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DIGITAL TRANSFORMATION: PROPOSED THEORETICAL-ANALYTICAL MODEL FOR VALUE GENERATION

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Purpose of the study: The objective of the study was to identify the main strategic domains and their characteristics that enable the proposition of a theoretical-analytical model for implementation and analysis of Digital Transformation (DT) in organizations.
Relevance/originality: Proposition of a theoretical-analytical model for implementing and analyzing Digital Transformation (DT) in organizations, based on the 'state of the art' of the topic (national and international literature from 2017 to 2021), composed of eight strategy domains (or dimensions).
Methodology/approach: Systematic Literature Review, using the Scopus and Web of Science databases as a source of consultation and data collection, between 2017 and 2021, whose selection was based on reading the titles and abstracts of 296 articles, 26 of which were selected for this work.
Main results: Identification of the main strategy domains inherent to DT and its characteristics - customers, data, competition, innovation, value generation, competencies, culture, and agility, which enabled the structuring and proposition of a theoretical-analytical model for implementation and analysis of (DT) in organizations.
Theoretical/methodological contributions: From a theoretical-academic point of view, by extending investigative and analytical research on the topic of Digital Transformation into the interdisciplinary and multidisciplinary field of Information Science, Business Administration, and Computing, and the consequent generation of new knowledge for such fields.
Social/management contributions: From the organizational point of view, by proposing a framework that is not only theoretical, but also applied, allowing the implementation and analysis of DT, and its consequent generation of value for the various types and levels of users, besides the business itself.

Keywords: Digital Transformation, Digital Transformation Strategy Domains, Value Generation, Theoretical-Analytical Model for Digital Transformation.

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TRANSFORMAÇÃO DIGITAL: PROPOSTA DE MODELO TEÓRICO-ANALÍTICO PARA GERAÇÃO DE VALOR

Resumo

Objetivo do estudo: O objetivo do estudo foi identificar os principais domínios estratégicos e suas características que possibilitem a proposição de um modelo teórico-analítico para implementação e análise da Transformação Digital (TD) em organizações.
Relevância/originalidade: Proposição de um modelo teórico-analítico para implementação e análise da Transformação Digital (TD) em organizações, com base no 'estado da arte' do tema (literatura nacional e internacional de 2017 a 2021), composto por oito domínios (ou dimensões) de estratégia.
Metodologia/abordagem: Revisão Sistemática de Literatura, tendo como fonte de consulta e coleta de dados as bases Scopus e Web of Science, entre 2017 e 2021, cuja seleção se deu a partir da leitura dos títulos e resumos de 296 artigos, tendo sido selecionados 26 para este trabalho.
Principais resultados: Identificação dos principais domínios de estratégia inerentes à TD e suas características - clientes, dados, competição, inovação, geração de valor, competências, cultura e agilidade, que possibilitaram a estruturação e a proposição de um modelo teórico-analítico para implementação e análise da (TD) em organizações.
Contribuições teóricas/metodológicas: Do ponto de vista teórico-acadêmico, ao ampliar as pesquisas investigativas e analíticas sobre o tema da Transformação Digital para o campo interdisciplinar e multidisciplinar da Ciência da Informação, Administração e Computação, e consequente geração de novos conhecimentos para tais campos.
Contribuições sociais/para a gestão: Do ponto de vista organizacional, ao propor uma estrutura não só teórica, mas aplicada, permitindo a implementação e análise da TD, e sua consequente geração de valor para os diversos tipos e níveis de usuários, além do próprio negócio.

Palavras-chave: Transformação Digital, Domínios de estratégia da Transformação Digital, Geração de Valor, Modelo Teórico-Analítico para Transformação Digital

TRANSFORMACIÓN DIGITAL: PROPUESTA DE MODELO TEÓRICO-ANALÍTICO PARA LA GENERACIÓN DE VALOR

Propósito del studio: El objetivo del estudio fue identificar los principales dominios estratégicos y sus características que permitan proponer un modelo teórico-analítico para la implementación y análisis de la Transformación Digital (TD) en las organizaciones.
Relevancia/Originalidad: Propuesta de un modelo teórico-analítico para la implementación y análisis de la Transformación Digital (DT) en las organizaciones, basado en el 'estado del arte' de la temática (literatura nacional e internacional de 2017 a 2021), compuesto por ocho dominios (o dimensiones) de la estrategia.
Metodología/Enfoque: Revisión Sistemática de Literatura, utilizando las bases de datos Scopus y Web of Science como fuente de consulta y recolección de datos, entre 2017 y 2021, cuya selección se basó en la lectura de los títulos y resúmenes de 296 artículos, de los cuales 26 fueron seleccionados para este trabajo.
Resultados principals: Identificación de los principales dominios de estrategia inherentes a la DT y sus características - clientes, datos, competencia, innovación, creación de valor, competencias, cultura y agilidad, que permitieron estructurar y proponer un modelo teórico-analítico para la implementación y análisis de (TD) en las organizaciones.
Aportaciones teóricas/metodológicas: Desde un punto de vista teórico-académico, ampliando la investigación investigativa y analítica en el tema de la Transformación Digital al campo interdisciplinario y multidisciplinario de las Ciencias de la Información, la Administración y la Computación, y la consecuente generación de nuevos conocimientos para dichos campos.
Contribuciones sociales/de gestion: Desde el punto de vista organizacional, al proponer una estructura no solo teórica, sino aplicada, que permita la implementación y análisis de DT, y su

consecuente generación de valor para diferentes tipos y niveles de usuarios, además del propio negocio.

Palabras clave: Transformación Digital, Dominios de la Estrategia de Transformación Digital, Generación de Valor, Modelo Teórico-Analítico para la Transformación Digital.

1 Introduction

Schwab (2016) highlights that the society of the 21st century is in the 4th Industrial Revolution, based on the digital revolution and that presents as main features the ubiquity and mobility of the Internet, and Artificial Intelligence (Kitsios & Kamariotou, 2021). Consequently, new discoveries are happening simultaneously in areas ranging from renewable energy, genetic sequencing, to nanotechnology, and the fusion of these areas and the interaction between the physical, digital, and biological domains is what differentiates this 4th Revolution from previous ones (Schwab, 2016).

As a result of such advances, the term "Industry 4.0" was coined in 2011 at the Hannover (Germany) trade fair, and its purpose was to describe how digital would revolutionize the organization of global value chains (Schwab, 2016).

Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian & Haenlein (2021) point out that, due to the legacy they carry, companies established before the emergence of the Internet, or even those created soon after, do not have an information-based paradigm in their management. Therefore, these companies face challenges and barriers between the ways practiced so far and the new ways of doing business when researching and/or trying to implement innovation in their business models aiming at digital transformation.

In this context, the application of technology is fundamental to the development and implementation of strategies that result in the generation of value for their customers, users, partners, and employees, especially considering that technology has enabled the generation of value, that is, collectively, in a network, at low cost, and without depending on time and distance (Pitt, Berthon, Watson, & Zinkhan, 2002).

The challenges of this new scenario do not mean business closure for existing companies, because adapting to the transformation brought by digital is possible (Rogers, 2019), from the adoption of an information-based paradigm (Ismail, Malone & Van Geest, 2019). However, it is important to note that only the adoption of digital tools does not characterize the digital transformation of a business; it is necessary to adapt its organizational strategy (Rogers, 2019). Given this panorama of accelerated changes, the following question arises: which domains should be considered for the structuring of an organizational strategy

aimed at achieving Digital Transformation (DT)? Therefore, the objective of this article is, from a Systematic Literature Review (SLR), to identify the main strategic domains of DT and its characteristics, proposing a theoretical-analytical model for implementation and analysis of DT in organizations.

This theoretical article is structured in five sections. In addition to this introduction, already presented, section two presents the procedures applied to perform the SLR on the theme in focus. Section three presents the DT concept and the main strategy domains that compose it, based on the articles selected in the SLR. Section four presents a theoretical-analytical approach proposition for DT, structured based on the identified strategy domains. Finally, the last section brings the final considerations and suggestions for future work.

2 Method

The SLR used Scopus and Web of Science as query and data collection sources, chosen for being included within the institutional accesses accessible to authors and for having better usability in terms of result filters and simultaneous file downloads.

Publications between 2017 and 2021 were considered, in order to capture the most recent and up-to-date concepts and understandings on the topic. The type of publication included in the search was scientific article, so that the selected content has been previously peer-reviewed and approved, made available in English or Portuguese languages.

As for the knowledge areas, those aligned to the research were chosen, namely: '*Decision Sciences*'; '*Business, Management and Accounting'; 'Computer Science'*; '*Social Sciences*'. The definition of the search terms ('search *strings'*) was guided by the domains defined by Rogers (2019) - 'customers', 'competition', 'data', 'innovation', and 'value proposition' - whose model for DT was used as a structuring basis for this article; thus, the terms used to name Rogers' (2019) domains and the concepts related to them were searched. Table 1 describes the combinations of terms used and the volume of results obtained from the referential search process.

Table 1

Terms, results, and text selection on Digital Transformation

Combination of terms	Results	Selected Texts
Artificial Intelligence and Digital Transformation	121	11
Digital transformation' AND 'Business Intelligence	98	13
Digital transformation AND Competitive Intelligence	30	8
Digital transformation' AND 'Coopetition	6	2
Digital transformation' AND 'Customer	521	25
Digital transformation AND Customer Experience	98	17
Digital transformation AND information management	346	32
Digital transformation AND innovation	295	50
Digital transformation' AND 'Skills	81	16
Digital transformation' AND 'Value proposition	145	16
Digital transformation AND data analytics	79	7
Digital transformation AND business intelligence	98	13
Digital transformation' AND 'Client' OR 'Network' OR 'Community	957	13
Information Science AND Digital Transformation	135	5
Value proposition' AND 'New Technologies	178	9
Coopetition	171	9
Data Strategy' AND 'Digital Transformation	79	21
Information management' AND 'Digital strategy'	451	20
Innovation' AND 'Agility	111	9
TOTAL	**4000**	**296**

Source: Elaborated by the authors (2022).

The initial selection of 296 articles was made from the reading of their titles and abstracts and, thus, it was verified the alignment of the content with the research theme. The 26 articles that make up the main bibliographical reference of this article meet one or more of the following criteria: (i) focus on the conceptualization of DT; (ii) conceptualization of the strategic domains that compose the DT; (iii) presentation of models for operationalization of DT; (iv) presentation of ways to develop a strategic domain that composes the DT. In addition, preference was given to articles that worked with literature review, so that they already brought findings on discussions about the topic.

These criteria were defined because they were aligned with the objectives of this specific study, namely, to identify the main strategic domains of DT and their characteristics, and to propose a theoretical-analytical model for DT implementation and analysis. Books on the theme

of DT and Innovation were also used, both considered references aligned with the respective themes addressed in the paper.

The theoretical framework presented in section 3 deals with the final result of this SLR.

3 Analysis of SLR results - Digital Transformation and its Domains

3.1 Conceptualizing Digital Transformation

DT is characterized by updating the company's strategic mindset, which needs to be approached holistically, and by using technology to restructure the core of the business (Rogers, 2019). Thus, technology is the enabling factor for operationalizing the strategic mindset.

Vial (2019) describes DT as a process that aims to enhance an organization from triggering change through combinations of information, computing, communication, and connectivity technologies. Li, Su, Zhang & Mao (2018) conceptualize DT as an organizational transformation that involves fundamental changes in business processes, operational routines, and organizational capabilities to adapt to an information technology being used by the firm. In this sense, digital transformation emphasizes more on the technological root of IT and the alignment between IT and business. Verhoef et al. (2021) conceptualize DT as the use of digital technologies to develop a new digital business model that enables the company to create and appropriate more value for itself, being intrinsically linked to strategic changes in the business model as a result of the implementation of digital technologies. For Wessel, Baiyere, Ologeanu-Taddei, Cha & Jensen (2020), digital technology is the center and origin of the redefinition of the value proposition, causing the emergence of a new organizational identity. After all, thanks to digital technologies, it was possible to enhance the generation of value - collectively, networked, at low cost, and without depending on time and distance (Pitt, Berthon, Watson & Zinkhan, 2002). These definitions present consensus on the concept of DT, which consists of the use of technology to effect strategies that result in the generation of value in different formats and dimensions. The role played by technology is relevant, but it is used as a means and not as an end in itself. What really characterizes DT is the final (or obtained) value generation, made possible and taken to new heights by the application of technology.

3.2 Digital Transformation Models and Domains

3.2.1 Digital Transformation Models

The need for organizational transformation is a reality and a constant challenge for companies, since the ability to transform oneself allows organizations to grow and obtain

competitive advantages. Although organizational transformation is a customary topic in management studies, the development and proliferation of new digital technologies makes it critical for the survival of companies in increasingly dynamic and intensive markets, in the adoption of these technologies (Tadeu, Duarte & Chede, 2018). As a result of the challenges imposed by the digital age, DT emerges, then, as a new type of transformation and topic to be studied.

Many DT models were proposed by different authors, each with its particularity, applicability to certain businesses and/or sectors. The models also vary in their emphasis, and can be focused on technology, internal competencies, results and impacts of DT, or they can also have a broader scope, considering the holistic view of an organization. For this article, three models were considered, chosen among the articles selected in the SLR, for addressing in a broad and systemic way the main strategic domains to be worked within organizations, in whatever the ongoing or prospective DT process is. These models are detailed below.

According to Verhoef et al. (2021), companies need to access, acquire, or develop digital assets and capabilities, described as the four strategic imperatives for DT. The (i) digital resources represent the ownership and control of assets and capabilities, such as technology infrastructure, digital agility (detecting and seizing opportunities triggered by digital technologies), the ability to act digitally in a network, and big data analytics. A (ii) flexible organizational structure is needed to enable digital change; separate business units, agile organizational forms, and digital functional areas are pillars of such a structure. There are a variety of (iii) digital growth strategies, but the most prominent involves the use of digital platforms, due to their high scalability and enhanced network effects. Finally, (iv) metrics and goals measure performance improvements in key performance indicators (KPIs) to facilitate learning and adjust the business model.

The authors further identify three different stages of digital transformation: (i) information digitization, (ii) process digitization, and (iii) digital transformation itself, which are subsequently linked to strategic growth opportunities and imperatives. Digitization of information consists of converting analog information into digital information, such as the use of digital forms in order processes and the use of digital applications for internal financial statements. In this stage, internal and external documentation processes are digitized, but there is no change in value-creating activities. In the process digitization stage, companies use digital technologies to optimize existing business processes, enabling more efficient coordination between processes and/or creating additional customer value by improving user experiences.

This change often involves the organization of new socio-technical structures that were not possible without digital technologies. The third and most comprehensive stage is digital transformation itself, defined by the authors as the use of digital technologies to develop a new digital business model that enables the company to create and appropriate more value for itself (Verhoef et al., 2021).

Rogers (2019) presents a model with five domains that must be considered for DT to occur in organizations. Domain (i) 'Customers' addresses the networked relationship model, exploring the interaction between the company and its current and potential customers through multiple digital platforms, such as forums and social media, and what results from this, such as brand, reputation and market building, demanding companies to engage with these networks. In the context of DT, sectorial boundaries are fluid and it is possible for businesses in different sectors to compete for the same customers, or for direct competitors to cooperate in key areas, and thus all relationships between companies can be considered a mixture of competition and cooperation, known by the term "coopetition" and worked out in domain (ii) 'Competition'. Domain (iii) 'Data' covers how firms produce, manage and use information. If previously data was expensive, scarce and obtained through deliberate actions, such as market research, in the context of DT companies experience an avalanche of data coming from the most diverse forms. In this context, big data tools are extremely important, as they enable organizations to deal with the large volume of data in order to extract strategically relevant information for their operations. The use of new work methodologies and the application of digital technologies has enabled the testing of ideas to be accelerated and the building of prototypes to occur at low cost. With this, rapid iteration before and after launch and the consequent continuous learning became the new organizational standard, changing the innovation challenge from 'finding the right solution' to 'solving the right problem', thus characterizing domain (iv) 'Innovation'. Domain (v) 'Value' highlights how digital technologies compel companies to think differently about how to create value for customers. Thus, the strategic assumptions in this domain dictate that the firm's value proposition should never be fixed, but needs to keep pace with evolving customer needs, and to do so, the firm must be aware of ongoing changes so that it can discover the next value-generating opportunity and then evolve (Rogers, 2019). Such domains will be further explored in the following subsections, as they constitute the basic structure for the proposal conceived in this work.

In addition to these, Fischer, Imgrund, Janiesch & Winkelmann (2020), from the analysis of nineteen practice-oriented studies, identify and describe six requirements for DT: (i) Digital Strategy, whose formulation determines objectives, actions, governance, and

compliance; (ii) Agility, which represents flexible, adaptable, and responsive organizational structures with management support; (iii) Digital Expertise, which consists of establishing and promoting expertise in new IT-related skills; (iv) IT Innovation, concerning the continuous alignment of business structures with new technologies to benefit from standardization and automation; (v) Collaboration, by preparing and adapting organizational processes to the use of technology, to connect and collaborate with stakeholders (customers, suppliers, competitors, community, etc.); and (vi) Openness, an open organizational culture that facilitates creativity and risk-taking, ensuring the sustainability of DT.

3.2.2 Customer Mastery in Digital Transformation

Rogers (2019) defines customer as any and all relevant groups with which the organization has a relationship, and highlights the variety of these interconnected groups. Customers can be end consumers, business partners, investors, media, government regulators, and employees. With the rise and consolidation of the digital age, customer behavior has changed from a passive to an active and dynamic posture, as nodes in a network who, being in constant interaction, build brands, markets, and strengthen themselves. To explore the interaction with current and potential customers through the multiple nodes of this network, businesses must study the context of their customer base, its trajectory, and learn to exploit its power and potential (Castagna, Centobelli, Cerchione, Esposito, Oropallo & Passaro, 2020).

In this scenario, Singh & Thirumoorthi (2019) describe the customer relationship trajectory in three phases, all enabled by technology. The first concerns preferences related to product/service features, the time for the company to research, understand, and make available what customers say they want regarding products/services. The second phase comprises the customer's preferences regarding the buying process that, enabled by digital technologies, should be easy and convenient, reducing the amount of effort on the customer's part. Finally, the third phase concerns the preferences related to the after-sales service, through which the customer expects fair and transparent treatment, perceptible by the availability and consistency of information. All this provides the customer with a good end-to-end experience.

Rogers (2019) presents the mapping of the evolution of the customer trajectory, from the marketing funnel (whose stages are 'awareness', 'consideration', 'preference', 'action' and 'loyalty'), plus 'defense', which is proper of customers organized in networks. At each stage, customers are influenced by networks, but the 'defense' stage has a greater impact than the others. Here, customers are at a level above brand loyalty, defending the brand on their social

networks, an attitude that feeds back into the marketing funnel and has the power to reinforce the other stages as the funnel narrows. Thus, businesses need to engage, nurture, and inspire loyal customers to enter the 'advocacy' stage so that they contribute to business growth throughout their network (Rogers, 2019).

The author further lists five typical behaviors of networked customers to be considered: (i) 'Access' - desire to simply and immediately access digital data, content and interactions; (ii) 'Engagement' - desire to engage with some type of digital content that is sensory, interactive and aligned to their needs; (iii) 'Customization' - the desire to customize experiences from a wide and ever-expanding assortment of information, products and services; (iv) 'Connection' - the desire to establish connections with other customers, sharing experiences, ideas and opinions; and (v) 'Collaboration' - the desire to collaborate on projects and goals, through platforms designed for this purpose.

3.2.3 *The Mastery of 'Competition' in Digital Transformation*

In the digital age, the boundaries between industries are unclear, as is the differentiation between partners and competitors. Disruptive threats from new technologies are driving competing firms to cooperate to defend their own markets (Rogers, 2019). With this, competition and relationships between firms are being reconfigured, becoming an ever-changing mix of competition and cooperation, so that competition occurs directly in some arenas and in others firms act as partners. Bengtsson & Kock (2014 , p.182) define this relationship as coopetition, "paradoxical between two or more actors, regardless of whether they are involved in horizontal or vertical relationships, simultaneously in cooperative and competitive interactions." Bouncken, Gast, Kraus & Bogers (2015) define it as a strategic process in which economic actors create value through cooperation and simultaneously compete to capture some of the value created. Rogers (2019) describes it as a strategy between competing firms that cooperate to increase their markets of operation while competing with each other to serve it.

According to Verhoef et al. (2021), the ability to act digitally in a network compounds the digital capabilities required for DT by selecting, attracting, linking, and engaging a heterogeneous set of network stakeholders, such as customers, suppliers, and third parties, to meet their mutual needs through digital means, creating value collaboratively.

The core elements of coopetition are the simultaneity of competition and cooperation and the intention to create value (Gnyawali & Charleton, 2018), so that the companies involved achieve mutually beneficial results (Crick & Crick, 2020). The main motivations for forming

this type of strategy are access to resources, knowledge and experience (Crick & Crick, 2020), technological development and innovations (Gnyawali & Charleton, 2018), which lead to the development of new products or new industry standards (Fonseca & Meneses, 2019). Responding to new customer needs by creating value for them is also considered a factor that motivates companies to establish coopetition partnerships (Fonseca & Meneses, 2019).

However, coopetition has an inherently challenging face of conflicting logics and contradictions, arising from the simultaneous pursuit of competition and cooperation. Gnyawali & Charleton (2018) maintain that to maximize value creation and limit value destruction, firms must manage the *trade-offs* between joint value creation and that for each firm, and thus align both for overall value creation. In consonance, Crick & Crick (2020) emphasize that, when initiating a coopetition strategy, companies should (i) seek reliable partners, (ii) clearly establish the extent of cooperation and competition by means of the context in which the alliance is being entered into, and (iii) avoid depending on their partners to survive in their markets, maintaining conditions that allow them to compete through their own resources and capabilities.

3.2.4 The Mastery of 'Data' in Digital Transformation

Data are considered intangible assets for value creation (Rogers, 2019). Rather than simply accumulating assets, the key to success lies in accessing valuable stores of existing information (Ismail et al., 2019). From the combination of large amounts of data, there is the possibility of seeing and understanding the organizational context in a new way and transforming the information found into new business opportunities. This data set is defined as *big data*, and requires a scalable architecture for efficient storage, manipulation, and analysis (Kaufmann, 2019), known as the '5V' dimensions - (i) volume (large amounts of data), (ii) variety (heterogeneous content), (iii) velocity (fast data flows), (iv) veracity (and data quality), and (v) value (what the data can add to the processes in which it is applied). The types of data analyzed for strategy are about business processes, products and/or services, and customers, and can be gathered from exchanges and engagement with users, collaboration with partners, public data, or via purchase or exchange agreements with other companies (Rogers, 2019).

To develop a data strategy, Rogers (2019) posits that the first step is to understand what data is needed and how it will be applied. The author presents three fundamental types of data for this development: (i) data about business processes, (ii) data about products or services, and (iii) data about customers. However, as pointed out by Wessel et al. (2020) and Verhoef et al.

(2021), the organization's external environment is also a source of disruption to the business model and therefore must be monitored.

Once the types that will be worked on in the data strategy have been defined, it is necessary to ensure their alignment with the information technology (IT) strategy. Another point to be considered is data security. Risks of data theft are inevitable, and the data strategy needs to include the development of a legal, risk management, and data security coverage plan (Rogers, 2019).

Thus, the challenges related to data and its management consist, among other issues, of how to structure a team with the necessary competencies and an arsenal of skills to sustain strategy, interconnect company departments through conflicts of interest, share data with partners, and protect them from cyber attacks (Rogers, 2019).

3.2.5 The Realm of 'Innovation' in Digital Transformation

'Innovation' is defined by Rogers (2019) as any change - from an incremental improvement to the creation of something totally new and unprecedented - in a business's product, service or process that adds value. Therefore, innovation is not just about big, revolutionary ideas; rather, it is about anything new that impacts the business. Tidd & Bessant (2015) describe that the core of innovation is the ability to make connections, identify and seize opportunities, i.e., the process of making ideas evolve to the point of having a practical use. Thus, innovation is not only about creating and exploring new markets/products/services, but also means new ways of serving established and mature markets/products/services. Hadjielias et al. (2021) describe innovation as a multifaceted concept that encompasses continuous improvement processes that revolve around the renewal of an organization through the creation of new or improved products, services, or processes. The authors further argue that in the context of DT, the relationship and dependencies between innovation processes and their outcomes become more complex and dynamic. This is because technologies - for example, 3D *design* tools, 5G, digital network technologies, Internet of Things, Artificial Intelligence - often not only influence outcomes, but also affect the ways people engage in the innovation process, the way they interact, and the activities they perform.

In digitization of innovation, both processes and outcomes are shaped by each other and influence each other (Hadjielias et al., 2021). Thus, innovation, in DT, is a spiral process, and requires agile teams that can leverage digital technologies to mutually introduce/enhance markets/products/services. In this context, Rogers (2019) states that companies need to innovate via rapid experimentation and continuous learning. Instead of basically focusing on the finished

product, this approach focuses on correctly identifying the problem and developing, testing, and learning, involving multiple possible solutions. Ideation, rapid experimentation, and continuous learning are approaches heavily exploited by agile methodologies, such as *design thinking* and *lean startup,* used to generate promising ideas and concepts and to shorten product and/or service development cycles (Lichtenthaler, 2020).

Given the varied methodologies and tools, Fonstad (2020) warns that companies' innovation efforts should focus on generating *insights* about what makes a product/service/market offering desirable, viable, and profitable, and develop it based on these *insights*. Such methodologies and tools can be defined and adapted by companies as needed (Fonstad, 2020). As described earlier, the goal of DT is always to generate value, and in order to achieve this outcome, it is essential in the individual development of each of the process domains that there is value generation. In the 'Innovation' domain, this value can be created by the learning generated by the experimentations and by the application and development of the developed solution. It is considered, then, that all parties in the relationship are responsible and committed to value creation.

3.2.6 The 'Value Proposition' Domain in Digital Transformation

Being the main characteristic of DT and permeating the other domains treated, the value proposition should be under constant analysis and reevaluation and, therefore, each new technology should be evaluated in order to understand how it can influence the creation of a new business model. Rogers (2019) proposes that adapting the value proposition is a strategy to be adopted even if the company's situation is considered good; this is due to the speed with which transformations occur in the digital environment. The motto is "adapt before you have to". Thus, the value proposition is defined by the benefits that the customer receives when consuming a company's offering, a value-centric, customer-centric concept. After all, the main axis for a company's transformation towards cocreation involves the collaborative involvement of people to create value experiences, while strengthening the network economy (Ramaswamy & Gouillart, 2010).

Accordingly, Taylor, Hunter, Zadeh, Delpechitre & Lim (2020) describe it as an actor's (customer) belief in the likelihood that another actor (company) will commit sufficient resources to ensure the achievement of its own goal through a marketing interaction. The authors state that the fundamental nature of the firm-customer interaction has changed to a quest by customers for more personalization and deeper relationships. In the face of this finding,

value creation does not take place only through the activities of a single actor (customer or not) or between a company and its customers, but between a whole set of actors, as established by Vargo & Lusch (2016).

According to different authors (Firat & Venkatesh, 1993; Cova, 1996; Ritson & Elliott, 1999; Prahalad & Ramaswamy, 2004; Lusch & Vargo, 2006; Vargo & Lusch, 2008; Payne, Storbacka & Frow, 2008; Payne et al, 2009), the consumer is not only a receiver of the value created by the company, but, in fact, a co-creator of value, at all stages of the interaction process between the company and him. Consequently, perceptions of value ultimately depend on the situational combination of actors' goals that underlie the motivation to enter into a business interaction.

Chesbrough and Rosenbloom (2002) describe the value proposition as the value created to users by means of an offer based on technology, being one of the definitions required in the construction of a business model. For them, companies can capture value from new technologies in two ways: by incorporating it into their current businesses or by launching new ventures that explore it in new areas. Regarding the incorporation of new technologies into existing businesses, Endres, Stoiber & Wenzl (2020) advocate, as a strategic method to drive value generation and gain competitive advantage, the implementation of hybrid business models comprising different combinations of digital and analog elements that meet customer desires.

3.2.7 *Other Digital Transformation Domains*

In addition to Rogers (2019), who proposes in his model five 'domains' to be worked on for the achievement of DT, Verhoef et al. (2021) point out four strategic imperatives, while Fischer et al. (2020) describe six strategic requirements. Table 1 presents a comparative list between the aspects raised by each of these authors.

Chart 1

Comparison of Domains for Digital Transformation

Rogers (2019)	Verhoef et al. (2021)	Fischer et al. (2020)
Customers	Digital Resources	Digital Strategy
Competition	Organizational Structure	Agility
Data	Digital Growth Strategy	Digital Expertise
Innovation	Metrics and Objectives	IT Innovation
Value		Collaboration
		Opening

Source: Elaborated by the authors based on Rogers (2019), Fischer et al. (2020) and Verhoef et al. (2021).

The description of the imperative 'Metrics and Goals' (Verhoef et al., 2021) finds resonance with the description of the domain 'Data' (Rogers, 2019). The same can be said about the requirements 'Collaboration', 'Digital Expertise' and 'IT Innovation' (Fischer et al., 2020) and the domains 'Competition', 'Data' and 'Innovation' (Rogers, 2019), respectively.

The complementary aspects brought by Fisher et al. (2020) and Verhoef et al. (2021) models relate to digital expertise, agility and culture, also raised by Trenerry, Ching, Wang, Suhaila, Lim, Lu & Oh (2021). The latter describe three levels - individual, group, and organizational - composed of multiple factors, which influence DT. At the organizational level, the factors are leadership, human resources, and organizational culture/climate, which unfold at the group and individual levels as adaptability and resilience toward technological change, communication, relationships, and skills and training. Agility refers to the ability to perceive and seize market opportunities provided by digital technologies.

To respond to changing customer needs, the introduction of new digital technologies, and competition intensified by blurring market boundaries and removal of entry barriers, companies must be digitally agile to continuously modify and reconfigure structures and processes, promoting the recombination and development of new products, services, and business models that increase customer value (Verhoef et al., 2021). Sousa-Zomer, Neely & Martinez (2020) confirm that creating agile frameworks is necessary to continue reconfiguring business in a fast- paced digital environment. However, agile practices require an appropriate culture. Cultures that promote openness to change, agility, tolerance for error, and the pursuit of learning are more successful in DT (Hartl & Hess, 2017).

Developing a digital culture, breaking down resistance to digitization, and encouraging transparency-oriented cultures can be achieved by adopting strategies such as reverse mentoring to improve digital skills and competencies (Brunetti, Matt, Bonfanti, De Longhi, Pedrini &

Orzes, 2020). The skills needed for DT, on the other hand, can be acquired via recruitment of experienced employees and/or developed from training (Trenerry et al., 2021).

4 Discussion about the evolution of the theoretical field

The literature discussing Digital Transformation can be, up to this point, divided into three major waves. The first wave consists of content that seeks to understand, discuss, and delimit the concept of DT, and also makes the same move regarding the triggers that lead to DT (Vial, 2019; Wessel, 2020).

In the second wave of the literature the characteristics of DT are discussed, which in this article are called 'dimensions'. There is then the proliferation of studies that bring the definitions of the main characteristics that integrate a DT, being from characteristics that focus on the level of individuals that make up the organizations, such as perceptions and attitudes towards technological change; skills and resilience and adaptability in the workplace, to those that consider the macro levels of organizations, such as organizational identity, technological infrastructure and the organizational structure itself (Bengtsson & Kock, 2014; Bouncken *et al*.,2015; Brunetti *et al*.,2020; Castagna *et al*.,2020; Crick & Crick, 2020; Hadjielias et al, 2021; Hartl & Hess, 2017; Kaufmann, 2019; Klee, Janson & Leimeister, 2021; Lichtenthaler, 2020; Singh & Thirumoorthi, 2019; Sousa-Zomer *et al.*, 2020; Warner & Wäger, 2019).

More recently, in what is considered the third wave of the DT literature, discussions have turned to building DT models and how to instrumentalize them in order to provide directions for operationalizing DT in organizations (Endres *et al*.,2020; Fisher *et al., 2020;* Rogers, 2019; Trenerry et al., 2021; Verhoef *et al., 2021*). This paper is situated in this third wave.

5 Implementation Proposal and Analysis for Digital Transformation

From the aforementioned theoretical discussion, it can be seen that there are different strategic domains that impact the entire DT process and are the support for the transformation to occur. In section three the similarities and complementarities between the three chosen models were explored. Based on this comparison and on the concepts raised in the SLR, this paper proposes the following theoretical-analytical model for the study of Digital Transformation, composed of eight strategic domains.

Figure 1

Theoretical Analytical Model for Digital Transformation Implementation and Analysis

Source: Elaborated by the authors (2022).

The domain 'Customers' is at the center of the model because the major objective of Digital Transformation is to bring differentiated value propositions to this audience. The inner circle, which surrounds the domain 'Customers', includes the domains - 'Data'; 'Competition'; 'Innovation'; 'Value Generation' - that need to be developed for DT to achieve its goal, while the outer circle represents those domains - 'Skills'; 'Agility'; 'Culture' - that support and enable the processes inherent to the inner circle.

Thus, an organizational culture that values learning enables the constant development of competencies necessary for DT and also supports agile behavior. These three aspects enable the processes necessary for the exploration of data, the development of innovations, the establishment of new competitive relationships, thus arriving at the creation of value and its delivery to the customer.

The concepts inherent in each of the proposed strategy domains are the same as those presented by Rogers (2019), Verhoef et al (2021) and Fisher et al (2020). The 'Analytical Theoretical Model for Digital Transformation Implementation and Analysis' drew on the synergies between the three aforementioned reference models, with Rogers' (2019) model as its structural basis, but with a broader approach to the study and application of DT.

A differential brought about by the proposed model is its graphic representation, something that is not proposed by any of the three models used as a basis, and that helps in making the strategic domains tangible and in communicating the model itself in the

organizational context. The circular form was chosen because it is understood that there is no hierarchy among the domains, but that they still relate to and influence one another.

In practice, it is considered that to meet customer demands it is necessary to know them, and this is one of the applications of a good data strategy. Once it has the data in hand, the company will seek to build new value propositions, which can be achieved through its own innovations and/or developed in partnership with other companies, including those that in other fields are considered competitors. To be able to develop new customer relationship strategies, innovation strategies, value generation, competition, from the use of data, it is of utmost importance that the organizations' employees have the technical and social skills to do so. Hence the importance of the domain 'skills' working as a support for the other strategic domains, and an environment of continuous learning is only possible where there is a strong organizational culture in this sense, directing and reinforcing learning actions and skills development.

Another relevant role of organizational culture is to provide conditions for the changes brought by DT. New strategies bring with them new ways of working, directly impacting all the people who make up the organization. A culture that deals well with change, consequently, has better conditions to implement DT. And since change is a certainty in the trajectory of organizations, whether by market or internal demands, 'agility' stands out as a dimension that will provide support, security and speed so that such processes are conducted with method, objectivity, also contributing to innovation. Added to this is the fact that organizations that are more responsive to market changes and customer demands are also the first choice of talents, partners, and resources (Trenerry et al., 2021).

In this sense, Warner & Wäger (2019) highlight that, on the path taken by organizations towards DT, new external triggers arise, recalibrating the need to perceive and seize new opportunities, confirming that DT is not a linear process, but a spiral that builds with each new need to adapt. Thus, the DT model becomes dynamic, in which the dimensions are interacting and influencing each other, united by technology.

6 Concluding Remarks

It is evident that the process for the implementation of DT is complex and, therefore, demands a holistic approach; in other words, the partial development of the dimensions that involve DT will not bring sustainable results for companies, and must, therefore, be carried out in the entirety of its proposal.

As a result of the SLR and its reflection, it is considered that the objective of this article was achieved, having been possible to identify the main strategic domains inherent to Digital

Transformation and its characteristics, which enabled the structuring and proposition of a theoretical-analytical model for the implementation and analysis of DT in organizations.

Furthermore, the results presented confirm the contribution of this work (i) from a theoretical-academic point of view, for the expansion of investigative and analytical research on the theme of Digital Transformation to the interdisciplinary and multidisciplinary field of Information Science, Business Administration, and Computing, and the consequent generation of new knowledge, as well as (ii) from an organizational point of view, by proposing a framework that is not only theoretical, but of potential application, allowing the implementation and analysis of DT, and its consequent generation of value for the various types and levels of users, besides the business itself.

Because this was a systematic literature review, the time factor was a relevant limiting factor in this work. The process of defining a research protocol, conducting database searches, and identifying and defining studies for inclusion in the review demanded a large investment of time, limiting the scope of the research conducted by individual researchers, such as the authors of this paper.

Since this study, in its structure, is theoretical, further investigations are necessary based on the proposals presented here. Future works may, still in the theoretical field, (i) be based on the proposed model to research in depth one or more of the strategy domains presented, or even propose new ones, aiming at the implementation and analysis of DT; (ii) investigate which strategies can be used by companies to develop each of the strategy domains represented in the model; (iii) identify which metrics are essential for each of the strategy domains and for DT as a whole.

In the empirical field, future work may (i) analyze how companies are digitally transforming their businesses and what is the applicability of the model in practice; (ii) compare the differences in the application of the model between different types of organizations, considering their size (large, medium, or small), nature (public or private), or economic sector;

(iii) evaluate the practical applicability of the strategies and metrics suggested in the theoretical research; (iv) instrumentalize the model based on variables and attributes to evaluate the strategy domains; and (v) build a digital maturity analysis model

AUTHORS' CONTRIBUTIONS

Contribution	Oliveira, B.X.	Mafra Pereira, F.C.	Fialho, W.Á.
Contextualization	X	X	X
Methodology	X	X	-------
Software	X	-------	-------
Validation	X	X	X
Formal analysis	X	X	X
Investigation	X	-------	-------
Resources	X	-------	-------
Data curation	X	X	X
Original	X	X	-------
Revision and editing	X	X	X
Viewing	X	X	X
Supervision	X	X	-------
Project management	X	X	-------
Obtaining funding	-------	-------	-------

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