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Elements and Practices of Managing Digital Transformation Projects to Support Business Agility – a Systematic Review of the Literature

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Abstract

Objective of the study: to present the elements and practices of Digital Transformation project management capable of supporting the Business Agility process in organizations.

Methodology: Systematic Literature Review of 112 articles in the academic databases Scopus and Web of Science.

Originality/relevance: transitioning from traditional to digital means can take organizations to a new level of efficiency, with the incorporation of Business Agility, supported by the management of Digital Transformation projects.

Main results: the results identified five categories that contribute to the relationship between Digital Transformation projects and Business Agility*:* Operational Impact, Digital Technologies, Organizational Agility, Project Management, and Business Processes.

Theoretical/methodological contributions: the results obtained from the systematic literature review confronted with empirical research will allow to advance the discussions on Digital Transformation and Business Agility.

Contributions to society: organizations mainly seek to position employees as protagonists of the change arising from Digital Transformation and Business Agility. Another practical contribution is the relevance of leadership in managing Digital Transformation projects, which must be close and participative with the project teams.

Keywords: business agility, digital transformation projects, project management, digital technologies

Elementos e Práticas de Gerenciamento de Projetos de Transformação Digital para Suportar o Business Agility – Uma Revisão Sistemática da Literatura

Resumo

Objetivo do estudo: apresentar os elementos e práticas de gerenciamento de projetos de Transformação Digital capazes de suportar o processo de *Business Agility* nas organizações.

Metodologia: Revisão Sistemática da Literatura de 112 artigos nas bases de dados acadêmicas *Scopus* e *Web of Science*.

Originalidade/ relevância: a transição dos meios tradicionais para os digitais poderá levar as organizações a um novo nível de eficiência, com a incorporação do *Business Agility*, suportados pelo gerenciamento de projetos de Transformação Digital.

Principais resultados: os resultados identificaram cinco categorias que contribuem na relação entre os projetos de Transformação Digital e o *Business Agility*: Impacto Operacional, Tecnologias Digitais, Agilidade Organizacional, Gerenciamento de Projetos e Processos de Negócios.

Contribuições teórico/metodológicas: os resultados obtidos a partir da revisão sistemática de literatura confrontados com a pesquisa empírica permitirão avançar as discussões sobre o fenômeno de Transformação Digital e *Business Agility*.

Contribuições para a sociedade: as organizações buscam principalmente posicionar os funcionários como protagonistas da mudança oriunda da Transformação Digital e *Business Agility*. Outra contribuição prática, é a relevância da liderança no gerenciamento dos projetos de Transformação Digital, que deve estar próxima e participativa junto às equipes de projetos.

Palavras-chave: business agility, projetos de transformação digital, gerenciamento de projetos, tecnologias digitais

Elementos y Prácticas de Gestión de Proyectos de Transformación Digital para Apoyar la Agilidad Empresarial: Una Revisión Sistemática de la Literatura

Resumen

Objetivo del estudio: presentar los elementos y prácticas de gestión de proyectos de Transformación Digital capaces de apoyar el proceso de *Agilidad de Negocio* en las organizaciones.

Metodología: Revisión sistemática de la literatura de 112 artículos en las bases de datos académicas *Scopus* y *Web of Science*.

Originalidad/relevancia: **la** transición de los medios tradicionales a los digitales puede llevar a las organizaciones a un nuevo nivel de eficiencia, con la incorporación *de la Agilidad de Negocio*, apoyada en la gestión de proyectos de Transformación Digital.

Resultados principales: **los** resultados identificaron cinco categorías que contribuyen a la relación entre los proyectos de Transformación Digital y la *Agilidad de Negocio:* Impacto Operacional, Tecnologías Digitales, Agilidad Organizacional, Gestión de Proyectos y Procesos de Negocio.

Aportes teóricos/metodológicos: **los** resultados obtenidos de la revisión sistemática de la literatura confrontada con la investigación empírica permitirán avanzar en las discusiones sobre el fenómeno de la Transformación Digital y la *Agilidad Empresarial.*

Contribuciones a la sociedad: las organizaciones buscan principalmente posicionar a los empleados como protagonistas del cambio derivado de la Transformación Digital y *la Agilidad Empresarial*. Otra aportación práctica es la relevancia del liderazgo en la gestión de proyectos de Transformación Digital, que debe ser cercano y participativo con los equipos de proyecto.

Palabras clave: agilidad empresarial, proyectos de transformación digital, gestión de proyectos, tecnologías digitales

Introduction

In recent years, there has been a perceptual change in the way in which organizations have started to develop their business processes, increasingly adopting digital aspects in their daily lives, seeking to respond, in a more agile and flexible way, to market changes, ensuring its sustainability (Centobelli, Cerchione & Ertz, 2020). As a way of increasing organizational agility, organizations in the financial or manufacturing segments, for example, have become increasingly dependent on the incorporation of solutions based on innovative digital technologies, thus boosting the Digital Transformation (TD) process (Sambamurthy, Bharadwaj & Grover, 2003).

During this process, organizations encountered challenges when treating digital innovation as a simple digitization of their operational processes and/or offering their products and services in a digital medium without previously revisiting their strategic management models (Wiesboeck, 2018). Ho *et al*. (2022) mention in their studies that the lack of a unified approach to developing a digitalization strategy can be considered an important factor in the failure of DT implementations.

There is no consensus in the academic literature on a conceptual definition of TD, although organizations use the term as a synonym for agility (Albertin & Albertin, 2021). However, according to Fitzgerald *et al*. (2014), it can be defined as the use of new digital technologies to improve business performance, such as improving the customer experience, streamlining processes, and creating business opportunities. Warner and Wäger (2019) point out that some organizational leaders do not consistently use the term TD when describing the activities involved in the strategic decision-making process. The authors also highlight the limitations of using TD as support for strategic change and project execution.

To be effective, TD requires fundamental changes to business processes, operations, and organizational functions, including the adoption of agile project management methodologies (Kozarkiewicz, 2020). Thus, the Agile Manifesto (Fowler & Highsmith, 2001), initially designed to cover the management of software development projects, began to be extended to other business areas, identifying gains in incorporating the reported values and practices (Moi & Highsmith, 2001). Cabiddu, 2021).

In the context of strategic change in an organization, Business Agility (BA) can be defined as the ability to dynamically allocate organizational resources to meet the changing demands of a market environment, where dynamism affects an organization's performance and can have adverse effects (Reitz, Jentsch & Beimborn, 2018). For Chen *et al*. (2014), BA is considered an organizational capability that helps an organization to better obtain and deploy resources to respond to market conditions. In this context, BA becomes a strategic tool to support TD within the organization, increasing the agility of strategic or managerial initiatives (Santo, Cardoso & Marques, 2022).

To be considered successful, TD depends on (i) the application of new technologies and (ii) understanding the importance of BA in its strategy and organizational processes, and how TD and BA interrelate (Washizaki *et al*. al., 2020). The need to innovate business models in search of sustainable digital models will lead organizations to seek strategies focused on internal and external collaboration networks (Camarinha-Matos, Fornasiero & Ferrada, 2019). However, such changes in digital business processes require organizations to adopt new approaches to planning and developing products and services to increase their maturity to adapt to an uncertain and dynamic market environment (Münch, Trieflinger & Lang, 2019).

Although there is research in the academic literature that addresses TD projects and the impacts caused to organizations by executing these projects, there are still opportunities to point out which factors would result from the execution of these projects and how they would support BA. In this sense, the objective of this research was to identify the elements and practices of Digital Transformation project management that support the Business Agility process in organizations. To achieve the objective, a Systematic Literature Review (RSL) was carried out, with a research corpus made up of 112 articles from the academic databases Scopus and Web of Science.

As a result, the objective of this research is to collaborate with TD project managers in identifying and understanding factors that may positively or negatively interfere with the results expected from the implementation of a TD process in organizations. As an academic contribution, the approach to the subject will bring new insights to advance discussions about the phenomenon of TD and BA and their relationship in organizations.

This article is divided into six sections. After this introduction, section 2 provides a brief theoretical framework for TD and BA projects. Section 3 presents the research design. The results are demonstrated in section 4, followed by the discussion in section 5. Finally, section 6 presents the final considerations.

Theoretical Reference

Below is a brief review of the literature on the topics of Digital Transformation and Business Agility.

Digital Transformation Projects

According to Auriga (2021), TD began to be discussed in the 1990s, being treated as the computerization of processes and implementation of digital activities in organizations. For

Downes and Nunes (2013), TD is more broadly addressed, including the introduction of new digital technologies to improve organizational performance and competitiveness and significant changes in the composition of business models, operational models, and customer experience, in addition to aspects social and cultural aspects of the organization.

The changes arising from TD pose several challenges for organizations, both in terms of strategic organizational issues, how TD is understood, and how to reference and use available digital skills and resources (Bilgeri, Wortmann & Fleisch 2017). In this sense, Rogers (2016) indicates that the breadth of DT must be treated strategically, paying attention to its relationship with other domains such as customers, competition, information, innovation, and value creation. Fitzgerald *et al*. (2014) reinforce the complex structural change promoted by TD, becoming a critical issue for organizations.

TD projects in general produce impacts on three major dimensions of organizations: organizational, business, and technology. Regarding the organizational aspect, when working on the implementation of a TD project, it is necessary to facilitate organizational change through governance combined with cultural change within the organization itself (Yoshikawa *et al*., 2020). However, according to Pereira *et al*. (2019), the process of adopting DT can generate resistance within the organization's own culture, factors that leaders must keep in mind.

One of the greatest challenges to be faced by organizations, during a TD project, is to meet the lack of individuals trained in technical, behavioral, and critical thinking issues (Brunet-Thornton, Cramer & Jirsák, 2019). Attracting and retaining talent that has the necessary skills and abilities to face the constant changes resulting from the TD process becomes a determining factor to be considered by organizations (Perides, de Vasconcellos & Vasconcellos, 2020). Organizations must address, in addition to technical aspects, behavioral particularities (such as

attitudes, values, and motivations) with employees, and develop new essential skills to enable the development of their activities in different contexts (Abraham *et al*., 2001).

When relating TD projects with public sector organizations, it can be identified in the literature that these projects, when executed with a vision of the state and not of a momentary government, can generate benefits for the sector (Sulistya *et al*., 2019). The authors report that the development of new solutions and services based on new digital technologies generates in return greater agility in service provision, transparency of information, and increased efficiency and effectiveness. The outsourcing of some critical performance activities or the adoption of public-private partnerships can also be considered as an action to increase the efficiency of TD projects in the public sector (Venkateswaran & Jyotishi, 2017).

TD projects are considered a complex activity and their implementation in an organization is considered strategic. However, these projects can result in significant changes to activities, processes, functions, business models, and processes, as well as organizational structures that are in line with the BA process.

Business Agility

In contemporary business environments, agility is a fundamental tool for dealing with innovation and competitive performance. The environmental changes that organizations face reflect how business models are designed and often require adjustments. The speed of decision-making can influence an organization's behavior in allocating and directing resources to respond appropriately to the market environment in which it operates.

According to Sambamurthy, Bharadwaj and Grover (2003), organizations can perceive and respond to these changes on three fronts: (i) customer agility; (ii) partnership agility; and (iii) operational agility. Also, according to the authors, customer agility is characterized by responding to customer needs, and identifying emerging opportunities more quickly; partnership

agility would be related to the way organizations maintain relationships with partners, aiming to increase the speed of entry to the market; Finally, operational agility would be characterized by the renewal of processes aimed at increasing the organization's response speed and efficiency.

Organizations constantly face the challenge of remaining sustainable. These challenges arise, sometimes in unexpected ways, so that leaders adopt practices (often through continuous improvement) to better respond to adversity and remain agile and competitive (da Silva, Penha & da Silva, 2022). Leadership must be demonstrated in a transparent way in communication to inspire confidence in the team and positively impact the achievement of the objectives set.

Organizations that seek to reinvent their business processes, with the incorporation of digital solutions and the adoption of agile practices, can offer their products and services with better quality, with the return of providing a better experience to customers and a reduction in operational costs (Kettunen & Laanti, 2017). An agile approach not only helps organizations adapt their strategies to market changes but also increases their adaptability and flexibility to meet the product needs of different markets (Moi & Cabiddu, 2021). In this sense, organizations must seek to incorporate an agile culture to influence the promotion of flexibility, adaptability, agility, and business innovation (Neto *et al.*, 2022).

Given this need for agile responses, speed and flexibility are key elements for decision-making. TD project teams can use tools that assess the maturity of the product roadmap, whose response can identify the probability of product success, avoiding wasted effort in planning and implementation (Münch, Trieflinger & Lang, 2019). The specialization of products and services and technological specialization are identified as differentiating factors for organizations to stand out in an increasingly aggressive market (Jerónimo, Pereira & Sousa, 2019). Corroborating this, organizations have a future vision of the need to adapt to TD. The use of innovative and

disruptive digital technologies can provide the BA with the necessary support so that these elements can be acquired.

Methodology

The research presented here adopted an SLR as a method, to understand the convergence of two relevant themes. The first theme is related to agile BA practices. The second theme is related to the management of activities aimed at TD. RSL differs from traditional narrative reviews by adopting a systematic scientific process, which is replicable and transparent. In this sense, its use is also justified, as it minimizes bias in the construction of a theoretical corpus, as well as the possibility of building an audit trail of the decisions and procedures applied (Cook, Mulrow & Haynes, 1997).

The procedures for carrying out this RSL followed six phases by the prescriptions of Pollock and Berge (2018): (i) clarify research goals and objectives; (ii) search for relevant research; (iii) collect data; (iv) evaluate the quality of the studies; (v) synthesize the evidence; (vi) interpret the findings. The objective of the phases and activities presented is to guarantee the rigor and robustness that are aimed at in this type of research.

The first step - clarifying research goals and objectives - was motivated by the question that guides this research. For this purpose, the academic databases Web of Science and Scopus were used as research sources, as they are considered two of the main databases for accessing published research in social sciences.

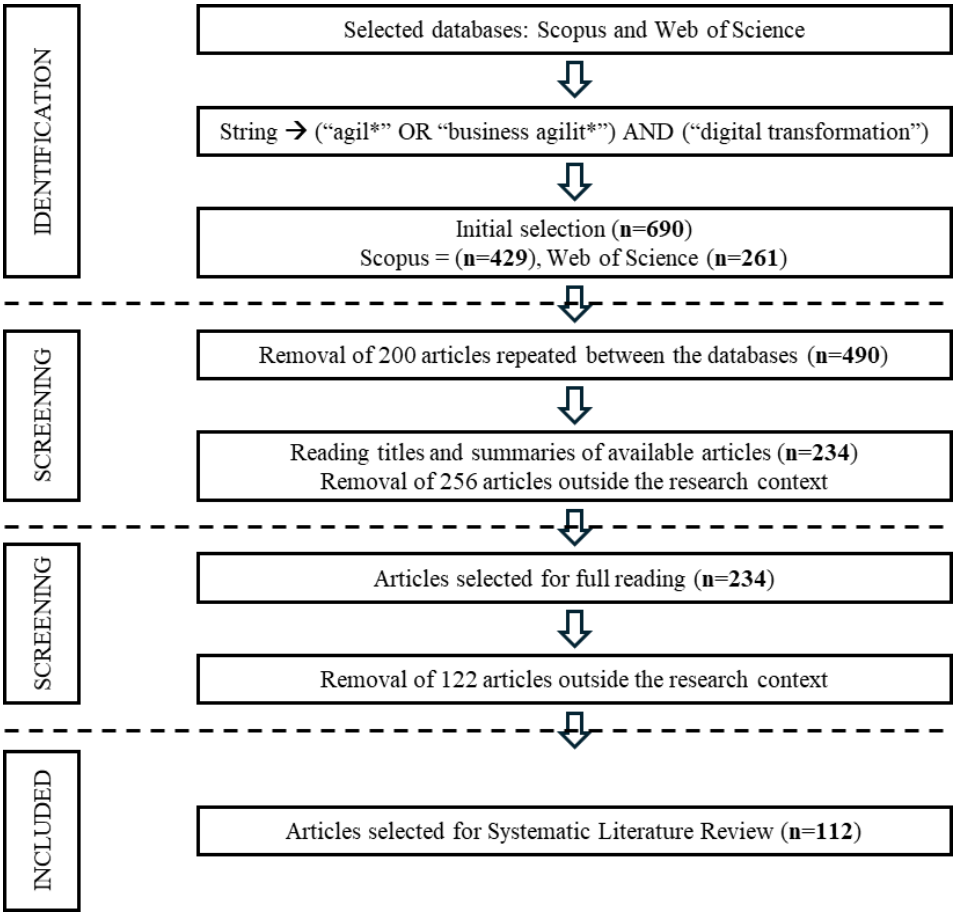
The string used to carry out the searches was ("agil*" OR "business agilit*") AND ("digital transformation")). The research was carried out on April 4, 2022. The use of the Boolean operators “and” and “or”, in addition to the use of the “*” symbol, allows for greater scope and control in the construction of the research base. The operators are applied taking into account the intersection of the two research areas studied. The use of the asterisk incorporates all

variations of the word in the position after it is found. It is noteworthy that no temporal filter was applied so that it was possible to map the entire production on the themes studied.

Thus, after the first stage, in which the objectives were established, the search string mentioned above was applied. The results found in the first round were analyzed and ordered, presented in Figure 1. It is worth highlighting that this phase also followed the prescriptions of Pollock and Berge (2018), which establish a four-step process for constructing the analysis corpus.

Figure 1

RSL Steps



Source: Prepared by the authors based on Pollock and Berge (2008)

After collecting the researched articles, the next step to be performed is Screening. This procedure aims to allow researchers to evaluate articles that may appear in both search bases, that is, that are duplicates, allowing them to be subsequently removed. After this removal, a filter is applied based on a closer reading of the titles and summaries of the articles.

At this stage, the application available at https://rayyan.ai was used, in which, after creating a new review, the bases were loaded. At this point, there has already been the possibility of removing duplicity, initially by classifying the name of the article. There was also a new, more detailed review to check that there were no duplicate publications. In this way, we started with a universe of 690 initial articles, and, after filtering, 200 duplicate articles were removed, resulting in a new base with 490 articles.

The third stage involves applying the eligibility criteria. At this stage, the database is validated according to the inclusion and exclusion criteria. In high-quality research, the establishment of inclusion and exclusion criteria is a standard and necessary practice in the creation of research protocols.

According to Hulley *et al*. (2007), inclusion criteria are defined as the main characteristics of the target population that researchers use to answer research questions. Exclusion criteria, on the other hand, meet the inclusion criteria but have the potential for participation with additional properties that may affect the success of the research or increase the risk of adverse consequences for these participants, defined as an aspect of the person. Table 1 explains the inclusion and exclusion criteria.

Table 1

Inclusion and Exclusion Criteria

Inclusion criteria	Reason for Inclusion
Articles with the conceptualization of the studied constructs (Business Agility, Digital Transformation)	Allows the researcher to understand the constructs used in the works
Articles that address the relationships between the studied constructs	Allows understanding of interdependencies and relationships between constructs
Published articles	Provides more rigorous discussion and considered theoretical contributions.
Exclusion Criteria	**Reason for Exclusion**
Articles focused on Software Architecture, Software Engineering, Economics, or other areas not related to the determined constructs	Articles whose content does not focus on questions that provide insights to achieve your research objectives.
Articles without relevant theoretical foundations or with little relationship with the constructs.	One of the purposes of the study is to obtain future research perspectives, through existing theoretical knowledge in a structure, for which theoretical assumptions are prerequisites.

Source: prepared by the authors based on Pollock and Berge (2008)

As a last step, after creating the database, the research results were exported, and the data was prepared and analyzed with the help of Microsoft's Excel spreadsheet software. The software made it possible to combine quantitative information from frequency analysis with qualitative information from the classification of article content. This research phase also allowed a relevant descriptive analysis of the research carried out.

Therefore, the final stage of the analysis was the complete reading of the analysis corpus, which consists of 112 articles. At this stage of the research, the articles were read more carefully, categorizing the content of the spreadsheet in the Excel software, allowing the results to be grouped and the categories compared.

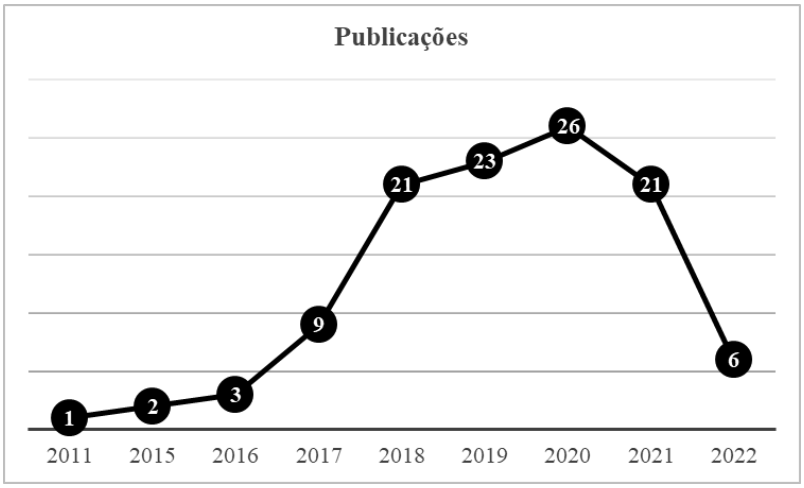
The activities applied in this phase are aligned with the prescriptions of Pollock and Berge (2018) in the phases (v) synthesize the evidence and (vi) interpret the findings. Although some quantitative treatments were applied, in this research the qualitative analysis of the articles was prioritized, to constitute a matrix that could represent the findings of this study.

Results of the Systematic Literature Review

The research corpus was composed of articles compiled from the Web of Science and Scopus databases. To guarantee the integrity of the search, after applying the search filters, the results from the two databases were unified, and duplicate documents were removed. In the end, the research corpus resulted in 112 documents. The evolution of academic production on the topic until the first half of April 2022 is demonstrated in Figure 2.

Figure 2

Evolution of literary production on the topic



Source: Prepared by the authors (2023), based on research data – a survey carried out in the ISI database – Web of Science and Scopus

The results in Figure 2 demonstrate that, until 2015, there were few publications relating to the topic, with an average of 1 to 2 publications per year (in fact, there is no record of publications between 2012 and 2014). In 2016, there was a small increase in production, with the

addition of 3 publications. Since 2017, there has been an increase in published articles, reaching 9 publications in the year. The year 2018 saw a new increase in the number of articles, with 21 articles published. 2019 shows a slight increase in the number of research, rising to 23 publications. The highest concentration of publications (26) occurred in 2020. In 2021 there was a small drop in the number of publications, with 21 publications.

After reading the articles that make up the research corpus, the findings were categorized to seek insights into answers to the research question "**What are the elements and practices of TD project management to support BA?**". Table 2 below presents the synthesis of the 5 categories resulting from the research corpus analysis process:

Table 2

Main Categories

Category	Quantity	Focus	Authors
Organizational Agility	40	Organizational and Cultural Structure of Organizations;	Abdallah, Shehab e Al-Ashaab (2021); Ackermann, Schell e Kopp (2021); Andriole (2018); Bauer e Vocke (2018); Bhatnagar e Grosse (2019); Brunet-Thornton, Cramer e Jirsák (2019); Burchardt e Maisch (2019); Chetty *et al*. (2018); Cooney, Korsten e Marshall (2021); Durão *et al*. (2019); Ferreira, Moreira e Seruca (2017); Fischer e Senft (2016); Fuchs e Hess (2018); Genzorova, Corejova e Stalmasekova (2019); Gong, Janssen e Weerakkody (2019); González-Varona *et al*. (2020); Imran *et al*. (2021); Kohli e Johnson (2011); Lamacchia, Chowdhury e Sharif (2020); Lindner e Leyh (2018); Liu, Yang e Liu (2021); Maisiri e Van Dyk (2021); McCarthy, Sammon e Alhassan (2021); Mikalsen *et al*. (2018); Moreira, Ferreira e Cardoso (2018); Pereira *et al*. (2019); Sandhu (2018); Santo, Cardoso e Marques (2022); Schuh e Frank (2020); Schwer e Hitz (2018); Shirokova *et al*. (2020); Steininger *et al*. (2022); Strønen, Rønning e Breunig (2019); Tanniru, Khuntia e Weiner (2018); Vilaplana e Stein (2020); Warner e Wäger (2019); Weritz, Braojos e Matute (2020); Wiesboeck (2018); Winasis, Wildan e Sutawidjaya (2020); Yoshikawa *et al*. (2020);
Business Processes	30	Redesign of business processes; Innovation of products and services;	Achatz (2017); Agrawal, Narain e Ullah (2019); Al-Ali e Phaal (2019); Ashrafian *et al.* (2019); Bondar *et al*. (2017); Bodiova e Martinez (2017); Boratyńska (2019); Centobelli, Cerchione & Ertz (2020); Chu *et al*. (2019); Clohessy, Acton e Morgan (2017); Depaoli, Za e Scornavacca (2020); Gerster, Dremel e Kelker (2019); Han e Trimi (2022); Ho *et al*. (2022); Jerónimo, Pereira e Sousa (2019); Jesemann *et al.* (2021); Karimi e Walter (2021); Kettunen e Laanti (2017); Li *et al*. (2021); Manjunath e Hegadi (2018);; Nandico (2016); Priyono, Moin e Putri (2020); Rozo, Moreira e van Sinderen (2020); Troise *et al*. (2022); Tronvoll *et al*. (2020); Van Zeebroeck, Kretschmer e Bughin (2021); Wang (2020); Wissal, Karim e Laila (2020); Yucel (2018); Zimmermann *et al*. (2015b);
Digital Technologies	13	Cloud Computing; Artificial intelligence; Big data; Technological Training	Andriole (2018); Arabi *et al.* (2021); Durão *et al.* (2019); Ebrahimi, Baboli e Rother (2019); Genest e Gamache (2020); Golovatchev e Schepurek (2015); Hofmann, Samp & Urbach (2020); Josyula, Suresh e Raman (2021); Kaltenbach *et al.* (2018); Moreira, Ferreira & Seruca (2018); Sjödin *et al.* (2021); Wang (2020); Zimmermann *et al*. (2016);
Project management	28	Agile Methodology; Risk management; IT Governance	Al-Ali e Phaal (2019); Bouayad, Benabbou e Berrado (2018); Crowley *et al*. (2017); Didi-Quvane, Smuts e Matthee (2019); do Amaral Gonçalves *et al*. (2021); Emer, Unterhofer e Rauch (2021); Gobble (2018); Hassani *et al.* (2018); Indriasari, Supangkat e Kosala (2020); Jonathan e Gebremeskel (2020); Kozarkiewicz (2020); Majdalawieh (2019); Mikalsen *et al*. (2018); Mircea (2021); Moi e Cabiddu (2021); Münch, Trieflinger e Lang (2019); Nerurkar e Das (2017); Ojo (2019); Pacheco, Sanchez e Guido (2020); Proper, Bork e Poels (2021); Reiter e Miklosik (2020); Sulistya *et al*. (2019); Vejseli *et al*. (2018); Venkateswaran e Jyotishi (2017); Washizaki *et al.* (2020); Wong e Van Gils (2022); Ylinen (2021); Yoshikawa *et al*. (2020)
Operational Impact	9	Modernization of the Technological Park; Cost Reduction	Bekbossynova e Bekniyazov (2020); Clohessy, Acton e Morgan (2017); Kalinowski *et al*. (2020); Kiran Mallidi, Sharma e Singh (2021); Sjödin *et al*. (2021); Telegescu (2018); Wilson (2020); Wolf, Semm e Erfurth (2018); Yoo e Kim (2019);
Total	**120**		

Source: prepared by the authors based on research data

The categories presented in Table 2 reflect the analysis and interpretation obtained by the researcher, demonstrating the main constructs identified: Organizational Agility, containing 40 works; Business Processes, with 30 jobs; Digital Technologies, with 13 works; Project Management, with 28 jobs; and finally Operational Impact, with 9 works. In this context, works that fell into more than one category were identified. Due to the small volume of work in this situation, the option was chosen not to create an additional category just to separate them. In the following subsections, the interpretations of the analyses for each category will be presented.

Organizational Agility

In an increasingly volatile and competitive environment, organizations must find ways to remain competitive in the market and respond more quickly to the increasingly sophisticated needs of customers in terms of the products they buy and services they consume (Santo, Cardoso & Marques, 2022). In this context, organizational agility refers to how a company sets itself up to face challenges arising from competitiveness, thus obtaining the ability to respond quickly and agilely to threats and opportunities that arise.

The evolution of organizational maturity, strategic alignment, culture, and behavior, in line with the adoption of new technologies, can provide opportunities for organizational agility to be successfully implemented in organizations (Brunet-Thornton, Cramer & Jirsák, 2019). In this sense, the development of organizational agility (to prosper in the face of the emergence of new competitors, the development of new technologies, or sudden changes in general market conditions) must be treated as a systemic change, since TD is not about only about the introduction of new technologies (Durão *et al*., 2019; Pereira *et al*., 2019).

From a TD perspective, organizational maturity in an organization is the effort made to achieve a strategic plan that aims to move from a traditional management model to an agile model (Yoshikawa *et al*., 2020), thus resulting in a possible advantage capability strategic. In this

sense, the implementation of agile practices in complex organizational environments can promote greater autonomy for project teams in carrying out their activities (Mikalsen *et al*., 2018).

However, depending on how the agile methodology is implemented, the process of changing from traditional to agile project management models can bring negative impacts to your organization, such as uncertainty within the team or even resistance to the proposed change (Fuchs & Hess, 2018). As reported by Abdallah, Shehab and Al-Ashaab (2021), this change is a continuous process that needs management to plan and execute incrementally, aiming to achieve the strategic objectives of the TD process.

The process of transforming traditional practices into agile project management practices requires the realignment of organizational leadership to adapt to the agile context, aiming to ensure compliance with new management models, promote a new agile culture, and manage potential conflicts (Burchardt & Maisch, 2019). The introduction of an organizational structure characterized by the distribution of responsibilities among team members improves agility in decision-making (Ackermann, Schell & Kopp, 2021), allowing teams to self-organize with distributed leadership, resulting in transparency, responsibility, and agility (Schwer & Hitz, 2018; Lindner & Leyh, 2018).

It can be concluded that organizations that seek an agile and flexible way of responding to external forces and market changes need to change their organizational model. The transition from a traditional to an agile management model will promote the organization of more collaborative and connected teams. Agile leadership committed to change will bring greater transparency in decision-making, in addition to empowering teams with the proposal to be self-organized. The development and retention of digital talent, engaged with organizational strategy,

will allow the creation and offering of new products and services that meet the deadline, cost, and quality required by its customers. However, all this change will prove ineffective if there is no restructuring of the organizations' business processes.

Business Processes

TD is not simply about adopting new technologies to meet business needs in an organization. The TD process must go through the organizational structure, incorporating agility and flexibility into the organization's culture, leadership, and behavior. This agility and flexibility must be incorporated into the organization's business processes so that the remodeling in the way they are developed seeks an operational gain.

The integration of new digital technologies into business processes, to redesign the products and services offered, facilitates the development of digital businesses (also known as e-business) by organizations, thus providing new experiences for customers and partners (Gerster, Dremel & Kelker, 2019). According to Yucel (2018), e-business must be enabled around innovation, technology, and data, which will result in a better understanding of customer demands. In this context, the role of corporate architecture begins to be reevaluated (Wissal, Karim & Laila, 2020), becoming a fundamental actor in the conception of new business opportunities (Rozo, Moreira & van Sinderen, 2020) through the integration of digital technologies (Nandico, 2016).

The revolution imposed by TD on traditional business models, according to Achatz (2017), results in numerous benefits, including innovative products and services with greater added value, changes in the business world, and even changes in the way project management is carried out (from traditional to agile). However, Al-Ali and Phaal (2019) highlight that this change should allow the understanding and evaluation of digital trends and the drivers that direct innovation in organizations, which is driven by the proposal to prioritize the customer

experience. The customer experience and the usability of their digital platforms are now considered critical success factors in the digital journey of organizations (Kettunen & Laanti, 2017).

When it comes to new challenges, digital business directs organizations to seek innovation based on the alignment between business and IT (Li *et al*., 2021), in which the digitalization of their business processes, products, and services is no longer a competitive differentiator, but the search for specialization of products and services, as well as technological specialization (Jerónimo, Pereira & Sousa, 2019). TD plays a fundamental role in an organization's innovation process, in which IT resources have a positive impact on business process innovation and product and service innovation (Chu *et al*., 2019). However, the authors report that this success largely depends on the strategic vision of long-term investment in human and financial resources in IT.

Van Zeebroeck, Kretschmer and Bughin (2021) point out, in their studies, that the renewal of the digital-oriented business strategy is influenced by the adoption of new disruptive technologies, whose essence is to guarantee access to the Internet everywhere, becoming a differentiator for the organization. In this sense, Clohessy, Acton and Morgan (2017) highlight the development of new products and services in environments based on Cloud Computing type architecture, which have resources to allow organizations the possibility of experimenting with their business models without the need greater contribution of financial resources in the process.

Given the above, the reformulation of business processes for digital must be thought and built considering an integrated vision between organization and technology, where technology itself must be used as a means to generate business opportunities and delight customers, thus bringing added value to what is offered to customers.

Digital Technologies

The arrival of Industry 4.0 has revolutionized the way organizations relate to new technologies and, consequently, how they interact with their customers and partners. Actions that would previously take minutes or hours are now completed in a matter of seconds or even less. This relationship is due to the evolution of so-called “disruptive digital technologies”, in line with the increasing availability of faster network connections.

Within organizations, it is possible to observe a growing relevance in the implementation of certain categories of technology that are considered to enable TD, such as agile collaboration tools, the Internet of Things (IoT), and Big Data (Moreira, Ferreira & Seruca, 2018). Given this scenario, organizations are expected to encourage a process of technological training in their IT and business teams and strive to align the skills and competencies associated with TD (Andriole, 2018). On the other hand, Genest and Gamache (2020) reflect the existence of a gap in the knowledge of these technologies, leading organizations to incorporate the need for training or qualification of qualified professionals into their strategic planning.

The constant search for improvements in the performance and automation of processes and flows has led organizations to adopt technologies aimed at Robotic Process Automation (RPA) as a way of reducing costs and increasing operational efficiency (Hofmann, Samp & Urbach, 2020). However, according to Josyula, Suresh and Raman (2021), there is a need for better training of professionals involved in this transition, to understand how agile development practices can be planned, measured, and improved through the implementation of agile development programs. automation, analytics, and AI (Josyula, Suresh & Raman, 2021).

Due to the need to develop agility in their processes to respond to market changes, organizations must use AI capabilities as a competitive driver, and not just as a supporting

technology to drive business model innovation in digital services (Sjödin *et al*., 2021). The authors argue that the resources provided using AI can bring new digital business opportunities, bringing new value to the business. In this context, studies on the applicability of AI have become more widespread in other areas of activity, such as the pharmaceutical sector and construction, being categorized as a strategic decision tool (Arabi *et al*., 2021).

As previously presented, organizations have sought to incorporate digital technologies into their business processes in search of innovation in their business models, evolving towards e-business. Thus, TD involves the integration of digital technologies into the main operations of organizations, requiring a fundamental change in the way they manage their businesses and add value to their customers. However, some organizations tend to use financial resources in infrastructure and technology without proper integration with business processes, transforming them into digital businesses only. As a means of balancing this scenario, organizations must seek solutions that optimally use the resources made available by digital technologies, thus maintaining market competitiveness, and adding value to the products and services provided to their customers and suppliers.

Project Management

In an increasingly volatile and uncertain business environment, responsiveness to customer and supplier requirements is seen as a key factor in project success. In this sense, organizations began to adopt project management techniques based on agile methodologies instead of traditional (or predictive) methodologies. Unlike predictive practices, which are characterized by rigorous execution, agile practices allow products and services to be developed incrementally and iteratively by interdisciplinary collaborative teams (Hassani *et al*., 2018; Kozarkiewicz, 2020).

From a project management perspective, TD projects require governance measures that facilitate organizational change along with cultural changes within the organization itself (Mikalsen *et al*., 2018). On the one hand, organizations are inserted in a dynamic business environment, requiring the adoption of strategic planning that requires organizational agility (Yoshikawa *et al*., 2020). Leadership communication must be clear and transparent, thus promoting a collaborative, stimulating work environment based on trust among members (Moi & Cabiddu, 2021).

Although Agile Project Management (GAP) initially originated for software development management, some of its practices became widespread in other areas of private sector activities and even in public organizations. About public organizations, Venkateswaran and Jyotishi (2017), Jonathan and Gebremeskel (2020) and Ojo (2019) identify that they have constantly sought to incorporate excellent practices from the private sector, aimed at improving performance (Ylinen, 2021), as a way to achieve its objectives of implementing digital governance. Nerurkar and Das (2017) and Sulistya *et al*. (2019) observe that the adoption of agile practices by public organizations reflects better stakeholder management and agility in the delivery of products and services, in addition to increased satisfaction in their main stakeholder.

The use of agile practices in TD projects promotes the development of self-organized and multifunctional teams, which have the characteristics of greater diversity in their composition and greater autonomy in carrying out their activities, resulting in greater flexibility and a higher rate of success. better quality project deliveries (Gobble, 2018). However, this greater autonomy does not mean a lack of "management" exercising command and control to carry out the planned activities, but rather a leadership that acts in a way that transmits confidence to the teams and

positively influences them, acting mainly as a facilitator for achieving established goals (da Silva, Penha & da Silva, 2022).

Concerning management processes, the choice of an appropriate IT Governance structure (GTI) must consider, among other factors, the organizational environment and its implementation capacity, in which the success of its implementation will increase according to the maturity organizational structure (Bouayad, Benabbou & Berrado, 2018). In the same sense, Indriasari, Supangkat and Kosala (2020) and Pacheco, Sanchez and Guido (2020) argue that the implementation of a decentralized organizational structure provides the organization with an advantage for the adoption of agile practices, such as multifunctional teams and DevOps, in which teams now have greater decision-making autonomy.

In a volatile and turbulent environment like software development, organizations must be prepared to take advantage of the opportunities presented by digital business processes and adapt their project management practices becoming more agile and flexible (Wynn & Olayinka, 2021). The implementation of a hybrid project management model, combining best practice tools and processes from the predictive and agile model, may be a better option (Amaral Gonçalves *et al*., 2021).

A hybrid model replaces the traditional project management model and allows the application of agile practices in business areas considered more dynamic, aiming for greater risk control and supervision. Regardless of the model used, however, risk management must be able to continually evolve the project management process to meet the needs of the organization.

Operational Impact

TD is impacting every sector of the global economy, requiring organizations to transform the way they relate to their customers and partners. Being able to respond with agility and flexibility to new requirements will require not only a paradigm shift in the way these

organizations configure their organizational structures but also a review, adaptation, or transformation of their business models and processes based on digital business processes, incorporating the best digital technology solutions available or committing ourselves to developing new solutions (Telegescu, 2018).

Despite the high initial investment costs of digital technology, the decision to move from a traditional business model to a digital business model should be based on the goals outlined in the strategic plan and should establish short- to long-term goals (Clohessy, Acton & Morgan, 2017; Yoo & Kim, 2019). In this sense, the authors point out that organizations must have the predictability of reducing costs and increasing ROI, in addition to delivering products and services with greater agility and quality to the end customer, which can be considered as an expected result of the investment.

Regarding the expectations of those involved in TD projects, as a way of imputing demands for agility and flexibility in meeting customer demands, organizations need to modernize their technology parks, the result of which can lead to a reduction in operational costs (Kiran Mallidi, Sharma & Singh, 2021). An organization's strategic planning must consider the possibility of internally training talent to work in the new digital environment, in addition to training employees with digital skills to facilitate knowledge sharing, thus reducing the need to hire specialized resources (Wolf, Semm & Erfurth, 2018). For Bekbossynova and Bekniyazov (2020), encouraging employees' self-development should be maintained as a perennial item in their strategic plan rather than a one-off action.

Organizations, regardless of the field of activity or sector (public or private), constantly seek to optimize their resources to maximize gains and reduce costs, to be effective and efficient, and to achieve planned organizational objectives (Telegescu, 2018). To achieve these goals, they

seek to develop TD projects that, aligned with strategic planning, resources can be better directed towards the modernization and innovation of their business processes, aligned with the incorporation of new technologies and the adoption of agile practices project management, thus making the organizational environment more agile and dynamic.

The Relationship of Digital Transformation Projects in Supporting Business Agility

From the literature review and analysis of the categories above, it was possible to identify some TD project management elements and practices to support the BA. Table 3 presents the elements and practices related to TD project management and how they support an organization's BA process.

Table 3

Agile Elements and Practices

Categories	Elements	Practices
Operational Impact	Financial Investment x New Technologies	Strategic Planning Alignment
	Security and Reliability	Increase Cybersecurity
	Cost Reduction	Increase Technological Capacity
Digital Technologies	Knowledge	Sharing technical knowledge
	Adopting data for decision-making	New business opportunities
Organizational Agility	Strategic and Competitive Advantage	Proximity to the team
	Breaking resistance to change	Development of technical and interpersonal skills
Project management	Cultural and communication change	Improved communication between leadership and teams
	Breaking resistance to change	Adoption of agile practices
Business Processes	Business process renewal	Prioritize the customer experience
	Integration of business and IT teams	Improve interaction with customers

Source: Prepared by the authors

When considering the Operational Impact, it is possible to identify a correlation between the acquisition of new digital technologies and the financial resources invested by the organization in TD projects, aiming to meet the alignment between the organization's strategic planning, the increase in technological training, and cybersecurity. The results arising from the implementation of TD projects can contribute to reducing costs inherent to the need to allocate resources with specialized knowledge, in addition to reducing risk exposure to the organization by maintaining customer reliability.

In the relationship between Operational Impact and Digital Technologies, it is possible to verify that this relationship can make resources available for the use or development of collaborative tools using Data Analytics and AI, in addition to promoting the sharing of knowledge among team members. The results to be measured during the TD project are related to validating whether the objectives established by the executing teams and those established in the strategic planning are aligned, the provision of structured data in real-time for making decisions considered critical to the business.

About Organizational Agility, it is possible to ascertain the possibility of the organization acquiring the ability to obtain a strategic and competitive advantage in the market concerning its competitors, in addition to the need to implement initiatives that enable the development of hard and soft skills of employees of organizations.

In relation to Project Management, it was possible to verify that the adoption of agile Project Management practices and the IT Governance discipline are now considered relevant actors in cultural and communication change by organizations, bringing possible results, based on the execution of TD projects, the development of multifunctional and self-organized teams

that use DevOps practices, in search of continuous delivery of innovation and value to the business.

About Business Processes, it was possible to point out the existence of a greater relationship with other categories. Its relationship with Project Management infers the need for an agile transformation in the way businesses are developed. In relation to Organizational Agility, the development of behavior among employees related to resistance to organizational and cultural change arising from the TD process is highlighted. Digital Technologies can expose the need for change in the organization's leadership, focused on the balance between people in leadership roles and the project team, establishing a relationship of trust and respect.

After analyzing the categories and their relationships with TD projects, it is possible to infer the possible benefits resulting for organizations during the process of changing their business processes to transform them into e-business. The search for excellence and efficiency by organizations may result, with the execution of TD projects, in achieving the main objective, which is “customer centricity”, contributing to the prioritization of the customer experience throughout the product or service journey.

Final Considerations

This article aimed to present, based on a Systematic Literature Review, covering the elements and practices of TD project management to support the BA. The results found allowed us to list some categories and, within them, extract some elements and practices of TD project management that support the BA.

At the end of this research, it can be concluded that the general objective was achieved. It is noteworthy that the general objective was to present the elements and practices of Digital Transformation project management to support Business Agility.

The results demonstrate the importance of TD in organizations that seek to reposition themselves in the market (in the face of market volatility) or renew the products and services offered to increasingly demanding customers, corroborating the assumptions presented by Santo, Cardoso and Marques (2022). This renewal implies cultural and organizational changes to develop organizational agility, as reported by Brunet-Thornton, Cramer and Jirsák (2019).

The transition from a traditional management model to an agile management model facilitates the organization of more collaborative and connected teams (Yoshikawa *et al*., 2020). In this sense, cultural change in organizations, towards an agile culture, could favor the development of agile leadership and commitment to greater transparency in decision-making, in addition to empowering teams with the proposal to be self-organized, reinforcing the results highlighted by Ackermann, Schell and Kopp (2021).

By combining the development of digital skills in employees with corporate strategies, as cited by Wolf, Semm and Erfurth (2018), it becomes possible to develop and provide new products and services that meet the expectations of a better delivery of experience to customers. The need for a renewal of business processes for e-business, integrated with the resources provided by new digital technologies, must be thought about and constructed considering an integrated vision between organization and technology, in line with the studies by Li *et al*. (2021). The limited view on the use of technology must be put aside, starting to see it to generate business opportunities and delight customers (Jerónimo, Pereira & Sousa, 2019), thus bringing added value to the business.

As a practical contribution, the research sought to demonstrate some of the elements and practices of TD project management to support the BA. These elements and practices suggest that organizations seek mainly to place the employee as the protagonist of the transformation,

driven by challenges. Another practical contribution is about the role of managers in leading TD projects, who must be close to their teams, not only exercising a commanding role but also acting and participating, encouraging them to constantly seek continuous improvement. As for theoretical contributions, the results obtained from the Systematic Literature Review compared with empirical research will make it possible to advance discussions on the phenomenon of TD and BA in organizations.

This research presents limitations found in other qualitative assessments, commonly found in systematic literature reviews. The research sought to stick to the context of TD project management and its relationship with BA. A limitation identified in the research was the low volume of publications related to the topic published by Brazilian researchers, which offers, on the other hand, opportunities for research agendas to be stimulated to delve deeper into the topic.

Suggestions for future studies, based on the results found in the RSL, are: (i) carrying out field research with professionals who work in the execution of TD projects, to obtain their perceptions about the categories and elements identified at RSL; (ii) develop a conceptual model, based on the results of the field research suggested in item (i); (iii) stimulate new research related to TD and BA themes, thus contributing to deepening the discussion about them and increasing the literary sources to be made available for new research.

AUTHORS'CONTRIBUTIONS

Contribution	Galvão Junior, G. S.	Penha, R.	Silva, L. F.	Vasconcelos, V. N. S. A	Gonçalves, M. L. A.
Contextualization	X	X	----	----	X
Methodology	X	----	X	X	----
Software	----	----	----	----	----
Validation	X	X	----	----	X
Formal analysis	X	X	X	X	X
Investigation	X	X	----	----	X
Resources	X	------	----	----	------
Data curation	------	------	------	------	------
Original	X	X	X	----	----
Revision and editing	X	X	X	----	X
Viewing	X	X	X	X	X
Supervision	X	-------	----	X	-------
Project management	X	X	----	----	-------
Obtaining funding	-------	-------	-------	-------	-------

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