

# Design Thinking as an Approach to Innovation

## *El Pensamiento de Diseño como una aproximación a la innovación*

**Abstract.** The complex and vigorous discussion of how organizations innovate is undoubtedly relevant to the academic world of business and management practice. It provides space for diverse and broad points of view on the strategies, processes, and practices that allow us to face the challenges of the current environment and increase the probability of obtaining better business performance in the future. Design Thinking is widely acknowledged as a powerful approach to innovation in both professional and academic settings, though its interpretations differ. It has been examined in various ways —as a tool, a practice, a skill, and a mindset— sparking ongoing discussions about its core essence. This article seeks to illustrate (i) how this concept has crossed over from the traditional discipline of design to influence the world of business management, (ii) what criticisms are present in the academic and practice debate, and finally (iii) addresses the main processes and practices that permit firms and organizations to refer to it as an approach to innovation. *Keywords:* Design Thinking, innovation management, innovation processes, design, strategy

**Resumen.** La compleja y vigorosa discusión sobre cómo innovan las organizaciones es sin duda relevante para el mundo académico, de los negocios y la práctica gerencial. Esta, da espacio para diversos y amplios puntos de vistas sobre las estrategias, procesos y prácticas que permiten enfrentar los desafíos del entorno del presente y aumentar la probabilidad de obtener un mejor desempeño de los negocios en el futuro. El *Design Thinking* (Pensamiento de Diseño) es ampliamente reconocido como un poderoso enfoque para la innovación tanto en el ámbito profesional como académico, aunque sus interpretaciones difieren. Se lo ha examinado de diversas maneras —como herramienta, práctica, habilidad y mentalidad—, lo que ha generado debates continuos sobre su esencia central. Este artículo tiene por propósito ilustrar (i) cómo este concepto traspasó desde la disciplina tradicional del diseño para incidir en el mundo de la gestión empresarial, (ii) cuáles son las críticas presentes en el debate académico y práctico, y por último (iii) aborda los principales procesos y prácticas que permiten referirnos a él como una aproximación a la innovación. *Palabras clave:* Pensamiento de Diseño, gestión de innovación, procesos de innovación, diseño, estrategia

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Fecha de recepción: 14/03/2025

Fecha de aceptación: 04/11/2025

Cómo citar: Rebollo Díaz, M. C. (2025).

Design Thinking as an Approach to Innovation.

RChD: creación y pensamiento, 10(19), 1-11.

<https://doi.org/10.5354/0719-837X.2025.78117>

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RChD: creación y pensamiento

Universidad de Chile

2025, 10(19).

<http://rchd.uchile.cl>

## Navigating Challenges and Uncertainty

The accelerated pace of social, technological, and economic changes present in the configuration of the world from the phenomenon of globalization and the industrial revolution 4.0 —Globalization 4.0— (Schwab, 2018) leads to complex scenarios related to new norms, standards, policies, and agreements that must be achieved. This represents a challenge for companies and organizations that must embrace a dynamic attitude, make decisions, and change to overcome today's crises and face uncertainty. This is not an easy task for leaders as it is fraught with dilemmas related to the knowledge of problem-solving, value creation, and how to respond effectively to lead change and disruption; we must recognize that the new reality urgently demands that the best capabilities should be mobilized, as these are key to the responses and solutions to regenerate the present and create new futures.

Extensive evidence conducted in different regions of the world supports the expected positive relationship between company performance and innovation (OECD, 2009, 2015; Crespi & Zúñiga, 2012; Mardones & Zapata, 2018). Understanding the dynamics that lead to successful firm results is essential to mobilizing those seeking to unblock obstacles, improve their performance, and get out of the lag.

Given the need to accelerate the pace and get closer to developed nations, in recent years, leaders from emerging economies have seen firms and organizations from developed markets integrate new paradigms to face problems and innovate with successful results. Design Thinking (DT) is a creative problem-solving method based on the application of mindsets, processes, and tools of designers to the business context (Dewett, 2007; Brown, 2008) and has gained popularity in management, helping address today's conflicts and create new opportunities for the future. Leaders and teams are increasingly adopting this approach to innovation; however, its implementation and use by managers call for further understanding.

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At the heart of this article is the question: What is the relationship between design and innovation? To address this, we will (i) explore the intersection between these disciplines, (ii) conduct a critical analysis from both academic and practical perspectives, and finally (iii) describe the practices and processes involved.

To conduct this qualitative-theoretical exploration, high-quality resources were prioritized. Based on the criterion of relevance, a comprehensive review of the literature on design and innovation was conducted, and articles from highly cited journals and books by authors widely recognized as authorities in the world of business management were selected.

Thinking in the context of business innovation management. By exploring the relationship between these disciplines, it seeks to illustrate the dynamics that firms employ under this paradigm. This knowledge is valuable for organizations striving for innovation; in particular, managers will benefit from gaining an overview of these topics and a critical analysis of their key aspects.

## Emergence of Design Thinking

The discipline of design began as a result of the needs of the Industrial Revolution. It can be associated with concepts such as creativity, aesthetics, and functionality. According to the Design Council, design is what happens when people use creativity to solve problems. The contemporary vision of this discipline is impregnated with the heritage of a school known as the Bauhaus, a German art school (1919 to 1933) that combined crafts and fine arts. The school gained acknowledgment for its approach to design. It attempted to unify an artistic vision with the principles of mass production, emphasizing functionality. This theoretical and practical tradition is still present in the training of everyone who seeks to become a designer and is the basis of every design school.

For decades, the importance of design as a source of value creation has been the subject of study. Buchanan (1992) synthesized the *four orders of design*, illustrating how design as a discipline has moved from the traditional concept of the visual or tangible artifact to the orchestration of interactions and experiences and the transformation of systems; his model demonstrates the scope and role that design can play for organizations.

Kolko (2010) describes the design process as a way to organize complexity, which is achieved through synthesis. Synthesis involves organizing and making sense of complex or chaotic information to create cohesion and clarity. Designers employ abductive reasoning, which involves prioritizing, judging, and connecting data to create relationships and generate new knowledge. The author proposes three methods as approaches to addressing problems: (i) **Reframing**: Changing the perspective of the problem to discover new relationships and constraints; (ii) **Concept Mapping**: Visually organizing knowledge and relationships between concepts to facilitate understanding; and (iii) **Insight Combination**: Merging observations and design patterns to generate innovative new ideas. The structured application of these methods improves the systematization, formalization, and value of synthesis, making the process repeatable and scalable—a fundamental basis for driving innovation—.

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We know that in the 90s, the concept of DT started to be acknowledged, disrupting the designer community since this concept was not forged within design schools. To this end, DT, *by name*, is at least 80 years old and was conceived as something organizations do to be innovative (Pitsis et al., 2020, p. 1). Since the early 2000s, the intersection between DT and management has gained attention (Martin, 2009), popularized by the consulting firm IDEO, Stanford University from 1957 to 2005 and firms in the United States (Wong, 2009), the diffusion of the term improved communication between designers and business partners to help explain what designers do and how these practices might be shared and utilized across functions within organizations (Appleyard et al., 2020, p. 13). The use of this concept in strategic consulting practices has positioned it as a set of approaches and tools to deal with business problems and challenges (Brown, 2008; Brown & Katz, 2011; Dorst, 2011; Martin, 2009; Liedtka & Ogilvie, 2011), reaching Business Schools and the curriculum for the training of new managers (Glen et al., 2015).

Nowadays, design approaches and practices are being used as a force for change, enabling companies to tackle some of the toughest economic and management challenges. Verganti (2009) refers to Design-driven Innovation as an enabler, a form of radical innovation. Design-driven organizations have integrated design and DT into most of their organizational practices (Beverland & Farrelly, 2007), believing that design and DT are at the heart of value generation and sustainable competitive advantage (Björklund et al., 2020). Knight et al. (2020) extend this perspective further, integrating DT with strategic planning, referring to this as a design-led strategy, showing that the content and practices of DT can be used for strategic management. Dorst (2011) refers to DT as an exciting paradigm —approaches and methodologies— for dealing with problems in many application domains. Similarly, Kolko (2015) argues that the concept of DT has reached maturity, evolving from an approach primarily used in product design to a set of principles that have permeated corporate culture and are now closer to the core of the organization.

Aligned with the interest that exists in the relationship between the contexts that intersect design, innovation, and management, DT has emerged as a multidisciplinary concept that has achieved dissemination and has been adopted by contemporary firms from different industries with successful results, such as 3M, Google, PepsiCo, SAP, IBM, among others. Accenture, Deloitte, IBM, KPMG, and Price Waterhouse Coopers rank among the most aggressive players in acquiring design agencies to renew their offers and revive their innovation services (Dell’Era et al., 2018, p. 325). These practical cases reflect that DT is proposed not only as an approach to design but also as an alternative way to practice innovation in an organized context. In other words, DT is a paradigm for innovation management.

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### Facing Design Thinking Critiques

Buchanan (1992), widely referenced by academics to date for early identification of *wicked problems* in DT, states that there are challenges to obtaining a deep understanding of what DT is and the possibilities to influence other disciplines; for more than 20 years a wide variety of research from the fields of DT and management has been presented in conferences, papers, journal articles, and books that suggest that it continues to expand its meaning and connections, revealing unexpected dimensions for practice as well as for understanding (Boland & Collopy, 2004; Verganti et al., 2021).

Despite the successful results in management practice and the recognition of the role of DT as a driver of innovation, the concept has not been popular in theory. In a recent critical review and analysis of this concept, Verganti et al. (2021) identify that the rapid diffusion of DT in practice has not been coupled with similarly rapid and robust development of its theoretical underpinnings. The literature related to the study of DT has provided fragmented, partial, and ambiguous definitions (Carlgrén et al., 2016), contributing in a limited way to its understanding, preventing the concept from being captured to clearly explain why and how it impacts the practice of management and innovation. Other researchers have extended these criticisms, such as Badke-Schaub et al. (2010), who envision its dilution

to meaninglessness, and Johansson-Sköldberg et al. (2013), who question its nature due to the disconnection of the concepts of DT and design. Criticisms emerging, particularly from the design community, see DT as an oversimplified and unconvincing version (Iskander, 2018). Academics have not yet agreed on a unified definition of this concept.

Not only does this concept face theoretical criticism, but it is also the subject of controversy even for practitioners and advocates (Liedtka, 2015) because the definitions used are context-dependent, as are the models that represent it as a process, for example, more and more companies claim they have created their own DT approach or have incorporated it in their own practices (e.g., SAP, Dell, IBM) (Dell'Era et al., 2018, p. 325). The ambiguity of the value that this concept promotes, its diffuse definition, its ambiguous parameters, its lack of appropriate metrics, and its long distance from the market are characteristics that continue to limit its understanding of how it supports innovation in organizations (Rauth et al., 2014).

Although research with theoretical and practical orientations seeks to delve into its empirical depth, these efforts reflect the vital presence of this concept in both education and the practice of management. A significant number of scholars search in the gaps and questions, an opportunity to contribute with its understanding and legitimacy and demonstrating that this concept is constantly evolving (Beckman & Barry, 2007; Martin, 2009; Dorst, 2011; Liedtka, 2000, 2020; Liedtka et al., 2013; Micheli et al., 2019; Dell'Era et al., 2020; Verganti et al., 2021; Magistretti et al., 2021; among others).

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### **Design Thinking as a Process/Practice**

In the search for different approaches to innovation, for only a couple of decades, there has been an emerging and growing interest in the relationship between management and the discipline of design (Bruce & Bessant, 2002; Brown, 2008; Verganti, 2009; Liedtka, 2018). This intersection has captured the interest of researchers because it provides a different logic to deal with complex and ambiguous issues and fosters innovation (Bruce & Bessant, 2002; Magistretti et al., 2021). It has also captured the interest of practitioners because it has become a strategic approach to innovation (Knapp et al., 2016). Brown (2008) and Cross (2023) propose that designer skills can be developed by everyone, indicating that tasks and practices should not only be carried out by trained designers but by anyone within an organization seeking to innovate, those who can be called *design thinkers*.

While its definitions vary, DT can be conceived as a methodology that enables creative mindsets, broadening the scope of product innovation to encompass functionality and meaning (Klenner et al., 2022), pushing further DT is accepted as a formal creative problem-solving method fostering innovation (Brown, 2008; Liedtka, 2018; Liedtka et al., 2013; Martin, 2009; Dell'Era et al., 2020). The intervention of academic institutions led to the representation of DT as a process that organizations can use, where a series of practices and tools must be enabled. In a review of 104 academic articles published by Micheli et al. (2019), the most influential and cited models are

Table 1

*Most influential applied models of Design Thinking*

Note: Based on Micheli et al. (2019).

Proponent	Main stages of Design Thinking
IDEO	Inspiration, ideation, implementation
Stanford Design School	Empathy, define, ideate, prototype, and test
IBM	Understand, explore, prototype, evaluate

identified, where we can find that the representation of the DT process is not generic and not just one; however, the stages tend to be repeated between models with existing similarities (Table 1).

To face the difficulty represented by the ambiguity of this concept, Carlgren et al. (2016), based on empirical research in six large firms, propose the structure of a DT framework with five central themes associated with the principles/mindsets, practices, and techniques, which allows conducting research in theory and practice. On the other hand, Micheli et al. (2019), in a systematic and comprehensive review of the literature, identified ten key attributes and eight tools that provide clarity and validity to the constructs associated with DT. Both works were unified by Dell'Era et al. (2020) in a new framework that consolidates and provides the practices that entail different interpretations of this paradigm. These concepts were empirically tested by the authors to identify configurations of these DT practices that are used to address different innovation project goals and levels of uncertainty (Dell'Era et al., 2025). The key themes and primary practices are defined below, based on the authors' empirical and bibliographic research (Table 2).

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Table 2

*Main practices of Design Thinking*

Note: Based on Dell'Era et al. (2020), adapted from Carlgren et al. (2016) and Micheli et al. (2019).

**Human-centered design:** DT relies on a human-centered approach at its core. It starts with users, culminating in crafting a custom solution tailored to meet customer requirements. Establishing empathy through observation and ethnographic study of those for whom the design is intended, which is aimed at addressing issues from their viewpoint. When tackling problems, teams must extend beyond boundaries, exploring scenarios extensively to ensure they address the right questions.

Theme	Practices	Main references
Human-centered design	<ul style="list-style-type: none"> <li>• Involving users</li> <li>• Empathizing with humans</li> </ul>	Brown (2008), Michlewski (2008), Holloway (2009), Ward et al. (2009), Dell'Era et al. (2018)
Problem framing	<ul style="list-style-type: none"> <li>• Framing and reframing</li> <li>• Abductive reasoning</li> <li>• Embracing ambiguity</li> </ul>	Boland & Collopy (2004), Dew (2007), Drews (2009), Fraser (2009), Lockwood (2009), Martin (2009), Kolko (2010), Dorst (2011)
Diversity	<ul style="list-style-type: none"> <li>• Integrative thinking</li> <li>• Holistic thinking</li> <li>• Interdisciplinary collaboration</li> </ul>	Dunne & Martin (2006), Brown (2008), Fraser (2009), Sato (2009), Beverland et al. (2016), Luchs et al. (2016)
Experimentation	<ul style="list-style-type: none"> <li>• Learning by doing</li> <li>• Failing often and soon</li> <li>• Diverging/Converging</li> </ul>	Boland & Collopy (2004), Brown (2008), Drews (2009), Fraser (2009), Holloway (2009), Sato et al. (2010)
Visualization	<ul style="list-style-type: none"> <li>• Making ideas and insights visual and tangible</li> <li>• Representing abstract concepts</li> </ul>	Carr et al. (2010), Drews (2009), Ward et al. (2009)

**Problem framing:** This activity holds immense importance within the realm of DT; challenging the problem statement is not confined to the initial stages; instead, it remains an ongoing endeavor until the completion of the work. Abductive reasoning is employed, a method centered on envisioning what could be rather than analyzing what currently exists to generate new insights and knowledge. Embracing ambiguity becomes a defining trait of teams, navigating iterative cycles of trial-and-error experiments; moreover, failure is not viewed negatively within this willingness to embrace ambiguity but rather as a catalyst for progress.

**Diversity:** Innovation thrives at the intersection of technical, business, and human aspects; diversity is crucial. Integrative thinking, merging conflicting ideas or models, paves the way for creative problem-solving. Effective DT relies on a profound comprehension of the problem, achievable by addressing customer needs, user environment, social elements, and emerging trends; hence, adopting DT requires holistic consideration, analyzing every aspect of the problem to resolve. Collaborating across disciplines supports the fusion of diverse perspectives within and outside the organization. It requires collaborating with people from different fields and departments to approach problems from fresh and diverse angles.

**Experimentation:** Learning by doing relies on experimentation. Transforming abstract concepts into something tangible empowers teams to test, effectively communicate concepts to others, and gather valuable feedback; this enables exploration through the iterative refinement of prototypes. Embracing a trial-and-error approach helps tackle problems to achieve innovative solutions, experimenting with new approaches and engaging users and stakeholders in exploring novel scenarios. In nurturing creativity, the DT process typically initiates a divergent phase to generate multiple ideas to reframe the problem and uncover potential pathways to solutions. Subsequently, these options are narrowed down in the convergent phase to develop the most promising.

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**Visualization:** Representing ideas and insights in visual and tangible forms boosts the efficacy and efficiency of designing new solutions. Employing a visual approach facilitates the comprehension of abstract concepts, unveiling the multitude of aspects concealed within the ambiguity of mere words.

From a managerial perspective, these frameworks offer a comprehensive and refined view of the DT process and practices, allowing us to clarify the diffuse and different interpretations in the literature. As a result, a practice-based (performative) approach seems ideal for exploring DT as an approach to enabling innovation. Specifically, considering DT as a process and as a set of practices allows us to examine how it plays out in organizational contexts while addressing its broader and more universally applicable elements.

## Final Discussion

Through this exploratory analysis, we have been able to understand in depth that DT is presented to business management as a paradigm that enables innovation in companies and organizations. It helps them creatively deal

with complex challenges and problems by connecting strategic planning with practices that favor the creation of value for the present and the future. The findings suggest that business management practitioners will benefit from understanding the core practices that comprise it and that are transversal to the model or type of process they adopt.

This article has also addressed some of the criticisms that this concept faces, recognizing that researchers still propose different interpretations and have not managed to agree on a unified definition; the lack of clarity and ambiguity still leaves many questions unanswered; still, despite the fragmented literature related to DT, the number of articles and publications on the subject continues to grow and a vigorous debate continues to capture the attention of academics and practitioners of business management due to how successful it has proven to be in helping firms and organizations navigate challenges and uncertainty and improve their performance.

Finally, since this article is limited to a literature review, it does not provide empirical evidence. This may open opportunities for future research by generating in-depth case studies that directly observe the interpretation and incorporation of design practices in relation to innovation, particularly in contexts such as emerging economies, specific industry categories, or niche markets.

### **Funding**

Durham DBA Scholarship Award.

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### **Conflict of Interest**

The author has no conflicts of interest to declare.

### **Authorship Statement**

María Constanza Rebolledo Díaz: conceptualization, research, methodology, writing-original draft, writing-revision, and editing.

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