1																							1	1			1		1				1	1	1
78	T		1		1	1	1	1	1	1		1	1	1	1	1				1	1	1																								1	1		1		1		1		1	1	1
79	T		1				1	1	1	1		1		1	1	1																														1			1		1				1	1	1
80	T		1	1		1	1	1	1	1	1			1	1	1	1																													1			1		1				1	1	1
81	T		1		1	1	1	1	1			1		1	1	1					1	1	1	1																					1	1	1		1		1		1		1	1	1
82	T		1	1					1	1		1	1																																	1	1		1		1		1		1	1	
83	T		1	1		1	1	1	1	1	1		1	1	1	1	1	1					1	1					1	1	1				1			1	1	1	1	1	1		1	1	1		1		1	1	1	1	1	1	1
84	T		1		1	1	1	1	1	1		1	1	1	1	1				1	1	1	1	1	1	1			1						1	1	1								1	1	1			1	1		1		1	1	1
85	T		1		1	1	1	1		1		1								1	1	1																1	1	1					1	1	1			1	1		1	1	1	1	1
86	T		1			1		1	1	1	1		1	1	1	1							1	1											1	1									1	1			1		1	1	1		1	1	1
87	T		1	1		1	1	1	1	1		1			1	1																														1	1		1		1		1			1	1
88	T		1	1		1	1	1	1	1		1	1																																	1	1		1		1		1		1	1	1

89	T		1						1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1				1	1	1	1	1	1	1	1	1		1	1	1		1		1	1			1	1	1
90	T		1	1		1	1	1	1	1	1		1	1	1	1																															1		1		1		1	1	1	1	1
91	T		1	1		1	1	1	1	1		1	1	1	1	1	1				1																								1	1	1			1	1	1	1	1	1	1	1
92	T		1						1		1			1	1	1	1																												1	1	1		1		1	1	1		1	1	1
93	T		1	1		1			1				1																																	1			1		1		1		1	1	1
94	T		1			1	1	1	1	1		1	1	1	1	1																													1	1	1			1	1		1	1		1	
95	T		1			1	1	1	1																										1	1	1									1	1		1		1		1	1		1	
96	T		1																		1	1																								1	1			1	1		1				
97	T		1			1	1	1	1	1		1	1	1	1	1	1	1					1	1		1									1	1					1	1			1	1	1		1		1		1		1	1	1
98	T		1	1			1	1	1				1																																	1	1		1		1		1				1
99	T		1		1	1	1	1	1	1		1	1				1	1				1																							1	1	1		1		1		1		1	1	1
100	T		1		1			1	1			1		1	1	1					1		1	1																						1			1		1		1		1	1	1
101	T		1	1		1	1	1	1			1	1		1	1																				1	1								1	1	1		1		1				1	1	1
102	T		1	1		1	1	1	1	1	1		1	1	1	1										1			1																1	1	1		1		1		1	1	1	1	1
103	T		1	1		1	1	1	1	1	1		1																																1	1	1		1		1	1		1	1	1	
104	T		1	1		1	1	1	1	1	1			1	1							1																							1	1	1		1		1		1			1	1
105	T		1	1		1	1	1	1			1		1	1	1				1	1	1																							1	1	1				1		1			1	
106	T		1			1	1	1		1		1	1	1	1	1	1	1				1																						1					1		1				1	1	1
107	T		1	1					1	1	1		1	1	1	1																													1		1	1			1		1		1	1	1
108	T		1				1			1		1	1		1	1					1		1	1	1														1	1		1	1	1					1		1		1		1	1	1
109	T		1	1		1	1	1	1	1		1	1	1	1	1						1																		1						1	1		1		1					1	1
110	T				1				1																														1					1					1		1					1	1
111	T		1	1		1	1	1	1	1	1		1		1	1	1	1								1	1														1	1	1		1	1			1		1		1		1	1	1
112	T		1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1																							1	1	1		1		1		1		1	1	1
113	T		1	1					1	1		1		1	1	1																													1	1	1			1	1	1	1	1	1	1	1

114	T		1	1		1	1		1	1	1		1	1	1	1						1																								1			1		1		1		1	1	1
115	T		1						1	1	1		1		1	1	1																												1	1	1		1		1				1		1
116	T		1	1		1	1	1		1		1		1	1	1	1	1			1	1										1													1	1	1		1		1		1			1	1
117	T		1	1		1	1	1		1		1		1	1	1																												1					1		1		1	1	1	1	1
118	T		1	1		1	1	1	1	1	1		1			1	1	1					1	1		1	1												1	1	1	1	1		1	1	1		1		1		1	1	1	1	1
119	T		1	1		1	1	1						1	1	1						1																							1	1	1			1							
120	T		1			1	1	1	1	1	1			1	1	1													1	1															1	1	1		1		1		1		1	1	1
121	T		1	1				1		1	1		1	1	1	1	1									1						1													1	1				1	1	1	1		1	1	1
122	T		1	1		1		1		1		1		1	1	1																														1				1							
123	T		1		1		1	1	1	1	1			1	1	1	1	1	1						1				1	1															1		1			1	1		1	1	1	1	
124	T		1	1		1	1	1	1	1		1				1	1	1																											1					1	1		1		1	1	1
125	T		1		1	1	1	1	1	1		1	1	1	1	1	1															1													1	1	1		1		1		1		1	1	1
126	T		1	1		1	1	1	1			1	1																																1	1	1		1		1					1	1
127	T		1	1		1	1	1	1	1		1	1																																1		1			1	1		1	1	1	1	1
128	T		1	1											1	1	1															1												1					1		1	1	1	1	1	1	1
129	T		1		1	1		1	1	1		1	1	1	1	1																												1					1		1		1		1		
130	T		1			1		1		1		1		1	1	1																														1			1		1		1			1	1
131	T		1		1	1	1	1	1	1	1		1	1	1	1										1			1									1	1	1					1	1	1		1		1		1		1	1	1
132	T		1	1		1	1	1	1	1		1	1	1	1	1	1	1																											1	1	1		1		1				1	1	1
133	T		1		1	1		1	1	1		1	1	1	1	1	1																												1	1	1			1	1	1	1		1	1	1
134	T		1		1	1	1	1	1	1	1		1	1	1	1							1	1																					1	1			1		1				1		1
135	T		1	1		1	1	1		1	1		1																															1						1	1		1		1	1	
136	T		1	1			1	1	1		1		1	1	1	1	1				1																							1					1		1		1			1	1

137	T		1		1	1	1	1	1	1		1	1	1	1	1	1	1								1			1							1									1	1	1			1	1		1		1	1	1
138	T		1	1		1	1	1		1	1		1	1	1	1																														1			1		1		1		1	1	1
139	T		1		1		1	1	1	1		1	1								1																								1	1	1		1		1	1	1	1	1	1	1
140	T		1	1		1	1	1	1	1		1	1	1	1	1																														1			1		1		1			1	
141	T		1	1				1	1	1	1					1	1	1					1	1					1	1	1	1														1	1		1		1	1	1		1	1	1
142	T		1						1	1	1		1		1	1	1	1					1			1			1																1	1	1		1		1				1	1	1
143	T		1						1			1	1	1			1	1	1				1	1																					1	1	1		1		1		1		1	1	1
144	T		1			1		1	1	1		1		1	1	1				1	1	1				1	1	1												1	1	1		1		1		1		1		1		1	1	1
145	T		1	1		1	1	1	1	1		1	1		1	1																											1					1		1		1		1	1	1
146	T		1		1	1	1	1		1		1		1	1	1	1						1	1	1																					1	1			1	1	1	1		1		
147	T		1	1		1	1	1	1	1	1				1	1	1	1																											1	1	1		1		1	1			1	1	1
148	T		1	1		1	1	1													1	1																							1	1	1		1		1		1			1	1
149	T		1	1		1	1	1		1	1		1	1	1	1																											1					1		1		1		1	1	1
150	T		1	1		1	1		1	1		1	1		1	1		1			1																									1	1		1		1					1	1

Source: PROGEP-FIA's document.

The results of all practices analyzed in the study detailed in Section 5.3 are presented in Table D.2.

Table D.2: Talent management practices in innovative and vs. traditional companies.

	Practices	**Use in innovative firms**	**Difference from traditional firms**
Evaluation - Goals	There are shared goals with different areas	**94%**	**18%**
Evaluation - Goals	Employee participation in the definition of goals	**94%**	**15%**
Evaluation - Goals	Predominantly individual	34%	**12%**
Evaluation - Goals	Analyzes goals consistency with indicators	**86%**	**10%**
Evaluation - Goals	Goals derived from the strategy	**100%**	5%
Evaluation - Goals	Predominantly collective	51%	-2%
Evaluation - Outcomes	Remuneration	**100%**	**22%**
Evaluation - Outcomes	Career development	**97%**	**13%**
Evaluation - Outcomes	Training and development	**91%**	-2%
Evaluation - Participants	Employees are evaluated by the chief of their superior	46%	**27%**
Evaluation - Participants	Employees are evaluated by their peers	40%	**17%**
Evaluation - Participants	Self-evaluation	**91%**	9%
Evaluation - Participants	Employees are evaluated by their immediate superior	**97%**	0%
Evaluation + Rewards	Mutual use of team-based evaluation and performance reward - Directors	**80%**	**36%**
Evaluation + Rewards	Mutual use of team-based evaluation and performance reward - Managers and supervisors	69%	**26%**
Evaluation + Rewards	Mutual use of team-based evaluation and performance reward - Administrative, technical and operational	37%	4%

Development - Decision-making	Managerial comitee	26%	2%
Development - Decision-making	Immediate superior	3%	1%
Development - Decision-making	Immediate superior with the HR formal support	71%	-2%
Rewards - Eventual rewards	Lump sum - Managers and supervisors	11%	2%
Rewards - Eventual rewards	Lump sum - Administrative, technical and operational	11%	1%
Rewards - Eventual rewards	Lump sum - Directors	9%	1%
Rewards - Eventual rewards	Spot awards - Managers and supervisors	9%	-2%
Rewards - Eventual rewards	Spot awards - Directors	6%	-2%
Rewards - Eventual rewards	Spot awards - Administrative, technical and operational	9%	-3%
Rewards - Exclusive use	Use extrinsic rewards exclusively for executive positions - Directors	**91%**	**34%**
Rewards - Exclusive use	Use extrinsic rewards exclusively for executive positions - Managers and supervisors	77%	**20%**
Rewards - Exclusive use	Use extrinsic rewards exclusively for executive positions - Administrative, technical and operational	43%	0%
Rewards - Long-term rewards	Share distribution - Directors	40%	**24%**
Rewards - Long-term rewards	Stock options - Directors	40%	**24%**
Rewards - Long-term rewards	Deferred bonus - Directors	17%	11%
Rewards - Long-term rewards	Share distribution - Managers and supervisors	17%	6%
Rewards - Long-term rewards	Stock options - Managers and supervisors	17%	6%

Rewards - Long-term rewards	Stock options - Administrative, technical and operational	9%	5%
Rewards - Long-term rewards	Share distribution - Administrative, technical and operational	8%	4%
Rewards - Long-term rewards	Deferred bonus - Managers and supervisors	6%	4%
Rewards - Long-term rewards	Deferred bonus - Administrative, technical and operational	0%	0%
Rewards - Salary	Establishes a maximum percentage for salary increases based on merit or promotion	**80%**	**17%**
Rewards - Salary	Merit salary increases happen at pre-defined periods	51%	16%
Rewards - Salary	The company remunerates in relation to the market	**94%**	**11%**
Rewards - Salary	Uses formal assessment tools for incentive purposes	**83%**	1%
Rewards - Salary	Merit salary increases happen at any time	43%	-12%
Rewards - Short-term rewards	Executive bonus - Directors	69%	**29%**
Rewards - Short-term rewards	Executive bonus - Managers and supervisors	49%	**20%**
Rewards - Short-term rewards	Hiring bonus - Directors	37%	17%
Rewards - Short-term rewards	Profit sharing - Administrative, technical and operational	**89%**	**13%**
Rewards - Short-term rewards	Hiring bonus - Managers and supervisors	31%	12%
Rewards - Short-term rewards	Profit sharing - Directors	66%	9%
Rewards - Short-term rewards	Profit sharing - Managers and supervisors	74%	4%
Rewards - Short-term rewards	Hiring bonus - Administrative, technical and operational	11%	4%

Rewards - Short-term rewards	Executive bonus - Administrative, technical and operational	6%	2%
Rewards - Short-term rewards	Commission or award - Directors	3%	-8%
Rewards - Short-term rewards	Commission or award - Administrative, technical and operational	17%	-10%
Rewards - Short-term rewards	Commission or award - Managers and supervisors	9%	-14%

Source: designed by the authors.

APPENDIX E – INCREMENTAL CASES

Case D

Empresa química

Entrevistados:

Gerente de gestão da inovação e inovação aberta

Gerente do laboratório de desenvolvimento e inovação de uma unidade de negócios

Estrutura

- Área de inovação está alocada na VP de marketing e inovação – *inovação x comercial. Focos concorrentes, se a inovação for estratégica. Indicativo de inovação incremental.*
- Ambos estão no nível L4
    - L1 – Presidente
    - L2 – VP
    - L3 – Diretor
- Diretoria de inovação: uma diretora, um gerente e 3 analistas
- Diretoria da unidade de negócios: uma diretora e 3 gerentes.
    - Gerente do laboratório de desenvolvimento e inovação possui 9 subordinados

Projetos

- Área de inovação atua como orquestradora e apoia as áreas de desenvolvimento de produtos das unidades de negócios.
- Projetos com foco no cliente e tendências de mercado – *inovação incremental, mesmo mercado e mesmos negócios*
- TLR de 1 a 5 com foco na próxima década

- Gestão por stage-gates e PMO
- Projetos descontinuados: conhecimento e aprendizados como principais saídos do projeto; documentação formal dos aprendizados. Não há culpados.

Comitês de inovação

- Comitês de projetos e de *cross segment* – participantes são gerentes (L4) – *autonomia de gerentes*
- Comitê de pipeline & budget – participam os VPs de inovação e marketing, das unidades de negócios, e de estratégia e vendas, além os diretores (L2, L3) – *envolvimento dos executivos com os projetos de inovação, forte influência da área comercial*
- *Não há interlocução entre gerentes ligados à inovação com os executivos, inibindo a visibilidade*

Avaliação

- Estabelecimento de metas junto com o líder direto
- 3 níveis de entrega de curto, médio e longo prazo
- L3 tem meta setorial que é cascateada e envolve:
    - Números dentro do negócio
    - Atender o orçamento
    - Lançamentos – *indicativo de projetos de inovação de curto prazo*
    - Meta técnica - exemplo: nova plataforma de divulgação do portfólio
- Meta individual, exemplos:
    - Promover a plataforma tecnológica
    - Fazer com que a parceria seja concretizada
- Avaliação de competências 360° (líder, pares e subordinados)

- Líder leva os potenciais talentos para comitê de pessoas – *inovação decide e entrega ao RH*
- Feedback formal e acompanhado de um PDI via sistema

Incentivos

- Innovation awards – não deriva da avaliação
- PLR
- Reconhecimento informal
- Cursos de inglês
- Programa de mérito – condecoração e upgrade no cargo ou salário

Case E

Empresa de autopeças

Entrevistado: Gerente de gestão da inovação tecnológica

Estrutura

Responde ao diretor global de engenharia e inovação de uma unidade de negócios

Atua em uma unidade de negócios e no corporativo – *distante da alta gestão*

Projetos

- Inovação aberta
- Propriedade intelectual
- Gestão da inovação (caráter de P&D/tecnologia)
    - Ações internas
    - Ferramentas de gestão
    - Projetos com duração de 1 a 2 anos

- Recentemente criaram um programa de inovação
    - Ideias com respostas rápidas
    - As selecionadas são desenvolvidas em desenvolvimento do produto, inovação ou inovação aberta
    - Quem dá a ideia acompanha o projeto e faz parte da equipe
- Projetos não podem ser cancelados após o ferramental ficar pronto
- O cancelamento de projetos se dá em decisões do colegiado mensais com a diretoria e alta direção

Avaliação

- Existem 10 competências essenciais (técnicas), uma pergunta para cada competência. Resulta em notas 3, 5, 7 ou 10.
- As metas das BUs dizem respeito ao faturamento (receita operacional, despesas...)
- Metas do departamento são relacionadas a metas financeiras (redução de custo, desempenho...)
- Metas individuais – nota de avaliação de desempenhos dentro das competências.
- Gestores são avaliados a cada 2 anos
    - Pelo superior direto, subordinados (itens referentes à gestão) e pares (relação com cliente/consumidor).
    - Nota final não influi na PLR
- Classificação forçada entre desempenho normal (20%), bom (70%) e superior (10%).
- Feedback formal na avaliação, mas é difundido que sejam dados feedbacks a qualquer momento.

Competências

- Indivíduos são organizados segundo suas competências técnicas e alocados nos projetos de acordo com elas

Incentivos

- Avaliação impacta na PLR proporcional ao salário
    - Todos recebem 1/3
    - 1/3 para as unidades que atingem todas as metas
    - 1/3 pela nota do departamento e avaliação individual
- Cerimônia de pessoas mais inovadoras que encaminharam pedidos de patentes. Ganham medalha de prata.
    - Patente concedida – medalha de ouro
    - Possibilidade de ganhar muitas medalhas e, nesse caso, uma espécie de estojo para guarda-las que se assemelha a um troféu

APPENDIX F – CODING EVOLUTION

Coding 1

- Lack of consistency of the rewards and evaluation system
- Strategic innovation managers dismissed or alienated careers
- Strategic innovation managers should have differentiated incentives and evaluation practices
- Rewards
    - Long-term success
    - Encourage experimentation
    - Group-based achievements
- Evaluation
    - Consider individual effort to enhance innovation
    - Provide rich feedback

Coding 2

- Lack of consistency of the rewards and evaluation system
- Strategic innovation managers dismissed or alienated careers
- Strategic innovation managers should have differentiated incentives and evaluation practices
- Career promotion within the strategic innovation function
- Rewards
    - Long-term success
    - Encourage experimentation
    - Group-based achievements
- Evaluation
    - Consider individual effort to enhance innovation
    - Focus on what is under the individual’s control
    - Provide rich feedback
- CEO
- Talent management

Coding 3

- Strategic innovation managers should have differentiated incentives and evaluation practices
- Career promotion within the strategic innovation function
- Rewards
    - Long-term success
    - Encourage experimentation
    - Group-based achievements
- Evaluation
    - Consider individual effort to enhance innovation
    - Focus on what is under the individual's control
    - Provide rich feedback
- CEO
- Talent management
- Strategic innovation roles and positions

Coding 4

- CEO and top management team
    - Should have innovation expertise and varied functional knowledge
    - Direct involvement of senior executives in strategic innovation projects
- Structured strategic innovation function
    - Develop a career within innovation
    - Career promotion within the strategic innovation function
- Strategic innovation managers should have differentiated incentives and evaluation practices
- Rewards
    - Long-term success
    - Encourage experimentation
    - Group-based achievements
- Evaluation
    - Consider individual effort to enhance innovation

    - Focus on what is under the individual's control
    - Provide rich feedback
- Talent management
- Strategic innovation roles and positions
    - Innovation managers interaction with senior managers
    - Build significant networks within the company
    - Having strategic innovation roles and positions through diverse hierarchal levels of the organization

Coding 5

Strategic innovation legitimation

Legitimation	Formalized procedures and structures
	Formalized roles and positions
	Senior executive's formal and direct involvement

Perceived career risk

Perceived career risk	May be led by	Projects' failure
		Lack of differentiated incentives for strategic innovation employees
		Rewards dependence of the project's success
		Cyclic and recent organization's restructures
	May be diminished by	Early failure tolerance
		Job security
		Reduction of the visibility of failed projects
		Raised recognition of employees experienced in strategic innovation
		Strategic innovation projects linked to the company's strategy

Strategic innovation roles and positions

Roles and positions	Should be positioned through diverse hierarchal levels of the organization
	Should include a chief innovation officer
	Strategic innovation team is usually formed by a small group of cross-functional individuals

Management positions	May be able to formally adapt and customize recognition and rewards to project leaders
	Should have good reputation and strong internal network within the company
CEO and top management team members	Should have innovation expertise
	Should have varied functional knowledge and competences

Talent management

Strategic innovation talents	Should be stimulated by specialized talent management and development
	Should be involved in the job design and decision-making
Talent retention	May be impacted by the lack of recognition of the employees' contribution, or the misalignment between the perceived contribution and the reward size
HRM's inclusive approach	Do not distinct a need of alignment between innovation strategy and HR systems, usually adopting the same approach throughout the company

HRM practices

HRM practices	Strategic innovation employees claim a HRM personalized support
	Should develop strategic innovation competences
	Should provide differentiated incentives and evaluation practices
	Should provide rich feedback
	Usually, strategic innovation area proactively defines their own metrics to be used on assessed process
Evaluation	Assessment results are used in decisions concerning salary, promotion decisions, and training
	Should have subjective criteria, based on their innovation competences
	Objective assessment should focus on what is under the individual's control, with adjustable metrics
	Metrics should be aligned between areas participating in the project
	Should shift to quantitative indicators as the projects moves into more advanced stages of development
	The use of evaluation practices on strategic innovation employees may be more effective on solving uncertainties than financial rewards
Rewards	Companies tend to use intrinsic rewards with strategic innovation employees and extrinsic rewards exclusively for executive positions

	May have a positive or negative impact on the development of strategic innovation
	Performance-based rewards can incentivize strategic innovation, if the objectives are developed considering its high uncertainty context
	Phantom stocks and spin-off offering rewards may hinder strategic innovation
	A poorly implemented reward system may discourage and resent strategic innovation employees
	The mutual use of rewards and evaluation practices, when assessment is emphasized, may inhibit strategic innovation
	Individual incentives should reward long-term success, and encourage intellectual experimentation
	Individual and group-based recognition and rewards should be balanced to incentivize collaboration
	Team-based evaluation and performance reward should be used together, especially in long-term achievements
Development	Career development can be promoted by the strategic innovation employees' visibility allowed by their frequent contact with executive management
	Career paths for innovation experts and innovation specialists
	The development of strategic innovation talent may be made by the use of talent pools
	The mutual use of intrinsic rewards and recognition practices may lead to developmental practices

Coding 6

	Theme	**Third order code**	**Impacts**
Strategic innovation management legitimation	**Strategy**	Clear communication of the innovation strategy	Lower career risk perception
		Projects are linked to the strategy	Lower career risk perception
	Structure	Formalized innovation unit structure	
		Strategic unit's position in the organizational chart	
	Leadership	CEO	Should have innovation expertise and varied knowledge
			Frequent changes - Higher career risk perception
			Internal or external selection - Possibility of innovation career

		Senior executives	Senior executives' direct and formal involvement with strategic innovation management
			Include a Chief Innovation Officer
			Existence of innovation committee
			Innovation representant on the board of directors
	Roles and positions	Strategic innovation team is usually formed by a small group of cross-functional individuals	
		Positions on diverse hierarchal levels of the organization	Possibility of innovation career
		Management positions should have good reputation and strong internal network within the company	
	Formalized procedures	The strategic innovation capability development involves formalized managing procedures	
	Project discontinuity	Determination of a culprit	Higher career risk perception
		Reduction of the visibility of failed projects	Lower career risk perception
		Early failure tolerance	Lower career risk perception
		Job security	Use of talent pools - Lower career risk perception
HRM practices	**Talent management**	Inclusive approach	Impact talent retention
		Exclusive approach	Claim for personalized support
			Differentiated assessment and incentives - Career risk perception

		Involvement in the job design and decision-making
	Raised recognition of innovation experience	Lower career risk perception
Evaluation	Evaluation process	Results are used in decisions concerning salary, promotion decisions, and training
		May be more effective on solving uncertainties than financial rewards
	Metrics	Should be subjective, based on innovation competences
		Objective goals should focus on what is under the individual's control
		Should shift to quantitative goals as the projects moves into more advanced stages of development
		Should be aligned between areas participating in the project
		Strategic innovation area proactively defines their own metrics to be used on assessed process
		Provide rich feedback and adjustable goals
Rewards	Dependance on project success	Higher career risk perception
	Managers may adapt and customize recognition and rewards	
	May have a positive or negative impact on the	

	development of strategic innovation	
	A poorly implemented reward system may discourage and resent strategic innovation employees	Lack of recognition or misalignment between reward size and contribution - Impacts talent retention
	Individual incentives should reward long-term success, and encourage intellectual experimentation	
	Individual and group-based recognition and rewards should be balanced to incentivize collaboration	
	Companies tend to use extrinsic rewards exclusively for executive positions	Companies tend to use intrinsic rewards with strategic innovation employees
	Performance-based rewards can incentivize strategic innovation, if the objectives are developed considering its high uncertainty context	
	Phantom stocks and spin-off offering rewards may hinder strategic innovation	
	The mutual use of rewards and evaluation practices, when assessment is emphasized, may inhibit strategic innovation	
	Team-based evaluation and performance reward should be used together, especially in long-term achievements	
Development	Career development	Visibility by the contact with executive management

		Creation of career paths for innovation experts and innovation specialists
	Develop strategic innovation competences	
	The mutual use of intrinsic rewards and recognition practices may lead to developmental practices	

Coding 7

Strategic innovation management legitimation

- Strategy
    - Clear communication of the innovation strategy
    - Projects are linked to the strategy
    - Project discontinuity
        - Determination of a culprit
        - Reduction of the visibility of failed projects
        - Early failure tolerance
        - Job security
- Structure
    - Formalized innovation unit structure
    - Strategic unit's position in the organizational chart
    - Strategic innovation team is usually formed by a small group of cross-functional individuals
    - Positions on diverse hierarchal levels of the organization

- Leadership
    - CEO
        - Should have innovation expertise and varied knowledge
        - Frequent changes - Higher career risk perception
        - Internal or external selection - Possibility of innovation career
    - Senior executives

        - Senior executives' direct and formal involvement with strategic innovation management
        - Include a Chief Innovation Officer
        - Existence of innovation committee
        - Innovation representant on the board of directors
    - Roles and positions
        - Management positions should have good reputation and strong internal network within the company

HRM practices

- Talent management
    - Inclusive x exclusive approach
        - Claim for personalized support
        - Differentiated assessment and incentives - Career risk perception
        - Involvement in the job design and decision-making
    - Raised recognition of innovation experience
- Development
    - Career development
        - Creation of career paths for innovation experts and innovation specialists
    - Develop strategic innovation competences
    - Visibility by the contact with executive management
    - The mutual use of intrinsic rewards and recognition practices may lead to developmental practices
- Evaluation
    - Evaluation process
        - Results are used in decisions concerning salary, promotion decisions, and training
        - May be more effective on solving uncertainties than financial rewards
    - Metrics
        - Should be subjective, based on innovation competences

        - Objective goals should focus on what is under the individual's control
        - Should shift to quantitative goals as the projects moves into more advanced stages of development
        - Should be aligned between areas participating in the project
        - Strategic innovation area proactively defines their own metrics to be used on assessed process
        - Provide rich feedback and adjustable goals

- Rewards
    - Dependance on project success
    - Managers may adapt and customize recognition and rewards
    - May have a positive or negative impact on the development of strategic innovation
    - A poorly implemented reward system may discourage and resent strategic innovation employees
        - Lack of recognition or misalignment between reward size and contribution - Impacts talent retention
    - Individual incentives should reward long-term success, and encourage intellectual experimentation
    - Individual and group-based recognition and rewards should be balanced to incentivize collaboration
    - Companies tend to use extrinsic rewards exclusively for executive positions
        - Companies tend to use intrinsic rewards with strategic innovation employees
    - Performance-based rewards can incentivize strategic innovation, if the objectives are developed considering its high uncertainty context
    - Phantom stocks and spin-off offering rewards may hinder strategic innovation
    - The mutual use of rewards and evaluation practices, when assessment is emphasized, may inhibit strategic innovation
        - Team-based evaluation and performance reward should be used together, especially in long-term achievement

Coding 8

Strategic innovation management legitimation

- Strategy
    - Clear communication of the innovation strategy – innovation culture
    - Projects are linked to the strategy
    - Project discontinuity
- Structure
    - Formalized innovation unit structure
    - Strategic unit's position in the organizational chart
    - Strategic innovation team, roles and positions
        - Management positions reputation and internal network
- Leadership
    - CEO
        - Strategic innovation expertise and varied knowledge
        - Frequent changes
        - Internal or external selection
    - Senior executives
        - Direct and formal involvement with strategic innovation projects
        - Include a Chief Innovation Officer
        - Existence of innovation committee

HRM practices

- Talent management
    - Inclusive x exclusive approach
        - Claim for personalized support (differentiated assessment and incentives)
        - Involvement in the job design and decision-making
    - Raised recognition of innovation experience
- Development
    - Career development
        - Career paths for innovation executives and innovation specialists
    - Develop strategic innovation competences

  - Visibility by the contact with executive management
  - The mutual use of intrinsic rewards and recognition practices leading to developmental practices
- Evaluation
  - Results are used in decisions concerning salary, promotion decisions, and training
  - May solve (project) uncertainties – feedback and goals adjustments
  - Metrics
    - Subjective: based on innovation competences
    - Objective: focus on what is under the individual's control
    - Shift to quantitative goals as the projects moves into more advanced stages of development
    - Aligned between areas participating in the project
    - Strategic innovation area proactively defines their own metrics to be used on assessed process
    - Provide rich feedback and adjustable goals
- Rewards
  - Extrinsic rewards
    - Used exclusively for executive positions
    - Dependance on project success
    - Performance-based: consider the high uncertainty context
    - Phantom stocks and spin-off offering rewards may hinder strategic innovation
    -
  - Strategic innovation employees usually receive only intrinsic rewards
    - Lack of recognition
    - Misalignment between reward size and contribution
    - Strategic innovation employees' discouragement and resentment
  - Managers may adapt and customize recognition and rewards
  - Individual incentives: reward long-term success, and encourage intellectual experimentation
  - Balanced individual and group-based recognition: collaboration incentive
  - Mutual use of rewards and evaluation practices
    - May hinder strategic innovation

        - Mutual use of team-based evaluation and performance rewards

Coding 9

Strategic innovation management legitimation

- Strategy
    - Projects are linked to the strategy
    - Project discontinuity
- Structure
    - Formalized innovation unit structure
    - Strategic unit's position in the organizational chart
    - Strategic innovation team, roles and positions
        - Management positions reputation and internal network
- Leadership
    - CEO
        - Strategic innovation expertise and varied knowledge
        - Frequent changes
        - Internal or external selection
    - Senior executives
        - Direct and formal involvement with strategic innovation projects
        - Include a Chief Innovation Officer
        - Existence of innovation committee

HRM practices

- Talent management
    - Inclusive x exclusive approach
        - Claim for personalized support (differentiated assessment and incentives)
        - Involvement in the job design and decision-making
    - Raised recognition of innovation experience
- Development
    - Career development

        - Career paths for innovation executives and innovation specialists
    - Develop strategic innovation competences
    - Visibility by the contact with executive management
    - The mutual use of intrinsic rewards and recognition practices leading to developmental practices
- Evaluation
    - Results are used in decisions concerning salary, promotion decisions, and training
    - May solve (project) uncertainties – feedback and goals adjustments
    - Metrics
        - Subjective: based on innovation competences
        - Objective: focus on what is under the individual's control
        - Shift to quantitative goals as the projects moves into more advanced stages of development
        - Aligned between areas participating in the project
        - Strategic innovation area proactively defines their own metrics to be used on assessed process
        - Provide rich feedback and adjustable goals
- Rewards
    - Extrinsic rewards
        - Used exclusively for executive positions
        - Dependance on project success
        - Performance-based: consider the high uncertainty context
        - Phantom stocks and spin-off offering rewards may hinder strategic innovation
        -
    - Strategic innovation employees usually receive only intrinsic rewards
        - Lack of recognition
        - Misalignment between reward size and contribution
        - Strategic innovation employees' discouragement and resentment
    - Managers may adapt and customize recognition and rewards
    - Individual incentives: reward long-term success, and encourage intellectual experimentation
    - Balanced individual and group-based recognition: collaboration incentive

- Mutual use of rewards and evaluation practices
  - May hinder strategic innovation
  - Mutual use of team-based evaluation and performance rewards

Coding 10

Strategic innovation management legitimation

- Strategy
  - Projects are linked to the strategy
  - Project discontinuity
- Structure
  - Formalized innovation unit structure
  - Strategic unit's position in the organizational chart
  - Strategic innovation team, roles and positions
- Leadership
  - CEO
    - Strategic innovation expertise and varied knowledge
  - TMT
    - Direct and formal involvement with strategic innovation projects
    - Include a Chief Innovation Officer
    - Existence of innovation committee

HRM practices

- Talent management
  - Inclusive x exclusive approach
    - Claim for personalized support (differentiated assessment and incentives)
    - Involvement in the job design and decision-making
  - Raised recognition of innovation experience
- Development
  - Career development
    - Career paths for innovation executives and innovation specialists
  - Develop strategic innovation competences
  - Visibility by the contact with executive management

    - The mutual use of intrinsic rewards and recognition practices leading to developmental practices
- Evaluation
    - Results are used in decisions concerning salary, promotion decisions, and training
    - May solve uncertainties – feedback and goals adjustments
    - Metrics
        - Subjective: based on innovation competences
        - Objective: focus on what is under the individual's control
        - Shift to quantitative goals as the projects moves into more advanced stages of development
        - Aligned between areas participating in the project
        - Strategic innovation area proactively defines their own metrics to be used on assessed process
        - Provide rich feedback and adjustable goals
- Rewards
    - Extrinsic rewards
        - Used exclusively for executive positions
        - Dependance on project success
        - Performance-based: consider the high uncertainty context
        - Phantom stocks and spin-off offering rewards may hinder strategic innovation
        -
    - Strategic innovation employees usually receive only intrinsic rewards
        - Lack of recognition
        - Misalignment between reward size and contribution
        - Strategic innovation employees' discouragement and resentment
    - Managers may adapt and customize recognition and rewards
    - Individual incentives: reward long-term success, and encourage intellectual experimentation
    - Balanced individual and group-based recognition: collaboration incentive
    - Mutual use of rewards and evaluation practices
        - May hinder strategic innovation
        - Mutual use of team-based evaluation and performance rewards