

# **Design Thinking as an Approach for Product and Service Innovation: A Study on its Application in Brazilian Companies**

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## **Abstract**

Design Thinking is a user-centered approach for developing creative and innovative solutions. This project investigated the application of this approach in Brazil in the development of products and services in Brazilian companies, identifying adoption levels, barriers, and perceived benefits. The methodology used a mixed approach combining a literature review, mapping of courses and consultancies, an expert interview, and a survey with professionals from Brazilian organizations. The results indicate that, despite the growing availability of training, there is resistance to the term and widespread lack of awareness of DT in the Brazilian corporate environment. The study revealed that most participants are not familiar with the methodology, and among those who are, use is still limited, with brainstorming being commonly the most employed tool. These findings suggest that Design Thinking is an emerging approach in Brazil, facing challenges in its diffusion and implementation, which underscores the need for strategies to promote broader understanding and application.

## **Keywords**

Design Thinking, innovation, Brazilian companies, organizational barriers, agile methodologies

## **1. Introduction**

Innovation and the development of new products and services have become increasingly essential for firms to remain competitive in a constantly changing market. Offering a quality product or adopting high-performance technologies is no longer sufficient to secure a competitive advantage. In today's business environment, marked by rapid change and intense global competition, innovation is no longer merely a differentiator; it has become a prerequisite for organizational survival and growth.

In this context, understanding customers' real needs is fundamental, since value is ultimately created for them. Design Thinking (DT) emerges as an approach that supports organizations in the innovation process by placing the user at the center of creativity and integrating multidisciplinary methods to solve complex problems and develop novel solutions (Brown, 2008). The methodology relies on principles such as empathy, experimentation, and collaboration to deeply understand user needs and to develop iterative solutions (Micheli et al., 2019).

Brown (2008) describes DT as a human-centered, prototype-driven approach organized into five interconnected stages: empathize, define, ideate, prototype, and implementation, in which multidisciplinary teams explore possibilities, build and test solutions, and learn through direct contact with users and real contexts. Over recent

decades, DT has expanded from product design to innovation management and organizational transformation, with educational traditions associated with Stanford and IDEO (Auernhammer; Roth, 2021).

Active listening to customers is the starting point of DT because it enables a deep understanding of people's needs, behaviors, and perspectives, leading to solutions that truly add value (Micheli et al., 2019). When such listening translates into practical learning, firms can convert insights into innovation, turning discoveries into concrete product or service decisions. In this sense, listening guides rapid prototyping and testing and help prioritize what truly addresses the problem.

Despite its potential and growth on the global stage, adoption in Latin America and Brazil remains largely underexplored and faces barriers. Published research are still considered insufficient, exploring known classic cases in contexts outside of Latin America (Gentil, Bentuci, and Araújo, 2021) and some specific applications (Espitia, 2025), for example. Exploratory research, such as that conducted by Monachi and Pacheco (2023) in microenterprises in Argentina and Colombia, are scarce. Reasons for the frequent misapplication of DT are diverse; a key obstacle is the lack of knowledge about the methodology among managers and employees, which limits its strategic use in organizations (Elsbach; Stigliani, 2018; Micheli et al., 2019).

Within this context, this article presents the results of an exploratory analysis that characterizes the current use of DT in product and service development in Brazilian companies and examines the constraints on adoption as well as the degree of acceptance and resistance to the method in Brazil.

## **2. Literature Review**

Design Thinking is a human-centered approach that seeks to deeply understand users' needs, behaviors, pains, and desires to generate creative and innovative solutions. Its concept emerged at Stanford University in 1968 as a proposal focused on product design, developed by a team led by Robert McKim, founder of the Product Design department. McKim argued that design should be taught as a problem-solving process and therefore structure a methodology guided by users' real needs.

Since then, David Kelley, founder of the design firm IDEO, along with Mike Nuttall, Bill Moggridge, and their team, began applying the Design Thinking approach to problem-solving in different sectors such as technology, health, and financial services. Over time, this practice evolved and consolidated as a broader problem-solving method capable of being applied in various areas (Auerhammer; Roth, 2021).

Carlgren and BenMahmoud-Jouini (2022) state that Design Thinking is based on an iterative and collaborative process that involves rapid prototyping and solution testing to learn from users and refine ideas. According to Brown (2008), the application of this approach generally occurs in five phases: empathy/discovery of user needs, definition and synthesis of collected information, ideation, prototyping, and finally, implementation. The stages are interconnected and form an iterative cycle of discovery and creation. These stages pass through specific moments of convergence and divergence in the creative process, potentially generating different results according to the context in which it is applied.

The first stage, empathy, consists of understanding the user's needs, desires, and expectations, applying methods such as field observation of potential user behavior, interviews, and data analysis. This immersion in the real context of use allows mapping pains and motivations and generating insights that reveal explicit and latent needs that will guide the next stages of the methodology.

It is fundamental in this stage that professionals set aside their assumptions and preconceptions to truly understand users' genuine "pains" and real needs. This deep understanding of the problem in the initial phase allows reducing uncertainties in subsequent stages since when the problem is better understood, it is possible to create more effective solutions. Thus, empathy serves as the basis of the entire methodology, as it allows for a clearer definition of the problems to be faced (Rylander; Aguiar; Amacker, 2022).

The define stage aims to clearly define the problem to be solved based on data collected in the empathy phase. In this phase, it is important to establish a clear and objective problem characterization. Tools such as creating personas and

user journey maps help define the problem more precisely. During this phase, the team needs to filter the most relevant information for users and truly understand what the main problem that needs to be solved really is.

The ideation phase follows, where the objective is to generate the maximum number of ideas possible, without initially worrying about their viability. This stage seeks to expand possibilities through collaboration between people from different areas. Techniques such as brainstorming, mind maps, co-creation with users, and storyboards help transform ideas into concrete alternatives for discussion. The quality of this process depends on how the problem was defined and the team's ability to explore different paths before choosing the best solutions. Diversity of perspectives is essential for creative and innovative proposals to emerge.

Team diversity in terms of backgrounds, experiences, cognitive styles, and identities is an important component at this stage, as it increases the variation of hypotheses and consequently the chance of newer and more useful solutions. Diverse groups tend to question assumptions more intensely and negotiate meanings more explicitly, which improves framing quality and the robustness of ideas that will proceed to prototyping and testing (Carlgren; Ben Mahmoud-Jouini, 2022).

On the other hand, organizational culture can directly hinder the ideation stage in Design Thinking. In companies with strong hierarchy, low error tolerance, and little autonomy, there tend to be frictions that can halt the process. In these situations, people self-censor and different or less popular ideas end up being discarded before even being discussed. The result is poor, repetitive idea generation without depth. Therefore, for ideation to work well, it is necessary to ensure psychological safety, real leadership support, and clear rules that enable ideas to advance to prototyping (Wrigley; Nusem; Straker, 2020).

The prototyping phase is where ideas are analyzed and transformed into tangible solutions. Prototypes can be created in different forms, from physical mockups to digital models, thus providing a physical way to experiment and test ideas, contributing to iteration and experimentation, allowing early failures at a draft stage, in addition to serving as a communication tool between multidisciplinary teams (Brown, 2008).

In this process, it is important to maintain a flexible vision, understanding prototypes as learning tools that enable testing, adjusting, and even failing quickly and at low cost before reaching the final version. Additionally, prototyping opens space to deconstruct and reconstruct ideas, revealing new opportunities and ensuring that only tested and validated solutions advance to the next phase.

The last phase, implementation, is when solutions that have been tested and refined are ready to be put into practice. This stage may involve scaling the solution for broader adoption or bringing it to market. During implementation, organizations need to consider not only the solution itself but also how it will integrate with existing processes and organizational structures.

In practice, challenges arise when DT encounters rigid processes and established structures or clashes with organizational culture. These conflicts appear more forcefully when DT is inserted into projects guided by rigid performance and efficiency metrics, creating tension between design exploration and traditional work. Therefore, DT should not be applied as an irreversible process, but rather as an agile method with tools that adapt to context. When well implemented, with leadership support and cultural alignment, DT not only improves innovation processes but also strengthens a culture focused on experimentation and continuous learning (Elsbach; Stigliani, 2018; Rösch; Tiberius; Kraus, 2023).

### **3. Methods**

As part of the effort to meet the project objectives, a literature review was carried out, following the approach of Siddaway et al. (2019), with a focus on DT applications in product and service development as well as innovation processes. Searches were performed in the CAPES Journals Portal, Google Scholar, Scopus, and Web of Science using the keywords "Design Thinking," "implementation," "services," and "challenges," both individually and in combination. We focused on 2019–2024 and prioritized articles published in journals classified by Qualis as A1, except for sources addressing the origins of DT. Fifteen articles were identified as potentially relevant, eight of which were included in the review.

Next, we mapped companies and consultancies offering DT courses and training in Brazil based on institutional webpages, public materials, and online advertisements. The goal was to understand the diversity and scope of training offerings, providers, delivery formats (face-to-face, online, hybrid), duration and structure, and target audiences, in the Brazilian market.

To explore practical implementation challenges specific to the Brazilian context, a semi-structured video interview was conducted with a professional experienced in implementing DT across organizations of different sizes and sectors. The interview followed research ethics: the participant received an informed-consent form detailing the study's objectives and use of information for academic purposes, and anonymity was assured. Topics included cultural barriers, organizational resistance, critical success factors, and implementation cases. These qualitative insights complemented the review and informed both questionnaire design and the analysis of survey results.

Finally, we developed a questionnaire for an exploratory survey to confirm and/or expand aspects related to constraints, advantages, and acceptance/rejection of DT in Brazilian companies from the perspective of practitioners. The instrument, created in Microsoft Forms and disseminated through professional networks, underwent three rounds of pilot validation. The final version organized respondents into three trajectories by level of knowledge and experience: (1) know and use DT; (2) know but do not use DT; and (3) do not know DT.

The survey covered eight dimensions: respondent profile; knowledge and use (diffusion, adoption, continuity); areas, benefits, and challenges; training and courses (capacity building and resistance governance); DT tools (practices, most-used tools, and perceived effectiveness); effectiveness and customer relationships; learning and perspectives (learning sources and future outlook); and organizations that do not adopt DT (barriers and methodological alternatives) (Table 1).

Table 1. Summary of the Questionnaire Structure

| <b>Block</b>                             | <b>Objective</b>                                 | <b>Survey questions</b>                                                                                                                                                                                                                                                               |
|------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Characterization                         | Describe respondents' profile                    | 1) Age range; 2) State; 3) Company; 4) Work sector; 5) Does the company use DT?                                                                                                                                                                                                       |
| DT knowledge and use                     | Measure diffusion, adoption, and continuity      | 6) How many times have you used DT?; 7) Since when has the company adopted it?; 8) Does the company continue using it?                                                                                                                                                                |
| Areas, benefits, and challenges          | Identify where DT occurs and how it is perceived | 9) Application areas; 10) Observed benefits; 11) Main challenges                                                                                                                                                                                                                      |
| Training and courses                     | Map capability building and governance           | 12) How does the organization handle resistance?; 13) Has it offered training?; 14) Courses you know; 15) Courses already offered                                                                                                                                                     |
| DT tools                                 | Measure concrete practices                       | 16) Most-used tools; 17) Perceived effectiveness of the tools                                                                                                                                                                                                                         |
| Effectiveness and customer relationships | Capture perceived effects                        | 18) Impact on the relationship with customers/users                                                                                                                                                                                                                                   |
| Learning and outlook                     | Assess learning sources and DT's future          | 19) Learning source; 20) DT's future role; 21) Expansion to other areas?; 22) What would you change?; 23) Beneficial characteristics; 24) Use of DT in Brazil                                                                                                                         |
| Organizations that do not adopt DT       | Understand barriers and alternatives             | 25) Are you familiar with DT?; 26) Have you considered applying it?; 27) Hindering factors; 28) Other methodologies?; 29) Openness to innovation?; 30) Investment in innovation; 31) Development challenges; 32) Benefits of DT; 33) Enabling/facilitating actions; 34) Courses known |

Source: author's own work (2025).

The target population comprised professionals working in Brazilian companies of any size or sector to broadly map DT diffusion in the national business context. Data were collected from March to May 2025, with Microsoft Forms hosting the online questionnaire. Initial dissemination via LinkedIn yielded limited responses, so distribution expanded to university and professional groups. We obtained 61 valid responses, adequate for the exploratory scope and for consistent descriptive analysis. Fisher's exact test was employed to assess the independence between categorical variables at a 5% significance level, particularly examining relationships between sector affiliation, DT knowledge, and implementation patterns.

#### 4. Results and Discussion

The mapping of providers of DT courses and training in Brazil shows a variety of actors (Table 2): traditional educational institutions (Escola Virtual GOV, ESPM, Fundação Dom Cabral), Brazilian Micro and Small Business Support Service - SEBRAE, consultancies, and online education platforms. Courses are offered online, face-to-face, and in blended formats. Course loads range from 4 to 37 hours, with some programs requiring 4–6 hours/week. Prices vary from free to paid. Target audiences include public officials, leaders and educators, HR, consultants, product/service managers, executives, and entrepreneurs.

Table 2. Mapping of Design Thinking courses and training programs

| Institution                 | Course                                                 | Target audience                                                                 | Price        | Duration   | Modality             |
|-----------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------|--------------|------------|----------------------|
| Escola Virtual GOV          | Design Thinking Course                                 | Public officials                                                                | Free         | 10 hours   | Online               |
| Fundação Dom Cabral         | Design Thinking and Project-Based Learning             | Leaders and educators; entrepreneurs and consultants                            | R\$ 416,00   | 4 hours    | Online               |
| Kellogg Executive Education | Design Thinking: A Toolkit for Breakthrough Innovation | Product/service managers, designers, consultants, executives, and entrepreneurs | US\$ 2,600   | 4–6 h/week | Online               |
| SEBRAE                      | Design Thinking: Improve Your Results on Social Media  | Individual microentrepreneurs (MEI), micro businesses, artisans                 | Free         | 9 hours    | Online               |
| ESPM                        | Creativity and Design Thinking                         | Analysts and managers; entrepreneurs                                            | Not provided | 18 hours   | Online and In-person |
| CRIAP – Institute           | Course in Design Thinking                              | Professionals in project management, marketing, and HR                          | € 225.00     | 37 hours   | Online and In-person |
| FM2S                        | Design Thinking                                        | Managers and coordinators; entrepreneurs in retail, industry, and services      | Free         | 12 hours   | Online               |

Source: author's own work (2025).

The semi-structured interview provided practical perspectives on challenges in the Brazilian context. With experience in organizational transformation projects across companies of different sizes and sectors, the specialist offered observations that complemented and contextualized the quantitative findings. The specialist reported often avoiding the term "Design Thinking" in early corporate conversations, opting for expressions such as "agile methodologies" or "user-centered innovation processes." In their experience, the English label can trigger resistance, being associated with imported fads or superficial practices.

This suggests part of the rejection stems from how the approach is framed and communicated, not from its principles. The interviewee emphasized that terminology resistance reflects deeper cultural issues, when presented in English, many Brazilian professionals perceive the methodology as another passing management trend rather than a substantive approach to innovation. Furthermore, the specialist highlighted that successful implementations often required complete immersion in the methodology, with cases showing that companies achieving positive outcomes were those where leadership committed to continuous training and gradual cultural transformation. One notable example shared was a successful implementation at a major beverage company, where sustained leadership support and ongoing

capacity building enabled a progressive shift in innovation culture, demonstrating that overcoming linguistic and cultural barriers requires long-term organizational commitment beyond merely adopting tools and techniques.

The survey reached 61 respondents, split into three trajectories: (1) know and use DT—14 (23.0%); (2) know but do not use DT—13 (21.3%); (3) do not know DT—34 (55.7%). The largest group comprises professionals from companies unaware of the approach, concentrated in traditional areas such as Operations (23.5%), Finance (17.6%), and Human Resources (14.7%), suggesting an early diffusion stage in the sample.

Among all respondents, 27 (44.3%) reported knowing the methodology and 14 reported using it; 10 companies maintain ongoing use. Usage is recent for most: 57.1% used DT only 1–2 times, 28.6% 3–5 times, and 14.3% more than five times—indicating DT remains relatively new in the Brazilian business context.

Within the 14 respondents that use DT (Trajectory 1), sectoral diversity is greater than among those that only know it, ten sectors represented, with emphasis on Commercial, Finance, Logistics, and Strategic Planning. Regarding tools, brainstorming stands out (78.6%), present in 11 of the 14 companies. More complex tools show lower adoption: stakeholder mapping (42.9%), rapid prototyping (35.7%), and user-journey mapping (35.7%). This predominance suggests partial application, focused on idea generation rather than systematic validation with end users.

As for barriers to adoption, Figure 1 illustrates the distribution of perceived challenges among the 14 companies currently using DT. The primary barrier identified was difficulty integrating DT with existing processes (57.1%), consistent with Elsbach & Stigliani's (2018) observations on how command-and-control structures constrain collaboration and creativity. Resistance to change and lack of familiarity each appeared in 28.6% of responses, while lack of time was reported by 21.4%. Notably, 14.3% reported no challenges.

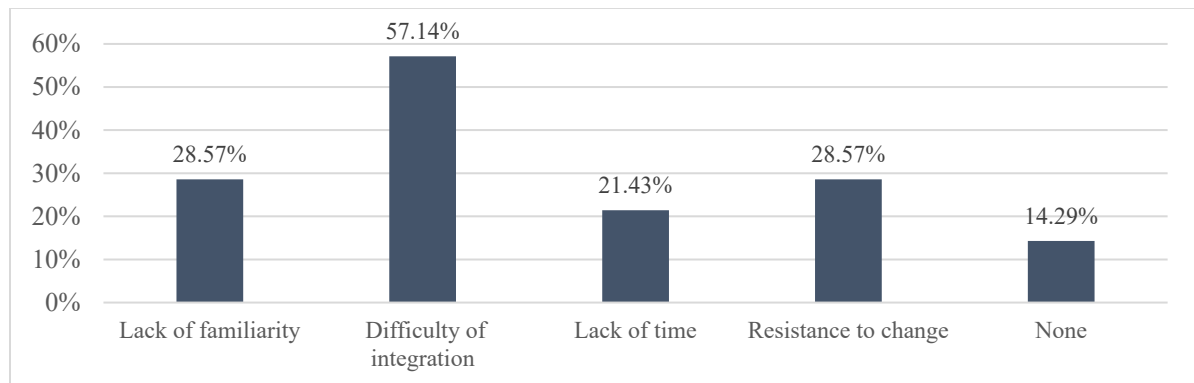


Figure 1. Distribution of perceived challenges in Design Thinking implementation (n=14)  
Source: author's own work (2025).

Comparatively, companies that know but do not use DT (n=13) report different obstacles: lack of in-depth knowledge (84.6%) emerges as the primary barrier, followed by rigid processes (53.8%) and cultural incompatibility (46.2%). These contrasting barrier profiles suggest different intervention strategies are needed for companies at different adoption stages—while active users struggle with integration into existing workflows, non-adopters face more fundamental knowledge and structural barriers.

Perceived benefits are shown in Figure 2. Better understanding of customer needs and improved customer interaction both achieved 71.4%, representing the most consistent benefits observed. Enhanced problem-solving capability was reported by 57.1% of respondents, while 50.0% perceived greater innovation capacity. Operationally, 42.9% see improvements in user experience. Only 3 (21.4%) report increased internal collaboration, despite the high use of brainstorming, suggesting that isolated tools do not alter organizational dynamics.

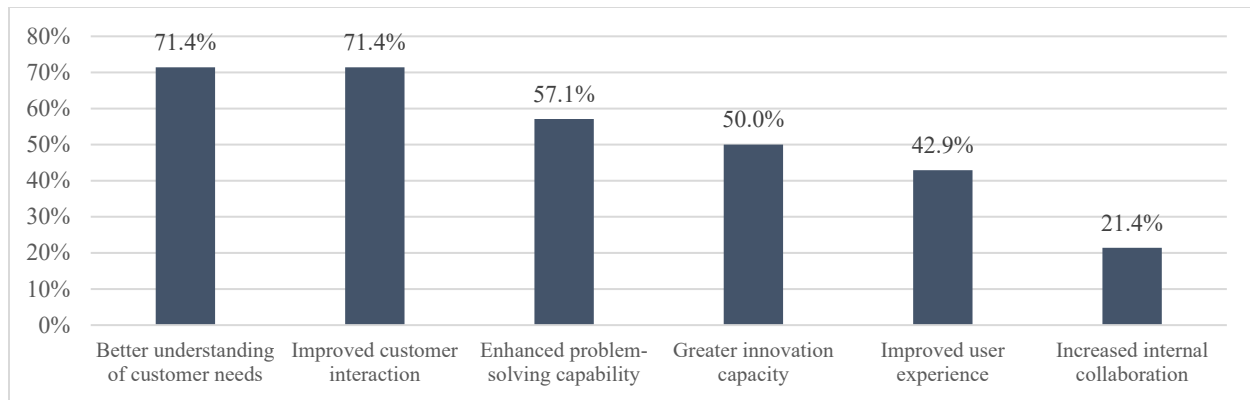


Figure 2. Distribution of perceived benefits from Design Thinking implementation (n=14)  
Source: author's own work (2025).

To examine the relationship between training provision and other variables of interest, Fisher's exact nonparametric test was employed. The independence hypothesis between pairs of variables was rejected when the test's descriptive level (p-value) was below the adopted significance level of 5%.

Table 3 presents the results of the independence tests performed. At the 5% significance level, all tests failed to reject the hypothesis of independence between the variable "The company provided Design Thinking training" and the other variables, except for the test regarding the variable "Challenge – Lack of familiarity." Proportionally, those who did not receive training were more likely to report a lack of familiarity with the Design Thinking approach. Although the sample size is very small, which greatly reduces the test's power to detect a false hypothesis, it was expected that training would lead to reflections on the benefits and challenges to be faced, resulting in greater awareness. Training was also expected to encourage more combined use of all tools.

Table 3. Descriptive level and conclusion of independence tests between pairs of random variables

| Variable 1                    | Variable 2                                | P-value | Conclusion                 |
|-------------------------------|-------------------------------------------|---------|----------------------------|
| The company provided training | Benefits - Greater innovation             | 1,000   | Are independent            |
|                               | Benefits - Better user experience         | 0,580   | Are independent            |
|                               | Benefits - Greater team collaboration     | 0,176   | Are independent            |
|                               | Benefits - Improvement in problem solving | 0,580   | Are independent            |
|                               | Challenge - Lack of familiarity           | 0,041   | <b>Are not independent</b> |
|                               | Challenge - Difficulty of integration     | 1,000   | Are independent            |
|                               | Challenge - Lack of time                  | 0,505   | Are independent            |
|                               | Challenge - Resistance to change          | 0,251   | Are independent            |
|                               | Challenge - None                          | 0,505   | Are independent            |
|                               | Tool - Brainstorming                      | 0,505   | Are independent            |
|                               | Tool - Stakeholder mapping                | 1,000   | Are independent            |
|                               | Tool - Rapid prototyping                  | 0,221   | Are independent            |
|                               | Tool - User journey                       | 1,000   | Are independent            |
|                               | Tool - None                               | 1,000   | Are independent            |

Source: author's own work (2025).

## 5. Conclusion

Although the concentration of responses in São Paulo limits national representativeness, the study yields relevant insights. The modest response count may reflect limited interest or awareness of DT in Brazil. Combined with the high share of participants unfamiliar with the methodology, the results suggest that, even in an environment that could be open to innovation, DT still faces hurdles to consolidation as an organizational capability.

The main barriers identified were integration with existing processes (57.1%) and lack of in-depth knowledge (84.6% among those who know but do not use), echoing Elsbach & Stigliani (2018). The most cited benefits were better understanding of customer needs (71.4%) and improved customer interaction (71.4%), while only 21.4% reported greater internal collaboration, reinforcing that using isolated tools does not necessarily transform collaboration.

This study contributes an exploratory diagnosis of DT diffusion in Brazilian firms, identifying adoption patterns, barriers, and perceived benefits. Limitations include non-probabilistic convenience sampling, a sample size of 61, and geographical concentration in São Paulo. Future research should track implementation over time to analyze success and failure factors, employ probabilistic samples with broader geographic coverage, and conduct in-depth case studies in organizations with successful implementations to identify practices and cultural adaptations specific to the Brazilian context.

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## Biographies

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**Cymrot, R.** holds a Bachelor's degree in Statistics from the University of São Paulo (1981) and a Master's degree in Statistics from the University of São Paulo (1985). Currently acts as a part-time professor at Mackenzie Presbyterian University. Focusing primarily on analyses involving nonparametric statistics, experimental design, and regression analysis. Conducting multidisciplinary projects applying statistical analysis in areas such as market research, health, education, production engineering, sustainability, and urban studies.