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TECHNOLOGICAL ARTICLE

What competencies should a dispute board member pursue to thrive?

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ABSTRACT

This article delves into the competencies that influence the activities of dispute board members in infrastructure construction in Brazil. The study involved interviews with 31 experts, including 15 engineers experts in the sector, leading to the identification of top six competencies through content and thematic analysis. This groundbreaking research offers valuable insights for dispute board members, as well as for public and private decision-makers, academics, and other industry professionals. The findings have practical implications for corporate disputes, concession operations, research and development, intellectual property, and production sharing, as they can be used to improve best practices and create value in various business contexts. Ultimately, this work contributes theoretically by offering original insights and practically by providing a foundation for future research.

KEYWORDS: Dispute Board. Infrastructure Construction. Brazil. Competencies.

Quais competências um membro do conselho de disputas deve buscar para ser bem-sucedido?

RESUMO

Este artigo investiga as competências que influenciam as atividades dos membros do Dispute Board na construção de infraestrutura no Brasil. O estudo envolveu entrevistas com 31 especialistas, incluindo 15 engenheiros especialistas do setor, levando à identificação das Seis Principais Competências por meio de análise de conteúdo e temática. Esta pesquisa inovadora oferece informações valiosas para os membros do Dispute Board, bem como para tomadores de decisão públicos e privados, acadêmicos e outros profissionais do setor. As descobertas

também têm implicações práticas para disputas corporativas, operações de concessão, pesquisa e desenvolvimento, propriedade intelectual e compartilhamento de produção, pois podem ser usadas para melhorar as melhores práticas e criar valor em vários contextos de negócios. Em última análise, este trabalho contribui teoricamente, oferecendo insights originais e praticamente fornecendo uma base para pesquisas futuras.

PALAVRAS-CHAVE: Dispute Board. Construção de infraestrutura. Brasil. Competências.

¿Qué competencias debe perseguir un miembro de un foro de disputas para prosperar?

RESUMEN

Este artículo profundiza en las competencias que influyen en las actividades de los miembros del Dispute Board en la construcción de infraestructura en Brasil. El estudio implicó entrevistas a 31 expertos, incluidos 15 ingenieros especialistas en el sector, lo que llevó a la identificación de las seis principales competencias a través del análisis de contenido y temático. Esta investigación pionera ofrece información valiosa para los miembros del Dispute Board, así como para los tomadores de decisiones públicos y privados, académicos y otros profesionales de la industria. Los hallazgos también tienen implicaciones prácticas para las disputas corporativas, las operaciones de concesión, la investigación y el desarrollo, la propiedad intelectual y la distribución de la producción, ya que pueden utilizarse para perfeccionar las mejores prácticas y crear valor en diversos contextos comerciales. En última instancia, este trabajo contribuye teóricamente al ofrecer ideas originales y en la práctica al proporcionar una base para futuras investigaciones.

PALABRAS CLAVE: Dispute Board. Construcción de infraestructuras. Brasil. Competencias.

INTRODUCTION

Disputes and conflicts commonly arise during industrial or infrastructure construction project implementation (Quintão, 2023; El-Sayegh *et al.*, 2020). These issues have been recognized as widespread problems and can disrupt project success, resulting in delays, higher expenses, failure to meet objectives, performance, or even project failure (Viswanathan *et al.*, 2020; Agdas; Ellis, 2013). Lawsuits are a standard method of resolving disputes in the courtroom. However, several strategies, such as Alternative Dispute Resolution (ADR) methods, are available to prevent conflicts. These methods include negotiation, mediation, conciliation, adjudication, and arbitration. Research by El-Sayegh *et al.* (2020), Dias (2020), Harmon (2003), Edwards (1986), Muigua (2018), Reif (1990), and Dias (2016) has shown that these ADR methods are faster and more cost-effective than going through official courts to resolve construction disputes (Agdas; Ellis, 2013).

In addition, despite the existing initiatives, the Dispute Board (DB), a relatively new and intriguing method of ADR, still needs to be discovered. First developed by the International Federation of Consulting Engineers (FIDIC) in 1913, followed by the Chartered Institute of Arbitrators (CIArb) in 1915, the International Chamber of Commerce (ICC) in 1919, and the Dispute Resolution Board Foundation (DRBF) in 1996, the DB holds significant potential.

Finally, studies have also found that dispute prevention and resolution are effective (Chapman, 2009), parts cooperation improves (Delmore, 2006), and ADR methods have a positive

impact on project cost and schedule (Lumbwe, 2019). Different types of dispute resolution (DB) and their applications vary across construction project areas and locations (Agdas; Ellis, 2013; Figueroa, 2017). However, more research is needed to analyze competencies for DB members to improve their activity in infrastructure and construction projects globally, specifically in Brazil. Therefore, this research aims to provide insights into organizations' selection and development of DB members and recommend competencies as part of that process. The assumption is that conflicts and disagreements have perpetually arisen and are inherent to humans. Another assumption is that particular talents are necessary for resolving disagreements, a shortcoming this article addresses in the upcoming sections.

THE EVOLUTION OF THE ADEQUATE DISPUTE RESOLUTION (ADR) METHODS IN BRAZIL

Appropriate Dispute Resolution methods (ADR) in Brazil have been introduced recently, with the Arbitration Law of 1996 and the Mediation Law of 1998 revised in 2015 with the new civil code. The Dispute Board's (DB) presence in Brazil is also recent, and it was initiated through international banks financing projects in Brazil (Silva Neto, 2019; Domingues, 2022). Negotiating with an unofficial arbitrator to settle disputes has existed throughout history, with the first Brazilian constitution incorporating ADR in 1824. The Portuguese medieval legal system recognized arbitration as an alternative form of conflict resolution, with the Alfonsine ordinances, Manueline ordinances, and Philippine ordinances being the leading legal diploma of commercial law in Brazil until the enactment of the commercial code of 1850 (Ferreira; Oliveira, 2019). The Arbitration Law of 1996 gave new impetus to arbitration in Brazil, including the emergence of leading arbitration chambers. The Reform of the Arbitration Law in 2015 expanded the scope of arbitration application, allowing its use by direct and indirect public administration (Ferreira; Oliveira, 2019; Silva Neto, 2019), being improved by the new Bidding Law (Brasil, 2021), which provide legal certainty for the use of ADR (Santos, 2024; Resende, 2023).

COMPETENCES AND MODELLING

Since the late 20th century, accreditation councils, professional councils, and educational entities worldwide have emphasized integrating different competencies and skills for professional training (ABET, 2022; Iturbe *et al*., 2009; Seely, 2005). This fact has led to developing methods to identify and assess these competencies before or during training, selecting a particular professional position, or determining their suitability during working life. The market has started to demand social relationship skills, and universities have improved their courses to teach specific skills needed to practice engineering. The United States, Italy, and China have all improved their engineering curriculums, identifying twelve competencies needed for new engineers. The soft skill concept emerged between 1968 and 1972 in the United States military, as soldiers needed knowledge that guaranteed interactions with people and situations (ABET, 2022). In the 1990s, significant innovation in human resource development led to different terms

for evaluating performance and competence. *Competence* is generally defined as a requirement for effective and superior performance in a job. At the same time, competencies recognize a professional's competence level due to their relevant attributes, such as attitudes, skills, and knowledge. A hierarchy of terms and characteristics has been suggested, with competence as an area of work, competency as the behavior that supports a scope of work, and competencies as the attributes underpinning a behavior (Caruana, 1999; Seely, 2005; Matteson *et al.*, 2019; Whitmore; Fry, 1974).

Competency modeling emerged in the mid-19th century as a precursor to competency studies, with the Critical Incident Technique (ICT) being established. The study focused on significant behavioral events distinguishing successful and exemplary performers (Rothwell; Lindholm, 1999). In 1973, the reliability of intelligence tests was questioned, leading to the American Management Association (AMA) and McBer and Company launching the first large-scale competency program (Rothwell; Lindholm, 1999; McClelland, 1973). The study involved over 1800 managers over five years, defining *job competence* as generic knowledge, traits, self-image, social role, or skill related to superior job performance. Five key competencies were identified as essential for a manager's success: specialist knowledge, entrepreneurial maturity, intellectual maturity, interpersonal maturity, and work maturity (Rothwell; Lindholm, 1999). The competency mentioned above program began to attract attention to unify organizational human performance improvement interventions. The competency model was introduced as a focal point for planning, organizing, integrating, and improving all aspects of human resource management systems (McLagan, 1980). In this way, the competency model was developed and defined as a decision tool that describes the main capabilities needed to perform a job, supporting recruitment and selection, assessment, development planning, coaching, mentoring, succession planning, and career paths (Rothwell; Lindholm, 1999; McLagan, 1980).

However, the last decades of technological advances have forced companies and institutions to reinvent themselves, continuously training and improving the skills of their professionals (Atolagbe; Yan, 2022), especially in this post-pandemic period (COVID-19) (Michel *et al.*, 2022). Thus, acquiring and improving social skills has been imperative for the success of companies in this new digital reality, becoming critical due to the acceleration caused by the pandemic (Atolagbe; Yan, 2022).

With technological evolution and the new digital era, the search for continuous qualification has been a way to ensure that employees' skills do not become obsolete. With requalification, a complete and more qualified workforce has been created, which has increased team effectiveness. However, even with the strong development of soft skills, some hard skills have also stood out during the pandemic, such as specialized and learned technical talents, including information technology certifications, fluency in reading and writing, and presentation and project management skills (Atolagbe; Yan, 2022).

METHODOLOGY

The research is based on studies by Saunders *et al.* (2009) and Rugg and Petre (2006), using a qualitative research technique to explore professional experiences and perspectives. The study employs interpretivism, an inductive approach, through in-depth semi-structured interviews with DB experts to examine the competencies expected of members of a dispute board. A cross-sectional study was conducted to examine the time horizon and impact on evaluating the activity of dispute board members in the construction scenario in Brazil. The findings can provide valuable information for decision-makers on selecting the appropriate dispute board method to avoid delays and disputes on project execution, as well as supporting the selection and development of members for the dispute board.

SAMPLING STRATEGY

The study utilized purposive sampling, criteria sampling, and snowball sampling to select interviewees for the research with background in engineering. Purposive sampling was chosen due to its importance in data quality, and criterion sampling was used to select interviewees from various Brazilian backgrounds, including those with experience in the construction market, engineers, professionals with double degree in engineering and law, DRBF members, construction specialists, PMO leaders, and ADR professionals, with an average of 31 years of professional experience, with a sample ranging with professionals from 11 to 45 years of experience. The snowball sampling strategy was chosen for the study as it allowed participants to help locate and recommend additional interviewees, ensuring privacy in dispute board cases. Interviewees may nominate others for training or board member participation.

FINDINGS AND ANALYSIS

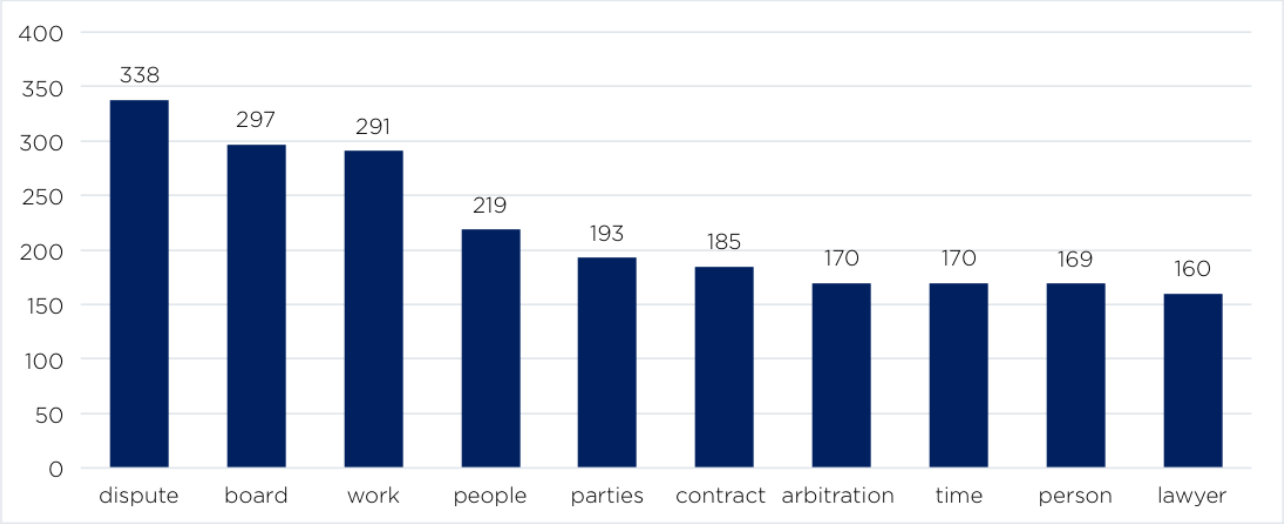
The study utilized Myers and Newman's (2007) semi-structured interview approach to gather information from experienced professionals in the Construction sector. The approach included pre-established questions and the flexibility to include spontaneous questions (Gioia *et al.*, 2013). The interviews were conducted with 50 Brazilian experts, with the semi-structured questionnaire presented as open-ended questions. The interviews were scheduled via email, WhatsApp, or online chat via Zoom® platform. The interviews were conducted in person or via Zoom®, with recording done via computer, cell phone, and Zoom® platform. Thirty interviews were conducted with 31 participants, of which 15 participants had a background in engineering, from November 2022 to October 2023, with an average duration of 35 minutes. The semi-structured interview method allowed for the exploration of new concepts and the discovery of new perspectives. The study's reliability and validity were ensured through open-ended questions. Finally, guarantees were given that the collected information would not be publicly available. In the scenario mentioned earlier, the interview would be deemed illegitimate, hence requiring the organization of a new interview. Under the recommendations proposed by Myers and Newman (2007), it was used distinct ways to alleviate cognitive biases. The phenomenon

of elite bias, a type of discrimination, was examined through interviews with individuals from different backgrounds, including those with double degrees and with between 11 and 45 years of professional experience.

The 30 interviews totaled 84,454 words. All data were collected in Brazilian Portuguese and translated into English for further analysis. Their data was analyzed after eliminating irrelevant statements, phrases, field notes, questions, and Observer Comments (OC) from Brazilian Portuguese respondents. After being transcribed, the raw data was translated into English. The interviews were done in quiet environments with no background noise to minimize distractions. The NVivo® 12-student version program produced charts, such as a frequency distribution in Figure 11 and a word cloud in Figure 1, to help visualize the data.

Figure 1 displays "dispute," "board," "work," "people," parties," "contract," "arbitration," "time," "person," and "lawyer" as the most cited words found in the interviews. "dispute" was mentioned 338 times, while "board" was cited 297 times, separately. However, the text analysis revealed that "dispute" and "board" appeared together 246 times, which meets our expectations once the main subject comprises the two words together.

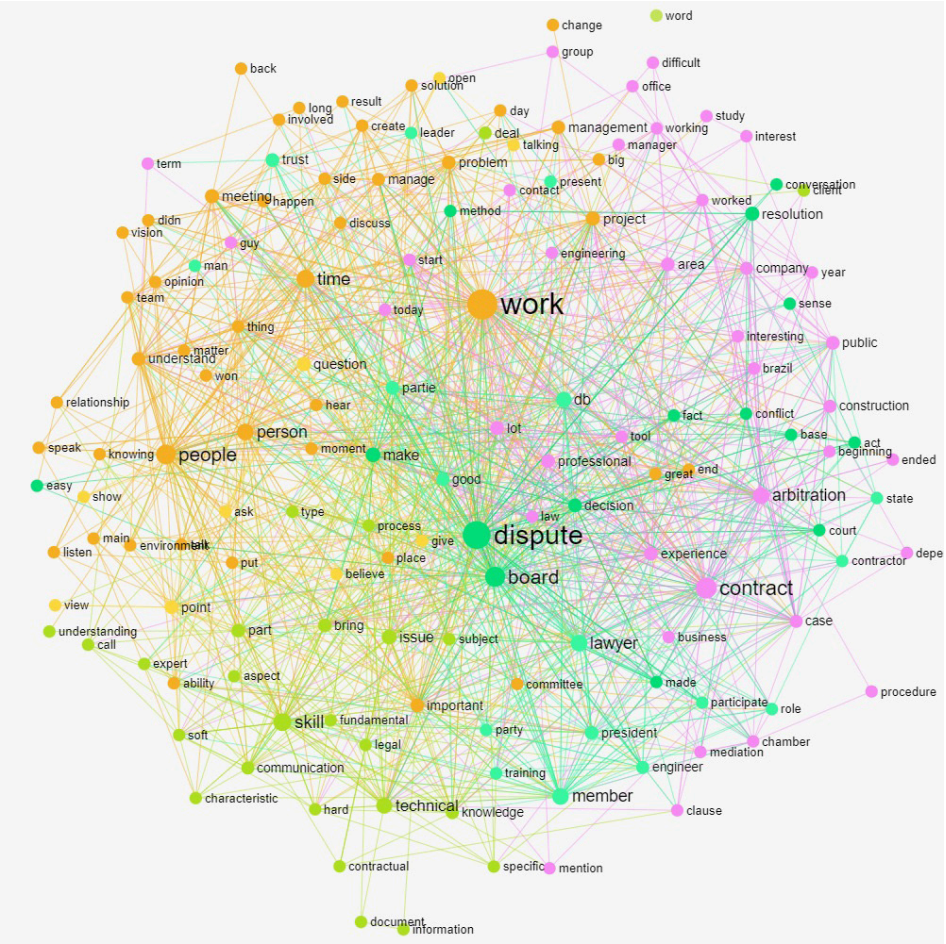
FIGURE 1 **In-depth interviews frequency distribution**



SOURCE: Quintão (2023).

Figure 2 outlines the text word analysis findings for the raw data from the interview session, presenting the interrelationships between the most frequent words (more prominent bullet points) and the least frequent words (more minor bullet points), as follows:

FIGURE 2 Interviews text network



SOURCE: Quintão (2023).

The methodology provides valuable perspectives that need further exploration in the following qualitative interviews. The subsequent section analyzes the interviews, resulting in valuable insights. The coding technique posed a considerable obstacle, requiring independent coders to triangulate coding to reduce the potential for misinterpretations.

The open, axial, and selected codes were systematically categorized into separate groups and subcategories following a thorough three-phase, iterative coding process. This methodology revealed the emerging themes via comprehensive textual analysis. First, the open codes were grouped, the axial principles emerged (subcategories), and finally, the categories (selective codes). The study involved merging redundant categories or subcategories in back-and-forth iterations, following Strauss and Corbin (1990). Data was triangulated by a researcher to ensure validity, following Denzin (1978) and Miles *et al.* (2014). As a result, nine themes emerged (thereafter competencies) including: (a) conflict containment; (b) dispute board soft skills; (c) dispute board hard skills; (d) DB process autonomy and regulation; (e) stakeholder management; (f) problems anticipation; (g) emotional intelligence; (h) trust, and (i) adaptation to digital technology (Quintão, 2023).

TABLE 1 **Interviews cluster analysis**

Interviewee	Background	Conflict Containment	Dispute Board Soft Skills	Dispute Board Hard Skills	DB Process Autonomy and Regulation	Stakeholder management	Problems Anticipation	Emotional Intelligence	Trust	Adaptation to Digital Techonology
I#3	Engineer	●●●	●	●	●●●	●	●	●●●	●	●
I#4	Engineer	●●●	●●●	●●●	-	●●●	●●●	●●●	●●●	●●●
I#8	Engineer	●●●	●	●●●	●●●	●	●●●		●●●	●●●
I#9	Engineer	●●●	●●●	●●●	●●●	●●●	●	●●●	●	●●●
I#12	Engineer	●●●	●	●	●●●	●●●	●●●	●	●	●●●
I#14	Engineer	●●●	●●●	●●●	●●●	●●●	-	●●●	●●●	●●●
I#21	Engineer	●●●	●	●	●●●	●●●	-	●	●	●●●
I#22	Engineer	●●●	●●●	●	●●●	●●●	-	●	●	●●●
I#23	Engineer	●●●	●	●	●●●	●●●	●●●	●	●	●●●
I#28	Engineer	●●●	●	●	●●●	●●●	-	●	●	●●●
I#17	Lawyer & Engineer	●●●	●●●	●●●	●●●	●	●●●	●	●●●	-
I#19	Lawyer & Engineer	●●●	●●●	●●●	●●●	●	-	●	●●●	-
I#20	Lawyer & Engineer	●●●	●	●	●●●	●	●●●	●	●	-
I#24	Lawyer & Engineer	●●●	●	●	●●●	●	●●●	●	●	-

NOTE: (Đ) = Relevant; (ĐĐĐ) = Extremely Relevant; (-) =non-Relevant.

SOURCE: Quintão (2023).

The data in Table 1 of interview cluster analysis, were again analyzed after all the interactions, for all interviewers with degree in engineering, including professionals with double degrees (law and engineering), the top six main competencies were:

Competency one: conflict containment is crucial for conflict resolution and problem-solving in organizations, as strongly perceived by the 15 interviewees. It involves using facilitative negotiation techniques to seek consensual solutions and contain conflict escalation. Delmore (2006) supports this competency, stating that DB is a unique and non-adversarial project management technique. Other studies present negotiation as a voluntary process, and professional organizations like PMI, IPMA, and APM have developed guides and frameworks to identify project manager and claims management competencies, very important for engineering professionals.

Competency two: dispute board soft skills are crucial for engineers, and other professionals, as they involve the ability to argue, communicate, integrate people, and impose oneself. These skills are often overlooked in the courtroom but are essential for achieving organizational goals. The combination of hard and soft skills is essential, as supported by the Stakeholder Theory. *Soft skills* are the ability to deal with diverse situations, including socio-emotional skills, personality characteristics, and behavior. They include cognitive and non-academic skills and are considered critical in today's job market. Various approaches have been developed to identify and model the competencies of a project manager, such as the ability to continue learning, upskilling, and planning and achieving goals.

Competency three: dispute board hard skills are crucial for professionals responsible for interpreting contracts, following procedures, and standards. Nonviolent communication is considered the first soft skill, followed by active listening. Combining hard and soft skills is essential, as the Stakeholder Theory supports. Accreditation councils, professional councils, and educational entities worldwide have emphasized integrating different competencies and skills for professional training. The market has started to demand social relationship skills, and universities have improved courses to teach specific skills needed for practice. The education system worldwide has also improved the engineering curriculum. Hard Skills are specific abilities to perform a particular job or competencies, which can be learned through courses, studies, assessments, tests, diplomas, or portfolios.

Competency four: *DB process autonomy and regulation*, emphasizing the need for new products, agenda setting, and regulation review. It also highlights the limited autonomy of the contractor's side. The Stakeholder Theory supports the Dispute Board's role in balancing autonomy and responsibility in dispute resolution. This competency is supported by DRBF and other institutions that establish requirements, rules, and procedures for holding a Dispute Board (Gould, 2006).

Competency five: *stakeholder management* is crucial for middle-level professionals. It emphasizes mapping and understanding strategies to work effectively with diverse stakeholders. It is essential to pass on strategies to the board for determination. The stakeholder theory supports this, as individuals or groups can affect organizational goals and establish new relationships. The American Bar Association supports this competency, citing improved cooperation between parties in large projects and the development of dispute boards.

Competency six: adaptation to digital technology is crucial for engineers, as dispute board members must master digital technology due to the shift from traditional engineering subjects to digital engineering. This competency can lead to difficulties discussing issues, as everything is stored in digital envelopes. This competency is also supported by Engelbrecht *et al*. (2017).

IMPLICATIONS AND DISCUSSION

This research investigates the importance of competencies that affect the activity of Dispute Board (DB) members and their implications for other fields, from the point of view of engineering professionals with real experience in the area. The study aims to broaden the scope of DB members' activity and provide implications for other fields, making the research cross disciplinary. The role of DB members can contribute to understanding new concerns and challenges faced by DBs by allowing interest groups to influence the activity. The research has implications in other fields and subfields of Human Resources research, such as recruiting DB members and establishing standards for hiring and training workers. It also has applications in Project Management, as these competencies may help establish PM standards for creating internal Dispute Boards associated with or independent of a Project Management Office (PMO), which could help prevent conflicts in virtually all management areas. The incentive for creating Dispute Boards in all types of construction contracts, infrastructure, and other further applications is an offshoot of this research, as the competencies can be used to define selection and development rules, contributing to the rules and regulations of the DB. The research also has implications for the future of DB activity in Brazil and other countries, as the competencies may serve as legislation boundaries destined to regulate the activity in the Country by setting new standards uncovered in this investigation. One of the most critical implications of the research is the performance improvement of DB members. The findings help DB members meet scope, budget, and schedule objectives and conclude the project, improving performance and business value. The Six Top Competencies present implications include conflict containment, soft skills, hard skills, process autonomy and regulation, stakeholder management, adaptation to digital technology and adaptability to digital evidence. These competencies can help DB members better understand and address the challenges faced by DBs, promoting impartiality, confidentiality, transparency, and value creation. This study has implications in other fields and subfields of research, such as: (a) governmental negotiations (Fernandes; Dias, 2024); (b) nonmarket negotiations (Navarro; Dias, 2024); (c) business negotiations (Santos; Dias, 2024a, 2024b; Dias, 2023a); (d) construction negotiation (Dias, 2023b); (e) business mediation (Dias *et al*., 2023a); (f) virtual negotiations (Dias *et al*., 2023b); retail business negotiations (Valente; Dias, 2023)

FUTURE RESEARCH

It is recommended that future researchers conduct large-scale statistical studies to evaluate individuals and provide detailed descriptions of employment openings. Additional research is advised to enhance the Brazilian discussion on the responsibilities and obligations of dispute board members in various organizations. DB's success in cost reduction, delay, and

dispute management is often compared in several nations, spanning continents such as the Americas, Europe, and Asia. For instance, a statistical analysis was conducted to create indices that compare the performance of development banks (DB) performance in the Brazilian market, specifically focusing on private and public projects. The study compared vital performance indicators (KPIs) such as cost savings, schedule control, the ratio of informal assistance to formal assistance, the implementation of recommendations and decisions, and the number of decisions questioned or resolved through arbitration or public court. Finally, the other three Competencies presented in Table 1, which were not detailed here, were more relevant for Lawyers, and their implications will be discussed in future works.

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DATA AVAILABILITY

The entire dataset supporting the results of this study was made available in Research Gate and can be accessed in https://www.researchgate.net/publication/378365630_FACTORS_INFLUENCING_THE_DISPUTE_BOARD_MEMBERS'_ACTIVITY_IN_THE_BRAZILIAN_INFRASTRUCTURE_CONSTRUCTION_BUSINESS

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