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## **DIGITAL INNOVATION AS A PATH TO ORGANIZATIONAL PERPETUITY: STRATEGIC MANAGEMENT IN THE AGE OF ARTIFICIAL INTELLIGENCE**

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***Kleber de Britto Souza***

IFAM - Parintins Campus

***Alexandro Guimarães de Souza***

IFAM - Parintins Campus

***Ricardo Santos Fonseca***

IFAM - Parintins Campus

***Euderley de Castro Nunes***

IFAM - Parintins Campus

***Valdomiro Lopes dos Santos Neto***

IFAM - Parintins Campus



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**Abstract:** This research aims to analyze the importance of digital innovation as an essential strategy for the survival and competitiveness of organizations in the era of Industry 4.0. Digital transformation and the emergence of disruptive technologies have led to profound changes in business models, working relationships and management practices. In this scenario, innovation is no longer just a differentiator but a requirement for business continuity. Based on a literature review, the study looks at the main innovation models, with emphasis on open innovation and the Tidd, Bessant and Pavitt model, as well as highlighting the challenges faced by Brazilian companies, such as resistance to change and lack of investment. Innovation management (IM) emerges as a strategic tool for aligning innovative actions with organizational objectives, promoting collaborative, creative and sustainable environments. The role of leadership is emphasized as decisive in building an organizational culture that fosters continuous innovation. It also discusses how the digital transformation directly impacts internal processes and market dynamics, requiring organizations to be able to adapt, make strategic use of data and integrate with external networks. The final considerations point out that the integration of innovation management and digital transformation is indispensable for the future of organizations. Companies that understand this new paradigm and adopt strategies based on technology, collaboration and creativity will be better prepared to face the challenges of the digital economy and achieve sustainable competitive advantage.

**Keywords:** Digital innovation. Innovation management. Digital transformation.

## INTRODUCTION

We live in an era marked by profound and accelerated transformations driven by the advance of digital technology. The so-called

Fourth Industrial Revolution, or Industry 4.0, has reshaped the foundations on which traditional organizational models were built. This new digital era is not limited to technological innovations, but also involves a reconfiguration of the social, economic and productive dynamics that shape the way organizations function. The impact of artificial intelligence, the Internet of Things (IoT), cloud computing, big data and automation is being felt in all sectors of the economy, requiring a strategic response from institutions.

In this scenario, it is clear that innovation is no longer an optional competitive advantage, but an indispensable condition for the survival and continuity of organizations. Companies that fail to adapt to new technological requirements run the risk of becoming obsolete in an increasingly competitive, dynamic and data-driven market. Digital transformation, therefore, is not just an update of tools or systems, but a structural change in the management model and organizational culture, demanding strategic vision, flexibility and a willingness to innovate from leaders.

In addition, the Covid-19 pandemic has further accelerated this transformation. Remote working, e-commerce, digital services and the use of virtual communication and collaboration platforms have gone from being trends to becoming common practice. This reality has highlighted the importance of digitizing organizational processes and adopting an innovative mindset capable of dealing with the volatility, uncertainty, complexity and ambiguity that characterize the current environment.

Innovation, in this context, must be understood as a continuous process integrated into the organizational strategy. It is not limited to the development of new products or services, but also encompasses changes in processes, business models, distribution channels, forms of relationship with customers and suppliers, among other aspects. The concept of open

innovation, which values collaboration with external agents such as startups, universities, research centers and even competitors, is gaining strength in this scenario of transformation and connectivity.

Innovation management, in turn, is emerging as a fundamental discipline for coordinating and boosting this process. It involves planning, organizing, leading and controlling innovative activities within the company, ensuring that innovation efforts are aligned with strategic objectives and that available resources are used efficiently. It's about creating an environment conducive to creativity, continuous learning, experimentation and calculated risk-taking.

Recent literature points to various models and tools that can be used by organizations to structure innovation management, such as the linear, parallel, Tidd and Bessant models and the open innovation model. Each of these models has specific characteristics that suit different types of companies and market contexts. Understanding these approaches is essential so that managers can select and adapt those that best meet the needs of their organizations.

This article therefore aims to analyse, in the light of contemporary literature, how innovation management can be implemented strategically within organizations in the digital age, highlighting innovation models, challenges, opportunities and the impact of Industry 4.0. The aim is to understand how companies can use innovation as a tool to remain relevant, competitive and sustainable in a constantly changing environment. The approach adopted is intended to provide theoretical and practical support for managers, entrepreneurs and scholars who wish to deepen their knowledge of the subject and apply the principles of digital innovation in their organizational contexts.

## **THEORETICAL FRAMEWORK**

According to Santiago (2021), innovation can be understood as the implementation of new solutions that add value to organizations, whether through products, services, processes or business models. In this sense, Bignetti (2002) argues that innovation should be understood as a spiral process, based on the constant interaction between technology, strategic planning and creativity. In a highly competitive and connected world, the ability to innovate has become one of the main differentiators for maintaining and expanding businesses.

## **INNOVATION MODELS AND THEIR ORGANIZATIONAL RELEVANCE**

The specialized literature presents different models of innovation that contribute to structuring strategic thinking and organizational management. The linear model, considered one of the most traditional, is based on a logical and chained sequence of stages: from basic research to applied research, through technological development to commercialization (CONDE; ARAÚJO-JORGE, 2003). Despite being criticized for its rigidity and lack of openness to feedback, this model still finds application in highly predictable industrial sectors.

In response to the limitations of the linear model, the parallel model has emerged which, although it maintains a sequential structure, allows for greater interaction between the stages of the process, promoting a feedback system between research, development and the market (LIMA, 2020). This approach favors dynamism and adaptation to rapid changes in the external environment.

Another widely adopted model is that of Tidd, Bessant and Pavitt, which organizes innovation into four fundamental stages: search (looking for opportunities), selection (choosing promising ideas), implementation (executing the innovation) and learning (analy-

zing results for continuous improvement) (CENTURIÓN et al., 2015). It is a cyclical model that favours the generation of organizational knowledge.

Complementing this perspective, the open innovation model stands out for its flexibility and openness to external contributions. First proposed by Chesbrough, this model breaks with the tradition of developing all innovations internally and recognizes the value of partnerships with universities, research institutions, startups and other companies (FAVARIN; PINTO, 2009). Open innovation favors accelerating results and reducing risks through collaboration.

## **INDUSTRY 4.0 AND DIGITAL INNOVATION AS A STRATEGY**

The advent of Industry 4.0 represents a paradigm shift in the way organizations generate value. Based on the integration of digital technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), big data analysis and cyber-physical systems, this new industrial phase is profoundly transforming production processes and business models.

For Lopes (2024), digital transformation is no longer a strategic option but an organizational imperative. Companies that don't adapt quickly to new technologies are doomed to lose relevance in an increasingly competitive market. Industry 4.0 requires organizations to act based on data, connectivity, automation and personalization at scale.

In this context, innovation management takes on an even more important role. According to Silva (2022), it consists of the organizational capacity to mobilize and integrate resources to foster innovation in a structured and systemic way. Sebrae (2021) reinforces that IM is an essential tool for transforming ideas into concrete actions, with the potential to generate competitive advantage and long-term sustainability.

The adoption of digital technologies also influences organizational culture. According to Silva, Martins and Weiler (2023), for innovation to take place, leaders need to be committed to creating an environment that is conducive to creativity, learning and employee autonomy. Thus, innovation should not be understood as an end in itself, but as a means of creating value in complex and constantly changing environments.

## **ANALYSIS AND DISCUSSION**

The digital revolution has caused profound and irreversible transformations in the forms of production, consumption, interaction and management within organizations. This new reality, driven by emerging technologies such as artificial intelligence, the internet of things, blockchain and big data, imposes an urgent need for companies to constantly adapt. As pointed out by Santos et al. (2018), today's global competitiveness forces innovation to become an essential condition for organizations to remain in the market, especially in sectors that are traditionally resistant to change.

Adopting innovation as an organizational strategy is not just about acquiring advanced technologies, but a structural and cultural change that repositions the company in the contemporary business ecosystem. In this sense, the open innovation model is gaining prominence, especially because of its potential to integrate internal and external environments. According to Favarin and Pinto (2009), this approach allows ideas and solutions to flow between companies, research institutions, startups and even clients, shortening development cycles and promoting greater agility in the delivery of value. Souza and Brambilla (2021) classify it as a strategic tool for generating value or as a means of creating new products and services.

The practice of open innovation is aligned with the spirit of digital transformation,

which presupposes interconnectivity, collaboration and flexibility. This integration breaks with the traditional logic of innovation centered exclusively on internal R&D (research and development) departments and opens up space for co-innovation with various market players. By sharing knowledge and resources, organizations are able to take advantage of collaborative networks capable of speeding up the generation of solutions and responding more quickly to market demands.

In addition, the Tidd, Bessant and Pavitt model (CENTURIÓN et al., 2015) is a powerful tool for supporting systemic and continuous innovation within companies. By adopting a structure based on the stages of search, selection, implementation and learning, the model provides a constant feedback loop that allows the organization to adjust its practices and incorporate new ideas effectively. Such an approach is particularly valuable in an environment of rapid change, as it encourages incremental and disruptive innovation from a structured process.

However, implementing innovative models within organizations requires more than well-defined processes; above all, it requires an enabling organizational culture. As Silva, Martins and Weiler (2023) emphasize, for innovation to flourish, it is essential that leaders cultivate creative, collaborative and risk-taking environments. This means abandoning rigid hierarchical structures and fostering a spirit of experimentation, in which mistakes are understood as part of the learning process.

A culture of innovation is closely linked to empowering employees and encouraging critical thinking. Companies that create a safe psychological environment for proposing ideas and that recognize the value of a diversity of perspectives tend to excel in terms of innovation. To this end, the role of leadership is decisive: managers must act as facilitators of innovation, encouraging autonomy, collaboration between areas and continuous learning.

Industry 4.0, with its multiple integrated technologies, poses additional challenges to traditional organizational structures. Melek and Boskovic (2019) state that these technologies are reshaping not only the production model, but also employee well-being and management practices. Remote working, intelligent production systems and the automation of tasks require new skills from workers, as well as completely rethinking the people management model. In parallel, Bambini and Bonacelli (2024) point out that the reconfiguration of innovation players has made the ecosystem more fluid and interdependent, requiring companies to adapt to constant technological and market changes.

In the Brazilian context, the road to innovation faces significant barriers. Resistance to change, combined with the scarcity of resources and investment in R&D, compromises the competitiveness of national companies. According to Cubo Itaú (2023), the main obstacles to the full adoption of innovation in organizations include the difficulty of retaining talent, the lack of incentive policies and the fear of failure in innovative initiatives. In this uncertain environment, it becomes even more urgent for innovation management (IM) to be adopted as a structuring strategy and not just as a set of isolated initiatives.

When integrated into strategic planning, IM makes it possible to align innovation objectives with the results expected by the organization. According to Silva (2022), managing innovation involves the coordinated mobilization of human, financial and technological resources, with a view to promoting sustainable, results-oriented transformations. Sebrae (2021) reinforces this understanding by highlighting that IM is essential for structuring and operationalizing ideas, promoting the transition from creativity to effective action.

Another point worth highlighting in the discussion of digital innovation is the importance of data as a strategic input. The ability



to collect, analyze and transform data into useful knowledge sets the most innovative organizations apart. Market intelligence based on data makes it possible not only to predict consumer behavior, but also to develop products and services that are more in line with their needs. Data analysis thus becomes a core competency for innovation, increasing the company's ability to respond to changes in the external environment.

In this way, we can see that digital transformation and innovation management should not be seen as independent initiatives, but as complementary and inseparable elements in the process of organizational evolution. The synergy between technology, organizational culture and well-structured innovation models creates the ideal conditions for companies to face the challenges of the 21st century with resilience, agility and relevance.

Therefore, organizations wishing to remain competitive and relevant must understand that innovation is not a one-off event, but a systemic and continuous process. This process requires planning, investment, a favorable culture, inspiring leadership and integration with the digital ecosystem. Only through this articulated set of actions will innovation be consolidated as a key element for organizational longevity and sustainability.

## FINAL CONSIDERATIONS

Digital innovation has become a central element for the success and sustainability of organizations in the 21st century. It is no longer a strategic alternative or a possible competitive advantage, but an imposition of the globalized and digitally connected market itself. In this context, understanding the different models of innovation, developing an organizational culture conducive to creativity and collaboration, and applying efficient innovation management practices are indispensable attitudes for those organizations that wish not

only to survive, but to thrive in volatile and highly competitive environments.

The analysis presented throughout this study shows that innovation, when well managed, is capable of transforming ideas into concrete results, driving the generation of value for customers, employees, partners and society as a whole. Models such as Tidd, Bessant and Pavitt's, as well as open innovation, show that there are viable and adaptable methodological paths for systematizing the innovation process, allowing companies to act in a more agile, flexible way and in line with emerging demands.

In addition, digital transformation brings with it the need to restructure processes, redefine skills and bring about a profound cultural change in organizations. Technologies such as artificial intelligence, the internet of things and big data not only optimize tasks and processes, but require new ways of thinking, leading and deciding. In this sense, the integration of digital transformation and innovation management should not be treated in isolation, but as part of the same strategy of continuous and evolutionary adaptation.

Another important point is the role of leadership in building innovative environments. Innovative leaders not only support technological initiatives, but are responsible for promoting a mentality that is open to experimentation, to mistakes as learning and to team autonomy. The organizational culture must encourage creativity, the sharing of ideas and collaborative work, creating safe spaces for innovation to emerge naturally.

It is also important to recognize the specific challenges faced by countries like Brazil, where factors such as resistance to change, lack of investment in R&D, lack of consistent public policies and structural difficulties still limit the adoption of a full innovation culture. However, even in the face of these obstacles, success stories show that with strategic planning, leadership commitment and coordina-

tion with the external ecosystem, it is possible to move towards a more innovative and competitive economy.

In this way, innovation management emerges as an essential articulation mechanism for companies to safely navigate the changes brought about by Industry 4.0 and digitalization. Based on the literature analyzed, it can be seen that the adoption of innovation as a strategic axis enables gains in productivity, competitiveness and long-term sustainability.

The future of organizations is directly linked to their ability to reinvent themselves in the face of constant market transformations. Tho-

se who understand that innovation is no longer a choice, but a vital necessity, will be better placed to face the challenges and exploit the opportunities of the new digital economy.

Therefore, this article reinforces the importance of a holistic and integrated view of digital innovation, proposing that managers, researchers and public policy makers move forward in building organizational and institutional environments that are more conducive to innovation, promoting not only economic growth, but also social and human development sustained by creativity, collaboration and technology.

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