

Leadership in Innovation Management

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Final Project Report

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Abstract

Innovation is essential in today's corporate environment to maintain competitiveness, stimulate development, and satisfy changing consumer demands. To make the most of the possibilities of innovation, established systems must be managed effectively.

The standard ISO 56002 provides recommendations for Innovation Management Systems to assist companies in their innovation endeavors. It offers a structure for developing, putting into execution, and enhancing innovation management practices.

This standard looks at how leadership and innovation management interact. Leadership practices are brought into harmony with innovation by ISO 56002, which also empowers teams, encourages creativity, and offers guidance for creative development.

The interconnected trio of leadership, innovation, and innovation management forms the backbone of modern companies, propelling progress and product evolution. Recognizing this importance and prioritizing innovation management is crucial, with effective leadership fostering an innovative environment.

The purpose of this research is to investigate the relationship between innovation management and leadership.

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1 Introduction

In today's dynamic business environment, innovation is essential for businesses seeking to prosper and remain competitive. It acts as an incentive for development, allowing businesses to change, grow, and successfully meet the constantly changing needs of the market. To take full advantage of the prospect of innovation, it is necessary to have effective management, within established structures and rules.

The standard ISO 56002 appears as a strategic instrument created specifically to support businesses in their innovation efforts. This standard includes a collection of rules and concepts designed to support Innovation Management Systems. It offers a structure to help organizations create, execute, maintain, and improve their innovation management procedures over time.

This standard provides a perceptive look at how innovation management and leadership interact. The concepts and recommendations of ISO 56002 serve as a path, making it easier to incorporate successful leadership techniques into the innovation lifecycle. Aligned with ISO 56002, effective leadership not only creates plans but also empowers teams, fosters a creative culture, and promotes a sense of purpose and direction that drives inventive efforts into previously unknown areas of growth.

At the heart of this search is the interconnected trio of leadership, innovation and innovation management - indispensable, intrinsically linked pillars that sculpt the trajectory and strength of modern companies. Innovation is the engine of progress and serves as the catalyst that propels organizations to the vanguard, catalyzing the evolution of products, services and processes. Companies must recognize its fundamental importance and prioritize innovation management in order to harness its full potential. This is where the key role of effective leadership in innovation management lies, serving as the basis for developing an environment that fosters innovation.

This report's primary objective is to investigate how leadership and innovation management are interconnected.

2 Methodology

This section will outline the methodology behind the study and the steps that were taken.

2.1 Database selection and search strategy

The report began with a theoretical study in an effort to gain a deeper understanding of innovation management, leadership, and innovation. The literature search was executed through a multiple-stage process, using reputable databases including Scopus, Google Scholar and Google. Each phase of the search was structured to explore appropriate content relating to leadership, innovation and innovation management.

2.2 Initial research phase

The initial phase of the research consisted of a thorough examination that covered the topics of leadership, innovation and innovation management. Google and Google Scholar were the main search engines, using strategically chosen keywords such as "innovation", "innovation management" and "leadership". To ensure a comprehensive but targeted approach, no filters were applied at this stage, allowing the examination of a wide range of sources. The search results were screened meticulously, focusing on sources from respected platforms, including peer-reviewed journals, academic articles, academic books and other reliable online resources. To further investigate innovation and how it is measured, the Oslo Manual was comprehensively studied.

2.2.1 Source selection and screening process

To ensure the credibility and relevance of the selected sources, a careful selection process was implemented. The first filtering was based only on the title and platform. With this, 17 sources were considered. Abstracts, summaries and descriptions (depending on the source type) were analyzed to identify sources that provide relevant information to the scope of this report.

2.2.2 Inclusion criteria and source count

At this point, a total of eight sources were considered relevant and were used to find information for the report. These sources were carefully examined, ensuring that they contained relevant information to define the three concepts at hand. It was based on these documents that it was possible to craft the first part of the report.

2.2.3 Integration of the Oslo Manual

In addition to the research mentioned above, the Oslo Manual was also analyzed. The Oslo Manual's different guidelines have enriched the methodological basis, guiding the collection of relevant data and fostering a distinctive understanding of innovation measurement techniques. Its contributions have been fundamental in shaping the boundaries of the definition of innovation, outlining standardized approaches to classifying and measuring innovative activities within organizational structures.

2.2.4 Conclusion of the initial research phase

This initial phase, enriched by insights from the Oslo Manual, served as the basis for drafting the fundamental segment of this report. These meticulously selected sources, together with the guidance of the Oslo Manual, provided the necessary basis for articulating a comprehensive understanding of leadership, innovation and innovation management, essential for subsequent analytical efforts.

2.3 Connection between the concepts

Having delved into the essential concepts of leadership, innovation and innovation management, a solid foundation has been laid that promotes a comprehensive understanding of these fundamental areas. The knowledge gained from individual research now lays the groundwork for their interconnection and synergy within organizational structures.

2.3.1 Importance of interconnecting concepts

Recognizing the relationship between leadership and innovation management, it is now essential to link these critical concepts. This integration serves as a basis for leveraging the potential synergy between effective leadership strategies and the fostering of innovation processes in organizations. To verify this connection, the Innovation Management System Guidance also known as ISO 56002 standard was explored.

2.3.2 ISO 56002 analysis methodology

The analysis of ISO 56002 involves an extensive exploration of its main components, covering structures, processes and methodologies that aim to cultivate a culture of innovation in organizational environments. The ISO 56002 standard offers an insightful view of the interplay between leadership and innovation management. The standard's principles and guidelines act as a channel, facilitating the seamless integration of effective leadership strategies into the innovation lifecycle. Effective leadership, when aligned with ISO 56002, not only shapes strategies, but also empowers teams, promotes a culture of creativity and instills a sense of purpose and direction that propels innovative efforts into unfamiliar territories of progress.

2.3.3 Implications and perspectives

By clarifying the interaction between ISO 56002 and the knowledge gained about leadership and innovation management, this analysis seeks to reveal further usable insights. This knowledge not only emphasizes the importance of sticking to the established standards, but also sheds light on strategic paths to effectively draw on leadership practices to drive innovation initiatives following these standards.

2.3.4 Integration for a holistic understanding

The integration of ISO 56002 into the framework of leadership and innovation management further strengthens the scope of this study. It provides a connection between theoretical frameworks and practical applications, enriching the discussions

on the interplay between leadership, standardized innovation management systems and organizational innovation performance.

2.4 Leadership typologies and Innovation Management

Having established the fundamental connections between leadership and innovation management, the research now delves into the various typologies of leadership and their interaction with innovation management. This phase involved extensive exploration in Scopus to uncover the correlations between the various leadership approaches and their impact on promoting innovation within organizations.

2.4.1 Scopus search strategy

The research into leadership typologies and their association with innovation management began with the selection of the most relevant and applicable sources and for that, a series of refined filters were applied. Initially, the keywords "leadership", "innovation" and "innovation management" were incorporated, obtaining a range of 267 documents. Greater accuracy was achieved by restricting the search to the domains of "Business, Management and Accounting", "Engineering", "Economics, Econometrics and Finance" and "Social Sciences", which resulted in 143 documents considered relevant to the research objectives.

2.4.2 Analysis of search results

Of the 143 initial documents that originated on Scopus, a detailed analysis using the "Analyze Results" tool produced considerable results. In particular, the distribution of these documents by subject area showed that 38.5% belonged to "Business, Management and Accounting", while 16% were classified under "Social Sciences" and 11.5% were attributed to "Engineering". As it can be seen in the graph below in Figure 1.

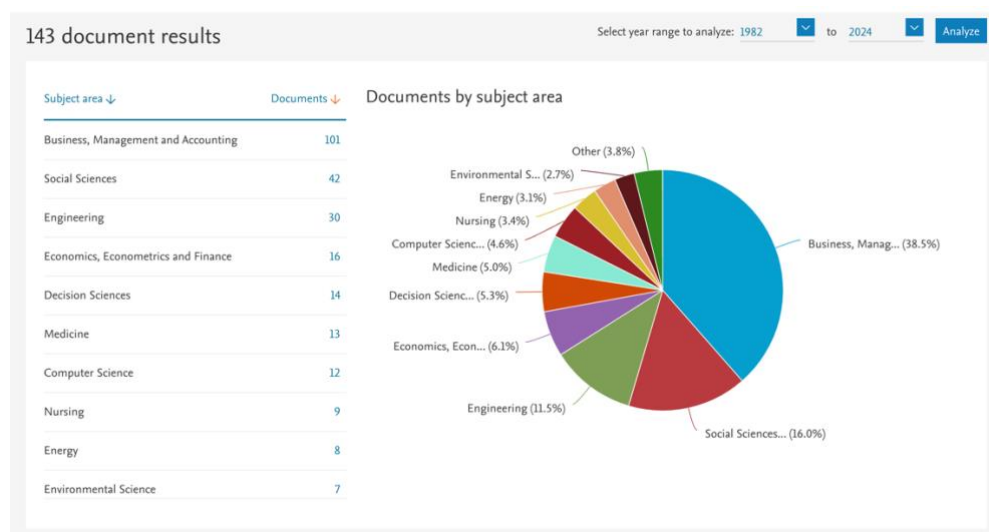


Figure 1 - Analysis of Results by Subject Area

Furthermore, in terms of geographical distribution, the majority of these documents originated in the United States, accounting for 26.6% of all publications. The United Kingdom then contributed 12.6% of the documents. The data can be seen in Figure 2.

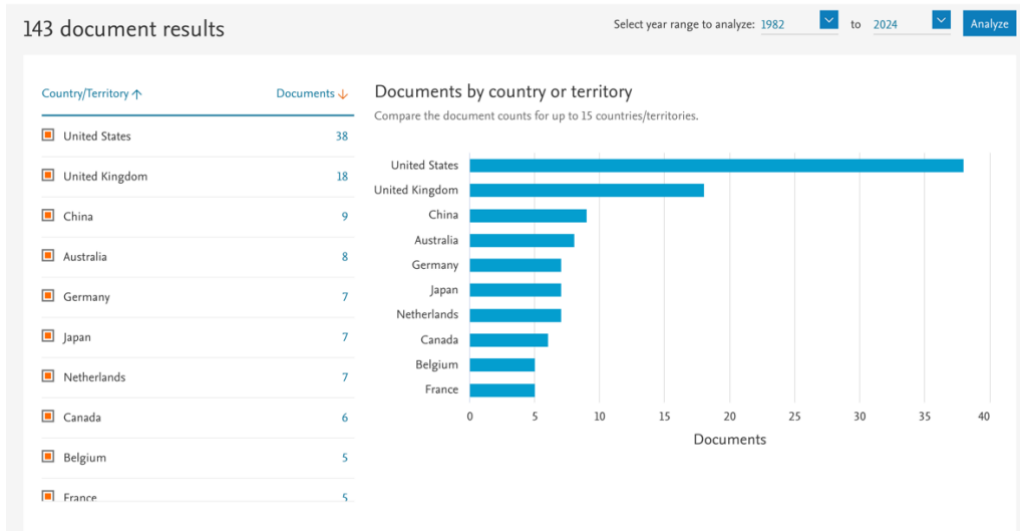


Figure 2 - Analysis of Results by Country or Territory

An insightful observation emerged when analyzing the publication trend over time. Since 1999, the number of documents published has been on an upward trend. However, this growth trajectory has not consistently followed a linear pattern, which suggests fluctuations or variations in publication rates in different periods. From 2000 to 2015, the number of annual publications fluctuated between one and eight, although the number varied from year to year. However, between 2015 and 2023, publications fluctuated between five and twelve documents per year, indicating a significant increase in interest in the topic over the years. Figure 3 illustrates this.

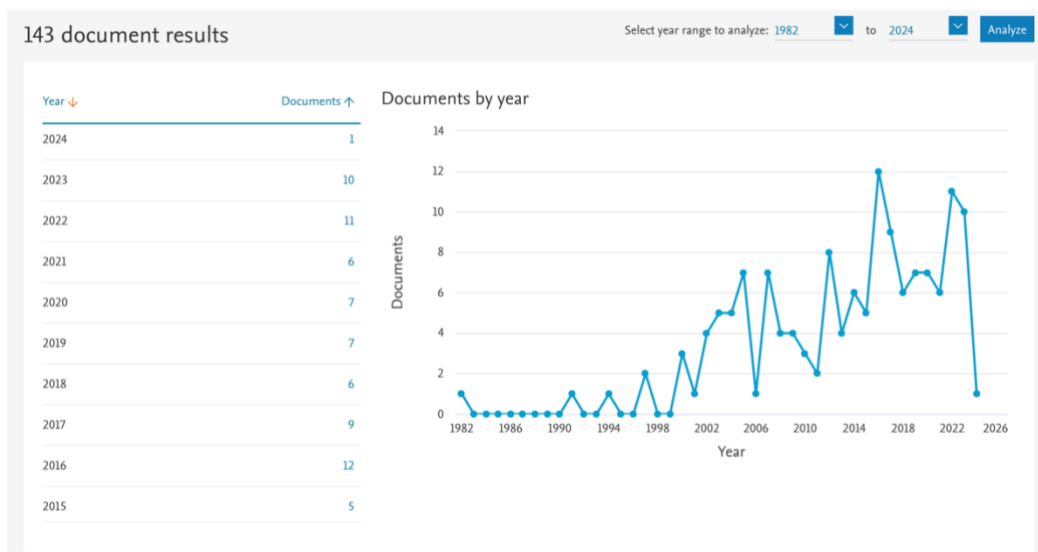


Figure 3 - Analysis of Results by Year

2.4.3 Inclusion and Exclusion Criteria

A thorough selection process followed, involving a meticulous review of titles which resulted in 33 documents being selected from the subset of 143. The abstracts of these 33 were read and following a careful evaluation, 25 documents emerged as key resources that justified a detailed examination and analysis.

2.4.4 Detailed analysis of the documents

The 25 selected documents were subjected to an analysis, which included an extensive reading of their content, methodologies and empirical results. These documents were examined to extract insights into the various types of leadership and their impacts on innovation management strategies in different organizational contexts.

This phase of bibliography analysis sought to uncover the links between transformational and transactional leadership styles, and their direct influences on the cultivation of innovative cultures, the promotion of creativity and the orientation of organizational strategies towards innovative goals.

3 Importance of Innovation

Innovation is fundamental to improving living standards and can affect individuals, institutions, entire economic sectors and countries in various ways (Oslo Manual 2018, 2018).

An innovation is a new or improved product, a process, or a combination of them, that differs significantly from the product or process previously used by the organization and that has been made available to potential users, in the case of a product, or put into use by the organization, in the case of a process. The concept of "innovation" can mean either an activity or the result of the activity (Oslo Manual 2018, 2018).

Innovation is the dynamic process that is the foundation of progress, transformation and continuous evolution. It is the engine that propels society forward, promotes economic growth and is a fundamental competitive edge for businesses. Organizational innovation can be achieved by introducing a new product, a new organizational structure, a new managerial practice or a change in organizational culture (Alblooshi et al., 2020). Innovations are considered to provide competitive advantages to firms and can enhance their business performance (Alblooshi et al., 2020).

Innovation extends beyond a novel concept or creation. An innovation must be implemented, which can include making it available for use by other parties, businesses, individuals, or organizations, or putting it into active usage (*Oslo Manual 2018, 2018*). Innovation is the process of conceiving, developing, and implementing new ideas, methods, products, or services that result in significant improvements, advancements, or enhancements compared to existing approaches. It represents the relentless pursuit of improvement, efficiency, and creativity. Innovation can take many forms. For instance, product innovation refers to the introduction of new or improved products. Process innovation, on the other hand, involves enhancing operational methods or procedures. Service innovation involves developing new services or improving existing ones. Business model innovation entails rethinking how a business creates, delivers, and captures value. There are many other types of innovation as well.

The essence of innovation lies in the generation and application of ideas that bring about significant changes, either through incremental improvements or disruptive transformations. It is driven by several individual factors like personality and motivation, as well as contextual factors related to the organizational climate and leadership style, which are its most determinant factors (Alblooshi et al., 2020).

This process involves the identification of a problem or opportunity, research and gathering of information, idea generation and screening, concept development and so on. This process is fueled by creativity, problem-solving, adaptation, risk-taking and value creation. Creativity is a crucial step because it involves thinking beyond what already exists and providing original solutions to existing problems. With this, it is worth mentioning that creativity and innovation are distinct but related constructs (Lee et al., 2020). Creativity is an intrapersonal activity concerned with the generation of truly innovative ideas. In contrast, innovation is a largely interpersonal activity concerned with introducing new ideas, which can come from anyone and anywhere, gathering support from others, and lastly, implementing the new ideas.

The Innovation process can take the form of a bottom-up approach, that is process-based and driven by organizational culture, which should allow creative thinking and tolerate risk, where creative ideas are generated by technical employees who seek to improve existing products and processes or to introduce new ones. It can also have a top-down approach that follows a vision-based managerial approach (Alblooshi et al., 2020).

Measuring innovation progress is crucial for effective innovation management. A measurement plan for innovation needs to take into account a number of factors, including selecting a subject or object approach, gathering both qualitative and quantitative data, identifying data sources, and assigning responsibility for data collecting. A measurement strategy's structure may change over time in reaction to new possibilities or difficulties, as well as changes in user needs and the kinds of data that may be gathered. Furthermore, disparate methods of measuring might be enhanced by one another (Oslo Manual 2018, 2018).

Innovation metrics can include indicators such as the number of new ideas generated, success rates of implemented innovations, time-to-market for new products, return on innovation investment, and the impact of innovations on market share or customer satisfaction. These metrics help evaluate the effectiveness of innovation efforts and guide decision-making, enabling companies to manage innovation effectively.

Effective innovation management aligns innovation initiatives with the organization's overall strategy. This ensures that innovation efforts are directed towards achieving the company's long-term goals and vision. When innovation is integrated into the strategic planning process, it becomes a core driver of growth and competitiveness.

The conclusion drawn is that innovation contributes positively to numerous dimensions of human life.

4 Innovation Management

A novel concept, model, procedure, or prototype must be put into practice in order to qualify as an invention. Organizations that want to implement innovation must work methodically to make sure that potential users may access it for their own internal processes and procedures or for external users of their products (Oslo Manual 2018, 2018). This is why innovation management is important.

Innovation management is a crucial field of study as the ability of organizations to reap the benefits of innovation depends on how effectively it is managed. Innovation plays a significant role in economic performance, competitiveness of corporations, environmental sustainability, employment levels and nature, and ultimately the overall quality of life (Mark Dodgson et al., 2013).

Innovation management is a strategic and systematic approach used by organizations to promote and guide the processes of conceiving, developing, implementing and optimizing innovative ideas and practices. It affects how the organization responds to new opportunities. Innovation management refers to a set of tools that enable managers and engineers to work together with a shared understanding of objectives and processes. The primary aim of innovation management is to help the organization capitalize on external opportunities (from customers, suppliers, competitors, consultants, media, globalization, etc.) or internal opportunities (from technical divisions, marketing and sales, logistics, production, etc.) by using creative efforts to introduce new ideas, processes or products (Şimşit et al., 2014).

The study of innovation management involves understanding the sources, nature, and outcomes of innovation within the economic, technological, and social contexts (Mark Dodgson et al., 2013). This approach includes a collection of structures, methodologies, and guiding principles intended to foster an atmosphere in which original ideas are effectively realized. This process can be divided into six steps. These steps include identifying innovation projects, scoping and focusing them, utilizing creativity, selecting the best ideas for further development, evaluating the performance of new products or services prior to their release, and diagnosing problems and improvements for better commercialization. Each step involves various tools and techniques that are selected based on the structure of the company, target market, or type of product or service (Şimşit et al., 2014). Management innovation, then, relates to changes in how managers set directions, make decisions, coordinate activities, and motivate people (Vaccaro et al., 2012).

Introducing innovative ideas into an organization can be a challenging process that involves navigating through complex changes in processes, structures, and mindsets. To successfully implement innovation initiatives and drive organizational growth, it is crucial to have an effective change management strategy in place. Innovation implementation involves translating innovative ideas into tangible actions and outcomes, which requires orchestrating changes in workflows, organizational structures, resource allocation, and cultural norms to integrate and sustain innovative practices within the organization. However, resistance to change is a common challenge in innovation implementation: employees may resist new ideas due to fear of the unknown, perceived threats to job security, or reluctance to alter established routines. Management must prioritize transparency, training, and support to address concerns and promote innovation benefits.

Creating a culture that promotes innovation is vital for effective innovation management, it is a catalyst for fostering creativity, driving progress, and sustaining long-term success. Companies that encourage taking risks, reward experimentation,

value diversity of thought, and create a secure environment for sharing ideas are more likely to be innovative. Leaders play a crucial role in nurturing such cultures by setting the tone, providing support, and promoting a mindset of continual improvement.

The innovation climate of an organization refers to how its members perceive and experience the shared goals of innovation vision, the effectiveness and sustainability of creative practices, and the level of support provided for innovation-related efforts (Xie et al., 2018). It is the outcome of people's opinions and experiences working together within the organization's structure, and it represents the vitality and endurance of innovation-based projects.

On the other hand, the organizational climate refers to the overall perception of staff members toward the company's policies, procedures, and other general aspects. It encompasses the emotions, behaviors, attitudes, and work practices that employees demonstrate. This psychological environment reflects the extent to which each individual values and understands the attributes of the workplace that embody organizational innovation. Essentially, it portrays the impact of the organizational culture on the employees' work habits, mindset, and attitude.

Innovation is inherently fraught with uncertainty and risk, which makes effective risk management a crucial component for organizations that seek to innovate successfully while minimizing negative impacts. The risks involved can manifest in various forms, including financial risks, technological uncertainties, market acceptance, regulatory challenges, and potential disruptions to existing operations. These risks can often serve as a discouragement for organizations to embrace innovation. If not managed properly, they can lead to failed initiatives. In order to manage risks in innovation effectively, organizations need to take a proactive approach and implement strategies that help to identify, assess, mitigate, and monitor risks throughout the entire innovation process. This requires conducting thorough risk assessments, scenario planning, and establishing risk mitigation strategies that are tailored to each specific innovation project.

Successful innovation requires a delicate balance between taking calculated risks and implementing risk mitigation measures. Encouraging a culture that allows for experimentation and tolerates failure as a necessary part of the learning process is fundamental. However, organizations must also implement controls and fallback plans to manage potential negative outcomes. Innovation risk management is an iterative process that requires continuous learning and adaptation. Besides that, organizations should regularly review and refine their risk management strategies based on feedback, lessons learned from both successes and failures, and evolving market dynamics. This adaptive approach allows for agile responses to changing circumstances. As innovation landscapes evolve, emerging trends in risk management may include the integration of predictive analytics and AI for risk assessment, greater emphasis on cybersecurity risks in innovation projects, and the development of frameworks specifically designed to address risks associated with disruptive technologies.

Setting innovation objectives in an organization is crucial and must be aligned with several key principles. These objectives must be in harmony with the organization's innovation policy and aligned with the overall innovation vision. Consistency between the various functions and levels is vital, ensuring measurability or verifiability wherever possible. In addition, these objectives must take into account the relevant requirements, be monitored and be effectively communicated and understood throughout the organization. Regular updating and documentation of these

objectives are essential components for their preservation and subsequent reference in the organization's records (UNE, 2021).

Managing each innovation initiative in an organization involves several critical considerations. Firstly, it is necessary to establish and continually review the scope of the initiative, defining the objectives, limitations, expected results and outcomes. Secondly, it involves identifying and applying indicators to assess and improve the initiative's progress. Thirdly, it requires the creation of management and decision-making structures, such as steering or reference groups. In addition, adequate leadership, support structures and resources must be ensured. Acquiring and retaining individuals with the necessary skills, forming cohesive teams, defining roles and responsibilities and promoting internal and external collaboration are also essential. Establishing and implementing appropriate innovation processes, safeguarding intellectual property and critical assets and complying with legal and regulatory requirements are integral aspects. In addition, the continuous collection of lessons learned, including using failures as learning opportunities, is crucial for gaining new perspectives and advancing organizational knowledge and perspectives (UNE, 2021).

As part of the pursuit of establishing solid innovation management systems, the study of ISO 56002 has arisen as a central focus in the literature. ISO 56002 is an innovation management guide, offering comprehensive guidelines and principles designed to standardize and optimize innovation management processes in organizations. Therefore, in the landscape of innovation management literature, the exploration and analysis of ISO 56002 is crucial, highlighting the path towards effective and structured innovation management practices.

4.1 Analysis of the ISO 56002 standard

One of the most influential factors that deeply shapes the innovation management landscape in any organization is undoubtedly leadership. It is not just a small part of the organization's structure, it plays a crucial role in creating an environment where innovation can thrive, enabling continuous progress and long-term sustainable growth for the organization. The relationship between leadership and innovation management is the foundation of success in today's dynamic business environment. In this complex interaction, the integration of ISO 56002 emerges as a guiding light, harmonizing leadership strategies with the principles of innovation management, thus announcing an era of transformative potential and continuous adaptation.

Leadership, in its essence, represents the guiding force that leads teams through unknown territories of invention and transformation. It encapsulates vision, direction and a determined commitment essential to cultivating an atmosphere in which innovation not only flourishes but becomes an inherent part of the organization. ISO 56002, serving as a comprehensive framework guiding innovation management, goes beyond recognizing this fundamental role of leadership, it elucidates and integrates the fundamental elements of leadership into the fabric of innovation strategies.

The role of top management in promoting an effective innovation management system is complex and requires strong leadership and commitment demonstrated through a wide range of activities. Firstly, they are responsible for the efficiency and effectiveness of the system. This involves establishing and securing the alignment of the innovation vision, strategy and objectives with the strategic direction and context of the organization. In addition, they have the responsibility of cultivating a culture that supports innovation, integrating innovation requirements into existing

structures and providing the necessary resources and support. Their responsibilities extend to empowering leaders at all levels to develop innovative leadership skills and ensure structures for the success of the system. The role of senior management also encompasses communicating, engaging and encouraging contributors to innovation, while promoting continuous improvement and performance evaluation. In addition, they are tasked with establishing an ambitious but achievable vision for innovation, guiding strategic decisions, inspiring commitment internally and communicating externally for the organization's reputation and attracting stakeholders (UNE, 2021).

Top management has a responsibility to consider the creation of specialized organizational structures, adapted to the size and needs of the organization. This consideration emerges in various situations, such as when disruptive or radical innovations are expected to challenge existing offerings. Another situation is when different leadership styles, incentives, indicators or cultures become essential and when exclusive resources are needed for innovation activities and, finally, when certain operations require adaptation to a greater degree of uncertainty and variability compared to established processes. The decision to create specific structures is motivated by the need to effectively accommodate and support innovative efforts within the organization (UNE, 2021).

Given this context, it is important to deepen a better understanding of leadership and its implications.

5 Leadership

Leadership plays a pivotal role in many fields, shaping the direction and success of organizations, teams and communities. It has a wide range of definitions since it is used in various subjects, has many variables and has a complex nature. The simplest definition is the capacity to influence others to achieve goals (Hughes R., 2009).

It can also be described as “a process whereby an individual influences a group of individuals to achieve a common goal”, where it is possible to identify four themes when defining leadership: “leadership is a process”, “leadership involves influence”, “leadership occurs in a group context” and “leadership involves goal attainment”(South West & Bolden, 2004).

It is important to mention that leadership is a process and not just a personal quality (Silva, 2016). This process is characterized as the interactive influence between the leaders and the followers. Understanding this process and the attributes required to effectively influence others are the main steps in studying leadership.

In an organization, leaders inspire followers and make them more aware of the importance of the organizational mission and goals so they can think creatively and have a good performance, then they recognize their followers' contributions and continue to encourage them. Leadership is not simply a matter of implementing changes in other people's behavior, but more to do with enhancing their voluntary compliance. This notion relates to the leader's ability to motivate, an indispensable part of the subject under study. The essence of leadership is how leaders influence their followers' judgment so that collective aims can be achieved through unified thoughts and actions. Therefore, the effect of leadership relies on trust.

However, the definition does not distinguish good and bad leadership nor effective and ineffective leadership. Good and bad leadership depend on the consequences of the process, which can be subjective by themselves. Leadership effectiveness can be obtained if the desired results have been obtained, which is much more objective to analyze (Silva, 2016).

Leaders are committed to capacity building and empowering others, inspiring and encouraging creative thinking. This concept is defined either based on personal traits and behaviors, and has many aspects like intellectual stimulation, role modeling and coaching.

There are some characteristics that are established to describe successful leaders like having a big-picture vision, integrity, empathy, good communication skills, clear decision-making, problem-solving, and so on.

Despite being two different concepts, leadership and management can be integral parts of the same job and are often studied together as it is possible to describe leadership as just one dimension of a multifaced management job (South West & Bolden, 2004). It is still important to make a distinction between someone in a leadership role and someone who has power and authority.

In a corporate context, leadership is the process of guiding an organization, its employees and its resources towards achieving corporate goals and objectives. In this scenario, a successful leader sets a direction, shapes the corporate culture by modeling desired behaviors and values and motivates and inspires employees. A successful company leader also makes critical decisions and promotes teamwork to achieve common goals.

It is possible to identify various leadership theories and typologies, although in this report only two of them will be studied.

5.1 Effects of leadership on innovation

As previously stated, innovation is a crucial aspect for any organization as it enables them to remain competitive, adaptive, and relevant in a constantly evolving market. By fostering innovation, organizations can distinguish themselves from their competitors and thrive in the market. With this, it is possible to say that creating an environment that supports and sustains innovation is crucial for any organization, and leadership plays a central role in this process.

The impact of leadership on innovation within an organization is a multifaceted and critical aspect that affects every stage of the innovation process. To understand how leadership impacts innovation, it is necessary to explore the different dimensions and mechanisms through which it shapes, influences, and drives the innovation agenda within an organization.

Leaders who are considered innovation leaders possess certain qualities that set them apart from other types of leaders. They have a unique ability to evaluate organizational processes from a creative standpoint, which allows them to develop various types of innovations. They are adaptable and open to change and are willing to take risks associated with it. These leaders are driven by their passion and possess a strong belief in their mission, which helps them to attract talented individuals and create highly motivated teams. Innovation leaders may approach innovation from a front-end perspective, focusing on ideation and exploring new concepts, which requires organizational creativity. Alternatively, they may approach innovation from a back-end perspective, transforming ideas into tangible and valuable outputs that meet market demands and cost-efficiency targets (Alblooshi et al., 2020).

Effective leadership is essential in fostering an environment that promotes creativity, risk-taking, and transformative thinking. It is the responsibility of an enterprise's leadership to motivate its members to take proactive steps toward achieving their goals. Innovation is greatly influenced by leadership as it encourages the implementation of imaginative ideas within an organization. When team members are driven by their leaders, they are more likely to take the initiative in recognizing and appreciating their team, which leads to a stronger sense of belonging. Collaboration, teamwork, a sense of collective pride, and trust are all conducive to fostering innovation and creative activities. Enterprises with strong leadership and innovation capabilities generally perform better as they are able to quickly respond to a competitive environment and seize opportunities (Xie et al., 2018).

Encouraging and supporting innovation teams is a crucial aspect of effective leadership in organizations that aim to create a culture of creativity and drive meaningful change. It involves providing teams with the necessary resources, autonomy, and motivation to explore new ideas, take calculated risks, and transform innovative concepts into reality. Leaders can support subordinates in making sense of changes, providing guidance and help when changes may seem ambiguous (Vaccaro et al., 2012).

Leaders play an active role in promoting opportunities for learning and development, from both successes and failures. They encourage their team to reflect on past experiences and use them as a foundation for growth and improvement. Additionally,

they provide resources and support to ensure that their team is equipped with the necessary skills and knowledge to succeed in their roles.

Effective leaders delegate authority and provide autonomy to their teams, allowing them to take ownership of innovative projects. By decentralizing decision-making processes and giving teams the freedom to explore ideas, leaders encourage a sense of responsibility and accountability, fostering a culture of empowerment. This autonomy instills trust and confidence within teams, enabling them to take risks and experiment without the fear of micromanagement or unnecessary constraints.

Leaders are of considerable importance in creating and nurturing a culture that fosters innovation. They do this by actively shaping the norms, values, and attitudes that prioritize and embrace innovation. By advocating a mindset that values experimentation and embraces failure as an inherent aspect of the learning journey, leadership performs a crucial role in cultivating an environment that inspires creativity and promotes continuous improvement. Good leaders create such an environment where calculated risks are encouraged, giving their team the freedom to explore new ideas and techniques. They foster a culture that sees failures and setbacks as opportunities to learn and grow, thereby promoting resilience and a growth mindset. It is all about how leaders' behavior, actions, and vision contribute to building a culture that fosters innovative thinking within the organization. By promoting a culture of resilience and persistence, these leaders reinforce the idea that setbacks are a natural part of the innovation process and encourage teams to learn, adapt, and iterate on their ideas. In order to foster innovation, ample resources are necessary, both financial and technological. Teams need access to sufficient funding, cutting-edge tools, and dedicated spaces for brainstorming sessions to turn their ideas into actionable innovations. Leaders can further support their teams by investing in tailored training and development programs that enhance creativity and critical thinking skills. By doing so, teams are better equipped to tackle challenges and come up with innovative solutions.

One of the duties of a leader is to set the tone through their behavior. Leaders who are open to new ideas, actively listen to diverse perspectives, and encourage collaboration across teams create an environment where creativity thrives. Such behavior communicates trust and psychological safety, empowering employees to contribute innovative solutions without fear of ridicule or rejection. The absence of trust between leaders and team members can weaken the morale of the team, which in turn can have a negative impact on their attitudes toward innovation. Additionally, the lack of trust can lead to the misallocation of resources, influence the team's perception of the importance of creativity and innovation, and hinder the persistent development of innovative solutions (Xie et al., 2018).

Leaders play a crucial role in shaping the organizational narrative. They highlight the significance of innovation in achieving strategic goals and communicate a compelling vision that aligns innovation efforts with the organization's mission. This creates a sense of purpose and direction for employees, allowing them to proactively seek opportunities for creative problem-solving and breakthrough ideas. By conveying a clear and inspiring message about the value of innovation, leaders motivate individuals to contribute to the organization's growth and success.

Exemplary leaders foster innovation by publicly acknowledging and rewarding contributions, thus motivating employees.

Furthermore, leaders facilitate communication between teams and management, ensuring innovative ideas receive support. They remove roadblocks and provide guidance and mentorship.

Strategic decision-making and innovation are two interdependent elements that play a vital role in defining an organization's ability to adapt, evolve, and maintain a competitive edge in the constantly changing business landscape. Effective leadership in strategic decision-making is crucial in aligning innovation efforts with the organization's overarching goals and ensuring that innovative initiatives drive sustainable growth and success.

The integration of innovative thinking into the organization's strategic planning process lies at the core of strategic decision-making for innovation. Leaders who champion innovation strategically align the organization's vision, mission, and long-term goals with innovation strategies. They articulate a clear vision that emphasizes innovation as a core element in achieving competitive advantage and meeting evolving market demands. This enables the organization to stay ahead of the curve and achieve long-term success.

Additionally, successful leaders use a strategy of managing an innovation portfolio, which involves balancing immediate gains with long-term goals. This balanced approach entails a combination of small-scale innovations that improve existing products/services and significant innovations that can redefine markets or even create new ones. By striking the right balance, the organization can ensure a continuous innovation process while still holding onto its current market position.

This process presents challenges that must be strategically addressed. Understanding and tackling these challenges is crucial for driving innovation within organizations. One of the biggest obstacles to innovation is the natural resistance to change that exists among individuals and within organizations. Employees may be hesitant to embrace new ideas or practices due to the fear of the unknown, the potential disruption of established routines, or the perceived risks associated with change. Organizations, particularly those with rigid hierarchies and strict protocols, often cultivate risk-averse cultures. This fear of failure and its potential consequences may discourage individuals and teams from exploring new ground, thus impeding innovation. Innovation efforts can also be hampered by constraints such as limited financial resources, time, or skilled manpower. Tight budgets, conservative investment strategies, and a shortage of talent with specialized skills can all hinder the implementation of innovative ideas. Cumbersome bureaucratic processes and hierarchical structures can also stifle innovation. The need to navigate through multiple layers of approval, complex decision-making channels, and rigid organizational structures can significantly slow down innovation processes.

However, effective leadership and a leader's appropriate actions can help mitigate those challenges.

For an innovative leader to be successful, they must possess several qualities either innately or acquired. Firstly, an innovative leader must be socially knowledgeable to be able to understand the problems people face and find relevant solutions. An innovative leader should also possess both tacit and explicit technical knowledge to properly utilize relevant technologies to solve problems and improve the quality of life. Additionally, an innovative leader is expected to be talented, intelligent, and able to analyze the surrounding environment to compete effectively. They should be driven by values such as equality, honesty, and integrity, and have a strong belief in their actions to influence followers and maintain open communication with them.

Above all, innovative leaders should have the willpower to make changes and deliver what they believe in (Alblooshi et al., 2020).

6 Leadership typologies

Leadership styles are dynamic and adaptable approaches that leaders use to guide and influence their teams. They are the characteristic behaviors, approaches, and methods that leaders use to manage, guide, and influence their teams or organizations. There are different leadership styles, each with its own unique philosophy, approach to decision-making, communication methods, and ways of interacting with team members.

A leader can have multiple leadership styles simultaneously and this ability to adapt and blend various styles is commonly considered a strength of effective leadership. These adaptations can result from specific circumstances a leader encounters, the type of tasks and decisions at hand, organizational culture, or they may adapt their leadership depending on what works with different teams, for example.

Leadership styles can be developed and refined through self-awareness, feedback, training, and experience. Leaders can consciously work on improving their communication skills, emotional intelligence, decision-making abilities, and adaptability to enhance their leadership effectiveness.

Although there is a wide variety of leadership styles, this report will only focus on Transformational and Transactional, which will be introduced and explained in the subsequent section. The study of transformational and transactional leadership styles in the context of innovation management allows for a comparative analysis of contrasting leadership approaches. Transformational leadership, known for inspiring innovation and empowering followers, opposes transactional leadership, which emphasizes rewards and adherence to established procedures. Exploring these styles will provide an opportunity to examine their impact on fostering creativity, managing change and promoting innovation in organizations, providing insights into effective leadership strategies for managing innovation.

6.1 Transformational

The first leadership typology that was analyzed was Transformational. When it comes to innovation, this typology is the most studied (Łukowski 2017). Beyond just managing projects or operations, transformational leadership is a potent and persuasive approach. This leadership style places a strong emphasis on encouraging and inspiring followers to do remarkable achievements, frequently putting the success of the group ahead of their own self-interests.

Transformational leaders are named this way because of their ability to transform their followers from a self-oriented attitude to higher levels of enthusiasm. Transformational leadership emphasizes collective interest and achieving a collective goal, stimulating self-confidence, morale and motivation (Liao et al., 2017).

This style can be analyzed by taking into account four concepts such as idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. These explain how transformational leaders affect innovation (Ryu and Shim 2020).

By setting a positive example, transformational leaders gain the respect, trust, and admiration of those who follow them. Their staff is inspired by their strong morals, beliefs, and forward-thinking vision. They serve as role models and encourage others to imitate their habits and work toward common goals because of their captivating

personalities and strong moral convictions. This is what is called idealized influence. The level of admiration, respect, and trust that people have for leaders is reflected in their idealized influence. This dimension encompasses charismatic leadership behavior that builds followers' sense of internal motivation to accomplish objectives (Vaccaro et al., 2012).

The element that requires leaders to be able to express a captivating vision that captivates and energizes their followers is known as Inspirational Motivation. They convey this vision in a way that inspires passion and gives the organization a feeling of direction and purpose. They inspire passion and dedication from their team members by fostering optimism and a common idea that teamwork will lead to success. Intrinsic motivation, which is an intense drive to find novel solutions to changes in management procedures, practices, or structures, is influenced by inspirational motivation (Amabile, 1996, 1998).

Within their teams, transformational leaders foster innovation, creativity, and critical thinking. This is known as Intellectual Stimulation. They challenge the current situation by fostering an atmosphere that values new perspectives and encourages followers to exercise independent thought. They inspire curiosity, raise insightful questions, and give their group the freedom to consider different perspectives and approaches to problems. Followers of transformative leaders are encouraged to challenge the efficacy of the company's current management procedures (Sosik, 1997).

These leaders express sincere concern and care for the needs and personal growth of every member of their group. They acknowledge the individual qualities and weaknesses of their followers while offering guidance, encouragement, and individualized attention. Actively listening to their team members, transformational leaders provide direction and specialized support to enable them to reach their greatest potential. This is the idea behind Individualized Consideration. By demonstrating to followers that their work matters and is valued by organizational leaders, individual consideration also encourages attention and distributed engagement in improving management methods and processes (Vaccaro et al., 2012).

Building strong, engaged teams, encouraging innovation, and accelerating organizational change benefit from transformational leadership. It promotes great performance, strengthens employee dedication and engagement, and fosters a good work environment. This kind of leadership may result in significant organizational growth, allowing for flexibility in changing circumstances and fostering long-term success. These leaders foster teamwork by concentrating on shared interests and objectives, and they are prevalent in organizations with innovative and adaptable work environments (Alblooshi et al. 2020). A primary focus of transformational leaders is the sense of ownership they foster in their followers by investigating multiple approaches to problem-solving from many perspectives. Their ability to communicate effectively and their willingness to take risks have an impact on the team's ability to come up with new ideas, products, services, and even technologies (Costa et al., 2023).

There are several behavioral ways in which transformational leaders differ from other types of leaders. To begin with, transformational leaders inspire, develop, and disseminate a shared vision. Secondly, they offer chances for workers to enhance their abilities and push them to achieve peak performance, necessitating that these leaders furnish their staff with all the necessary tools, training, and authority to make choices and create (Alblooshi et al., 2020).

This leadership style is crucial for innovation, as it focuses on guidance and training that generate intellectual stimulation and charismatic influence to help followers become more efficient without judging them (Costa et al., 2023). Transformational leaders set an example, articulate a vision, push employees to think creatively while offering the necessary resources, foster teamwork, and hold them to a high standard of performance (Alblooshi et al., 2020).

6.2 Transactional

Transactional leadership is a style centered on the exchange between leaders and followers, with an emphasis on clarifying roles, tasks and expectations. It is focused on everyday operations, efficiency and maintaining stability within an organization. It is based on a structured approach that prioritizes clear guidelines, performance standards and specific rewards and penalties for meeting or failing to meet these standards. These extrinsic motivators are based on the needs of the employees and are associated with their professional performance (Costa et al., 2023). Therefore, the transactional leader concentrates on exchanges between the leader and the follower in terms of benefits, rewards, incentives and self-interest, and if the subordinate doesn't achieve the goal, this results in punishment (Costa et al., 2023). This leadership approach is often contrasted with transformational leadership and is based on three fundamental elements, which are Contingent Rewards, Management by Exception and Laissez-Faire (Fakhri et al. 2020).

Contingent rewards depend on the way that leaders reward followers based on gathering laid-out goals and expectations. This exchange is the foundation of motivation and performance in this leadership style. These rewards are a motivational tool transactional leaders use to provide incentives or prizes for achieving predefined goals or milestones. Employees who complete predetermined tasks or meet predetermined goals are rewarded with incentives like bonuses, promotions, or recognition under this transactional system. Contingent reward involves clarifying and specifying what is expected of the members of the organization and evaluating the goals and subsequently rewarding their achievement (Vaccaro et al., 2012).

Transactional leaders intervene only when deviations from established standards occur. They usually monitor performance closely and address issues or problems as they arise. This is management by exception. This approach consists of keeping an eye out for deviations from the norm and taking appropriate action. Transactional leaders use both active and passive management styles, by exception. In contrast to passive management, which only steps in when issues get out of hand or standards are noticeably missed, active management entails proactive intervention when deviations are noticed. Thus, the difference between them lies in the timing of the leader's intervention (Tavanti, 2008).

Finally, Laissez-Faire, which happens in certain situations, is where leaders give followers autonomy and freedom to work without direct interference, especially when followers are competent and self-motivated.

Within an organization, transactional leaders set up distinct positions, duties, and expectations. They continue to operate hierarchically, with top management issuing directives and staff being expected to follow set rules and guidelines.

Task-oriented activities and making sure predetermined objectives are fulfilled effectively and within certain parameters are highly valued aspects of transactional

leadership. Reaching short-term objectives and preserving stability are supported by this job completion emphasis.

Transactional leadership is useful for keeping things organized and under check, but it can unintentionally stifle originality and creativity. It's possible that the strict framework and emphasis on following rules will deter people from taking chances and prevent them from exploring new concepts or unusual methods. Transactional leadership can be a barrier to innovation and does not contribute to organizational learning, given that this style of leadership is context-focused and based on micro-management or classical management, as they are afraid to experiment with new methods (Costa et al., 2023). With this leadership typology, it is expected for innovative performance to be lower when creativity is limited, since the objectives are already defined (Alblooshi et al., 2020). As a consequence, employees are not sufficiently motivated to contribute beyond what is specified (Bryant, 2003). Nonetheless, this approach is relevant for businesses to rapidly accomplish short-term objectives and functions well in big enterprises (Brillo and Boonstra 2018).

6.3 Leadership typologies and innovation management

Even though they are very different, transactional leadership and transformational leadership are not two opposite ends of the spectrum, but two different concepts (Bass 1985).

A common vision, risk-taking, and innovation are all encouraged in an atmosphere that is nurtured by transformational leaders. By encouraging and motivating staff members, they foster a culture in which people feel comfortable sharing their thoughts. This strategy fosters a creative culture where new ideas and methods are embraced by giving team members a feeling of purpose and ownership.

Beyond conventional compliance, transformational leaders are adept at inspiring and energizing their workforce. Their intriguing projected future and captivating vision excite teams to go above and beyond, creating intrinsic drive. Innovation is sparked by this high degree of involvement because people are motivated to try new things, take risks, and rise to difficulties. Long-term innovation is frequently a result of transformational leadership's visionary quality. These executives push organizations toward radical innovations that reshape sectors by emphasizing disruptive developments and supporting ground-breaking concepts. This approach works especially well in sectors where market dynamics are changing quickly or where constant innovation is necessary.

Organizational efficiency and stability are fostered by transactional leadership.

Task completion and conformity to specified standards are ensured by this strategy, which offers rewards for reaching targets and sets defined goals.

Consistency and operational efficiency are supported by this stability.

Transactional leaders are good at accomplishing little, gradual improvements and short-term objectives. They place a strong emphasis on achieving set goals, increasing output, and following protocols. Although this method guarantees consistent advancement, it could prevent individuals from taking chances and limit bold ideas. Transactional leaders place a strong emphasis on maintaining control and adhering to set procedures. This methodical approach offers a structure that guarantees responsibility and consistency, which can be helpful in some situations when rigorous protocol observance is required. Given this, transactional leadership may be helpful in the implementation phase of management innovation (Vaccaro et al., 2012).

Although transformational and transactional leadership styles have their strengths, their impact on innovation management is very different. Transformational

leadership promotes a culture of creativity and innovation in the long term, while transactional leadership ensures stability and efficiency and focuses on short-term success.

A balanced approach that integrates elements of both styles can be ideal, leveraging the strengths of each to drive innovation while maintaining stability within the organization.

In essence, the theoretical conclusions derived from this study essentially support a thorough integration of diverse leadership styles with innovation management principles. This integration is important for organizations striving to thrive in the modern business landscape characterized by relentless change and fierce competition. In an era characterized by constant evolution and dynamic market movements, organizations can overcome barriers, create resilience, and achieve sustained success by coordinating visionary leadership, structured frameworks, and innovation-driven practices.

7 Conclusions

The main purpose of this report was to delve deeper into the intricate relationship between Innovation Management and Leadership. The significance of this exploration lies not only in understanding these concepts, but also in discovering a multitude of possibilities arising from further research and application. Starting with an exploration of Innovation and Innovation Management, the initial aim was to understand these fundamental concepts and underline their profound significance in organizational frameworks.

The next phase involved a thorough analysis of the ISO 56002 standard. This standard served as a link to connect the domains of Innovation Management and Leadership. By understanding and analyzing the standard ISO 56002, it was possible to gain a comprehensive understanding of its implications towards the convergence of these disciplines.

In addition, the journey extended to an in-depth exploration of Leadership, embracing its various dimensions and fundamental principles. The focus then shifted to two distinct but impactful leadership typologies: Transformational and Transactional. These typologies, characterized by their unique attributes, offered divergent perspectives and valuable insights essential to framing this report.

Through this comprehensive exploration, a nuanced understanding of the roles played by Transformational and Transactional Leadership in the Innovation Management domain was achieved. These leadership styles were analyzed to uncover their impacts, strengths and limitations when it comes to fostering cultures of innovation, motivating teams and driving organizational change.

Ultimately, this multi-faceted approach facilitated a holistic understanding of how different leadership styles interact with Innovation Management. It emphasized the importance of leadership strategies in shaping organizational dynamics, promoting innovation and guiding entities towards achieving sustainable growth and competitiveness in today's dynamic business landscape.

The identification of innovation management as a key accelerator for organizational resilience and growth is primary among these conclusions. The report emphasizes that effective innovation management is essential for long-term success in the dynamic global environment. Businesses that embrace and value innovation are better able to adjust to changes in the market and keep a competitive advantage by constantly improving their portfolios in terms of goods, services, and operational procedures.

The effectiveness of Innovation Management is largely dependent on the significant impact of leadership styles. The two different leadership typologies studied, Transformational and Transactional Leadership, have complementary and divergent effects on organizational innovation cultures. Teams are inspired to innovate fearlessly by transformational leadership, which promotes risk-taking and visionary thinking. On the other hand, transactional leadership prioritizes adherence to customary standards, establishes defined objectives, and guarantees operational efficiency. These several leadership paradigms give organizations a variety of strategies for fostering innovation and accomplishing strategic objectives.

Moreover, the integration of these theoretical findings highlights the necessity for organizations to embrace a balanced strategy. Through the implementation of a hybrid approach that incorporates several leadership styles into the context of innovation management, organizations can foster a culture that places equal

emphasis on innovation and operational effectiveness. In addition to promoting experimentation and embracing diversity of opinion, this hybrid approach gives teams the freedom to innovate without interference as long as stability and strategic goals are met.

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