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Governance and Digital Transformation

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Abstract: The article aims to summarize the current knowledge on governance and digital transformation, focusing on strategic and operational dimensions. It identifies research gaps in linking governance, innovation, and the digital transition, attributing limitations to the challenge of accessing confidential organizational data. It suggests using detailed clinical cases for fruitful research, particularly in exploring the operational aspects of governance. Emphasizing the multidisciplinary nature of this research, it acknowledges complexities in conducting studies across financial, operational, and legal domains. However, it sees this as an opportunity to contribute significantly to understanding governance in the context of digital transformation.

Keywords: Digital transformation; strategic governance; data governance; system governance; operational governance.

Introduction

The goal of this article is to suggest avenues of research in an emerging field that deals with governance in relation to digital transformation, a subject of growing interest among the public.¹ In this respect, an analysis of Google queries using the term "digital transformation" bears witness to the growing interest in this topic since 2014. In addition, several studies (e.g., Goh, Kusnadi, Pan, & Seow, 2022) underline the importance of digital transformation management in companies, particularly from the point of view of investors, who show themselves to be sensitive to companies' digital transformation strategy as well as to its reporting in order to assess its relevance and momentum. In light of this interest, we propose a number of avenues for further research on the theme of governance and digital transformation, recognizing that there is still little research in this area. In addition, we suggest that reports from consulting firms can generate relevant research questions and enrich academic work.

We start by defining the concept. Naturally, the digital dimension of management is as old as the use of computers. However, it is essential to distinguish "digital transition" from "digital transformation". The former refers to the gradual adoption of digital technologies to improve existing processes. For example, the introduction of word processing has enabled texts to be digitized and produced more efficiently, while e-mail has accelerated their distribution. While these innovations have been integrated into companies' routines, they have rarely fundamentally altered the way they operate. Digital transformation, on the other hand, implies a profound change in the way an organization operates. In other words, while digital transition focuses on the gradual integration of technologies to improve operational efficiency, digital transformation is disruptive (Christensen, 2013) leading to a radical reinvention of business processes and models.²

Although the academic concept of digital transformation has recently gained notoriety, it has its roots in the 90s (de Souza, Szafir-Goldstein, & Aagaard, 2020). However, the definitions of digital

¹ The 22nd International Governance Conference, co-organized by Professor Vanessa Serret and Professor Anne Stevenot of the CERFIGE laboratory, was held on June 8 and 9, 2023 at the Université de Lorraine (<https://www.univ-lorraine.fr/recherche-et-innovation>). Since 2009, the International Governance Conference has been organized under the aegis of the International Academic Governance Association. This article summarizes and expands on the key points made during the plenary session. The Association Académique Internationale de Gouvernance (AAIG) was founded in 2009, at the 1st edition of the International Governance Conference (Florence, Italy). The AAIG brings together governance researchers from private and public organizations (<https://www.aaig.fr/fr/association-academique-internationale-gouvernance/>).

² <https://www.capgemini.com/fr-fr/wp-content/uploads/sites/6/2022/04/Digital-Mastery-report.pdf>

transformation are still insufficient in the existing literature to capture the complexity of this research object (Reis & Melão, 2023). Generally speaking, digital transformation is the integration of information technologies into the operations of organizations, whether internal or external (e.g., Chaparro-Peláez, Acquila-Natale, Hernández-García, & Iglesias-Pradas, 2020). Several articles (e.g., Reis & Melão, 2023; Wolpert & Roth, 2020) identify the potential benefits of digital transformation, including optimizing physical and digital resources, achieving greater competitive advantage, creating more value for customers and reducing costs. Thus, digital transformation describes a far-reaching change within a company, leading to the development of new business models that can improve its competitive advantage and economic value (Pagani & Pardo, 2017). These digital transformation initiatives often involve reorganizing processes, routines and capabilities, as well as changing the company's business logic (Li, Su, Zhang, & Mao, 2018). Salesforce³ summarizes these elements by proposing a definition according to which digital transformation is "the process of using digital technologies to create new business processes or modify existing processes, culture and customer experiences to meet changing business and market demands".

In the remainder of this text, we identify two lines of research linking governance and digital transformation. The first focuses on the link between digital transformation and organizational governance in its strategic dimension (1.). The second explores the association between digital transformation and governance in its operational or tactical dimension (2.).

1. Digital transformation, organizational governance, and strategy

First, we consider digital transformation from the perspective of organizational governance and strategy. Indeed, a survey by Gartner reveals that 89% of executives say that digital is integrated

³ Salesforce is a software publisher with an international reputation for its customer relationship management solutions.

into all business growth strategies, highlighting the importance of digital in the business world.^{4,5} However, McKinsey observes that although business leaders are increasingly involved in digital issues, the engagement of boards of directors remains limited at present.⁶ For example, only 17% of directors state that their boards support initiatives linked to digital transformation. This finding leads us, firstly, to question the role of boards in shaping digital transformation strategy within their own organizations (1.1). Second, we present four brief corporate case studies (Walmart, Tesla, Nike, and Hasbro) that demonstrate how digital transformation can act as a catalyst for value creation by disrupting organizational strategy (1.2).

1.1 Digital transformation of organizations and the board of directors

Characteristics of directors.

Boards of Directors play an essential role in defining, guiding, and monitoring the implementation of corporate strategy. With this in mind, what are the characteristics of boards that foster digital transformation for value creation? Given that companies can generate value and competitive advantage through innovation, directors who support investment in innovation are seen as effective advisors, irrespective of their oversight role (e.g., Balsmeier, Fleming, & Manso, 2017; Johnson, Daily, & Ellstrand, 1996; Zenou, Allemand, Brullebaut, & Galia, 2020).

To our knowledge, there exists no specific research on this subject. However, the academic literature does highlight the link between board characteristics and innovation within companies. For example, a meta-analysis (Sierra-Morán, Cabeza-García, González-Álvarez, & Botella, 2021) draws on the results of ninety-six studies conducted over a twenty-year period (1988-2018) to examine the relationship between board attributes and corporate innovation. The results suggest that the frequency of meetings and the proportion of independent directors present the most significant positive correlations with innovation. However, these results must be qualified depending on the measure of innovation.

⁴ <https://www.gartner.com/en/newsroom/press-releases/2022-10-19-gartner-says-89-percent-of-board-directors-say-digital-is-embedded-in-all-business-growth-strategies>

⁵ Gartner conducted an online survey in 2022 of 281 corporate directors in North America, Latin America, Europe and Asia/Pacific.

⁶ <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/cracking-the-digital-code>

A recent study (Bolton & Zhao, 2022) based on an analysis of panel data covering more than 13,600 years of corporate activity in the United States between 1996 and 2010, considers the influence of overloaded⁷ and interconnected⁸ boards on corporate innovation.⁹ When directors are overloaded without being interconnected, this entails a negative impact on innovation. On the other hand, when they are interconnected and not overloaded, boards have a positive impact on innovation. Finally, when directors are both overloaded and interconnected, the effects offset each other, and there is no significant impact on innovation. The study concludes that the directors' social network and connections contribute to improving innovation, probably through the acquisition of expertise in innovative activities by sitting on several boards, enabling them to share their knowledge.

Another study (Baum, Lööf, Stephan, & Viklund-Ros, 2018) confirms the positive impact of directors' expertise. Using data on start-ups in Sweden created between 1999 and 2013, it shows that increasing expertise on the board has a significant and positive effect on the propensity of new companies to file patent applications.

Furthermore, the more entrenched and protected directors are from the short-term demands of financial markets, the more likely they are to support innovative investment and patent generation (Bolton & Zhao, 2022; Chang, Hilary, Kang, & Zhang, 2013).

Boards of directors as a collective decision-making group

Beyond the individual characteristics of directors, the composition of the board as a decision-making group can also play an important role in digital transformation. A study by the Boston Consulting Group (Forth, de Laubier, Chakraborty, Charanya, & Magagnoli, 2021) shows that only 35% of companies achieve their digital transformation objectives. Committing to a digital transformation process is therefore committing to a difficult process with a high risk of failure. In this context, a "good" governance is one that enables to better manage these failures and operate effectively in a changing environment that is also difficult to grasp because of its complexity.

⁷ Overloaded boards have a large number of directors sitting on numerous boards.

⁸ Interconnection occurs if a director of company A sits as a director of company B and vice versa.

⁹ Innovation is measured by the number of future patents and patent citations a company generates.

The BCG study also highlights the importance of agility within governance bodies in reducing the failure rate. Agility is the ability of managers to adapt quickly to changes in their ecosystem, by encouraging behavioral change within their organization. However, agility is often conditional on the ability to manage uncertainty effectively (Darvishmotevali, Altinay, & Köseoglu, 2020). Thus, a distinction must be made between situations of risk, where different alternatives are quantifiable, and situations of uncertainty, where it is impossible to assign probabilities to states of nature (Ellsberg, 1961; Knight, 1921). Uncertainty is therefore characterized by the non-existence of a clearly defined future at the time of decision-making. One measure of this agility assesses how governance supports the management of risk and uncertainty associated with change in general and digital transformation in particular.

In this context, a study (Hilary & Hui, 2012) shows that diversification (measured in terms of functional and professional experience as well as formal education) of boards has the effect of reducing ambiguity aversion by increasing collective knowledge among board members. This increase in competence should translate into a better understanding of the distribution of gains and thus reduce the ambiguity¹⁰ associated with uncertain contexts such as innovation. For example, the authors test the effect of this board diversity in the aeronautical sector after the attacks of September 11th, 2001, and observe that airlines governed by a more heterogeneous board reduced their investments less after the attacks and suffered a less negative market reaction than other companies with more homogeneous boards.

Levers for value creation.

¹⁰ Ambiguity aversion is a concept in behavioral economics describing the tendency of individuals to prefer situations or choices that are known, clear and predictable to those that are uncertain, ambiguous, or open to interpretation. Faced with ambiguity or uncertainty, a person with a strong aversion to ambiguity preferentially chooses the option for which outcomes are the most predictable or best understood, even though this option is not necessarily the best in terms of potential gains.

Once the optimal characteristics of boards have been established, we can turn our attention to the strategic growth levers that these boards can activate. Three traditional vectors of value creation linked to digital transformation have been identified by the academic and professional literature.

The first vector is the transformation of procedures through new tools. One of these is Robotic Process Automation (RPA). For example, Deutsche Bank has automated many repetitive, manual tasks in the back office. These robots have been used to automate the transaction reconciliation process, a task that involves comparing transaction data between different systems to ensure they match. Previously, this process required manual intervention and was prone to multiple errors. The bank was able to reduce the time needed to reconcile transactions, increase accuracy, and free up staff to concentrate on more strategic tasks. By improving operational efficiency, Deutsche Bank reports that it has reduced processing costs by 50-60% and has also seen a significant improvement in data quality.

The use of digital twins is another example of a process transformation tool. A digital twin is a virtual representation of a process that can be used for simulation, analysis, forecasting and decision-making. For example, Siemens has integrated digital twin technology to optimize the performance of its wind turbines. With sensors on each turbine, Siemens can collect real-time data on turbine performance, position relative to the wind, vibration, temperature, and other variables. The turbine's digital twin allows Siemens to analyze this data to optimize its operation and predict when maintenance is required. What's more, Siemens can virtually test new configurations for its turbines, without building a physical prototype each time. The digital twin is a tool for increasing turbine life through predictive maintenance, reducing costs associated with unplanned downtime or reactive maintenance, and progressively improving turbine configuration through virtual testing.

In research and development, the cloud¹¹ can also play a driving role. For example, according to a study by McKinsey (2021),¹² an analysis of cloud-related cost optimization opportunities and value-creation-oriented use cases suggests that the cloud could generate over \$1,000 billion in

¹¹ The cloud concept is based on the virtualization of IT resources; physical resources (such as servers, storage, networks, etc.) are managed centrally, then dynamically allocated to users according to their needs. The advantages of the cloud are scalability, accessibility, lower costs and automatic updates.

¹² <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/clouds-trillion-dollar-prize-is-up-for-grabs>

annual EBITDA for Fortune 500 companies by 2030, of which \$770 billion will come from improved capacity to innovate, and accelerated development and deployment of new products.

The second vector is the transformation of the business model. For example, Netflix has shifted from DVD rental and delivery to online movie sales. The third vector is the change of activity, as in the case of Amazon, which, in addition to delivering objects, offers hosting services¹³ via Amazon Web Services (AWS), demonstrating the diversification of its activities.¹⁴ In 2022, AWS accounted for 15.6% of Amazon Group sales. We discuss these two vectors in greater detail in Section 1.2.

More recently, a fourth vector has emerged in connection with extra-financial performance. A recent study (Zhong, Zhao, & Yin, 2023) examines the impact and mechanisms of corporate digital transformation on the environmental, social and governance (ESG) performance of listed companies in Shanghai and Shenzhen from 2010 to 2020. The authors show that digital transformation can significantly improve companies' ESG performance, which in the sample tested translates into overall wealth creation. The three main factors facilitating this digital transformation are combating management myopia, improving the transparency of companies' internal information, and promoting technological innovation.

1.2 Digital transformation and value creation: four concrete examples

To illustrate the various leverage effects associated with changes in business models and activities, we offer four brief case studies.

On August 8, 2016, Walmart, the American multinational retailer, marked the beginning of its own digital transformation by acquiring Jet.com for a total of \$3.3 billion. At the time, Walmart's online sales in the first half of 2016 were well under \$14 billion, compared with Amazon's \$107 billion. The decision to acquire Jet.com was justified by its customer-centric business model, based on an innovative pricing technology called "smart card". The latter is a dynamic pricing process that enables consumers to reduce the price of their order by activating several cumulative levers, such as price reductions during the purchase period, quantity purchases of the same product, non-subscription of delivery options, and the right of return. Walmart's aim was to compete with

¹³ Space rental service for hosting websites, databases, etc. (on-demand *cloud computing*).

¹⁴ <https://www.silicon.fr/cloud-hyperscale-sauve-amazon-tire-google-457631.html>

Amazon by offering similar services while leveraging its network of physical stores. Indeed, Walmart's online sales saw an increase from 2016, reaching 33% growth in 2018. By 2022, Walmart had invested \$14 billion¹⁵ in new technologies. Table 1 illustrates Walmart's positive financial evolution.

Table 1: Activity and profitability of Walmart, Tesla, Nike and Hasbro

	2019	2020	2021	2022
Walmart Inc.				
Sales ¹⁶	514 405	523 964	559 151	572 754
Return on equity	9,46%	20,22%	17,37%	16,66%
Tesla Inc.				
Sales figures	24 578	31 536	53 823	81 462
Return on equity ¹⁷	(15,08)%	4,78%	21,08%	33,6%
Nike Inc				
Sales figures	39 117	37 403	44 538	46 710
Return on equity	42,74%	29,7%	55%	43,11%
Hasbro Inc				
Sales figures	4 720,227	5 465,443	6 420, 4	5 856, 7
Return on equity	21,91%	7,55%	15,81%	6,95%

Source: Refinitiv data

¹⁵ <https://www.marketwatch.com/story/walmart-to-invest-nearly-14-billion-in-automation-and-other-business-areas-in-fiscal-2022-11613752795>

¹⁶ Millions of US dollars

¹⁷ During the Covid crisis, the global automotive industry was affected by a shortage of semiconductors. Tesla's profitability is also impacted by fluctuating prices and the availability of certain raw materials, such as lithium and nickel, essential for batteries.

Tesla, a pioneer in the electric car industry, has enjoyed remarkable success thanks to a direct-to-consumer distribution approach¹⁸ rather than a traditional model based on franchised dealerships. The company operates its own stores and galleries, usually located in high-traffic areas such as shopping malls. These locations serve primarily to inform consumers rather than to sell vehicles on the spot. The majority of Tesla's sales are made online via their website, where customers can configure their vehicle, including options. Unlike traditional dealerships, where negotiating sales prices is common, Tesla offers a fixed price for its vehicles. Once the vehicle is ready, it is either delivered directly to the customer, or the customer can collect it from a Tesla delivery center. The company regularly updates its vehicles' software remotely, enabling owners to benefit from new features and enhancements without having to visit a service center. Tesla's direct distribution model enables it to control the entire customer experience, from initial research through to purchase and after-sales service. Tesla reinvests a significant proportion of its profits in research and development, resulting in a return on equity of 33.6% in 2022 (Table 1).

Nike has strengthened its brand control, optimized customer experience and improved product marketing through digital transformation. Nike has adopted a selective distribution policy, choosing distributors who meet strict criteria in terms of quality, brand image and ability to deliver an exceptional customer experience. At the same time, Nike has terminated contracts with distributors who do not meet the brand's quality standards or do not contribute significantly to its distribution strategy. In addition, Nike strengthened its online presence by investing in its own e-commerce platforms, reducing its dependence on third-party distributors for online sales. These combined initiatives have enabled the company to streamline its distribution network while improving brand perception. This has resulted in steady sales growth, with return on equity reaching 43.11% in 2022 (Table 1).

Hasbro, a company specializing in games and toys, is another example of successful digital transformation. Hasbro's success stems from its ability to create innovative products, market them effectively, maintain strong partnerships and adapt to changes in its sector. Hasbro has invested in the development of games and interactive digital experiences. The company has created various mobile applications, including apps that accompany certain board games, enabling players to use

¹⁸ This model has sometimes been met with resistance due to legislation in some US states or other countries requiring an automaker to work through independent franchised dealers.

their mobile devices to add interactive elements to the physical game. Hasbro has also designed connected toys capable of interacting with other digital devices through sensors, lights and sounds for a more immersive gaming experience. The company is also exploring augmented reality. Hasbro has even created online gaming platforms where players can access a variety of digital entertainment based on card game franchises, such as Magic, the Gathering. Finally, Hasbro collaborates with popular digital platforms to extend its brand awareness. Overall, Hasbro leverages technology to deliver new experiences while preserving the entertainment and creative value of its products, leading to a return on equity of up to 21.91% in 2019 (Table 1).

However, it is important to note that value creation is not limited to strategy alone, which leads us to discuss digital transformation in relation to data governance and systems governance.

2. Digital transformation, governance, and operations.

After studying the meta-strategic¹⁹ and strategic aspects of the digital transition, we will explore the operational dimension of governance in the context of the digital transformation of organizations, in particular the governance of data (2.1.) and the governance of data processing systems (2.2.).

2.1. Digital transformation and data governance

According to the National Institute of Standards and Technology (NIST),²⁰ data governance is defined as "A set of processes that ensures that data assets are formally managed throughout the enterprise. A data governance model establishes authority and management and decision making parameters related to the data produced or managed by the enterprise."²¹

Data management has traditionally been seen as tactical rather than strategic. However, it should be noted that operational mastery of data can bring about a profound change in a company's

¹⁹ Meta-strategic aspects are considerations that will lead to the determination of the strategy such as the determination of the risk appetite or the of the governance.

²⁰ National Institute of Standards and Technology is a U.S. federal government agency under the Department of Commerce, responsible for promoting measurement, technology, and safety standards for various industries.

²¹ https://csrc.nist.gov/glossary/term/data_governance

business model. For example, Briot & Hilary (2021)²² point out that companies historically focused on data management (typically Alphabet, Apple, Meta, Amazon, and Microsoft) are increasingly moving into the banking sector, notably in response to increased competition in their traditional business areas such as payment methods, credit, savings products and financial advice. However, these opportunities for transformation also come up against obstacles. For example, commercial banks, despite having vast amounts of customer data at their disposal, currently face regulatory constraints that prevent them from monetizing this data. In addition, digital transformation is disrupting data management and exposing companies to a number of risks, including regulatory risk, cyber-attack risk and reputational risk. Although data management is essentially an operational concern, the strategic role of governance bodies is crucial in monitoring the operational risks associated with digital transformation.

Indeed, poor regulatory risk management can result in astronomical fines, as witnessed by the Cambridge Analytica scandal involving Meta (formerly Facebook until 2021). In this case, the personal data of millions of users was collected without their consent and used for political profiling purposes. As a result, Meta was fined \$5 billion by the Federal Trade Commission (FTC) in 2019. At the time, this was the highest fine ever imposed on a technology company for this type of violation. In Europe, the UK's Information Commissioner's Office (ICO) also fined Meta £500,000 in 2018 before the General Data Protection Regulation (GDPR) came into force. Since the GDPR (May 2018), maximum fines for serious data protection breaches can reach up to 4% of a company's annual global sales. Poor regulatory risk management can thus lead to significant financial penalties and tarnish a company's reputation.

Digital transformation has also intensified threats to IT data security, so "there are only two kinds of companies: those that have been hacked, and those that will be" (Cowley, 2012). A study (Hilary, Segal, & Zhang, 2016) showed that the average stock market reaction to the announcement of a data leak is historically very limited. However, a more recent study (Tosun, 2021) focuses on cyber-attacks that are more clearly identified as such. The results showed that daily returns were

²² Briot J. & Hilary G. "Faced with new forms of competition, banks will have to evolve". (2021, September 13). *Le Monde.fr*. Retrieved from https://www.lemonde.fr/idees/article/2021/09/13/face-aux-nouvelles-formes-de-concurrence-les-banques-vont-devoir-evoluer_6094495_3232.html

negatively affected in the short term, but that the liquidity of financial assets improved after public disclosure of the cyber-attack. In addition, cyber-attacks have a long-term impact on corporate policies, extending up to five years after the security breach has been disclosed. Research (Kamiya, Kang, Kim, Milidonis, & Stulz, 2021) has also shown that when data attacks result in the loss of corporate financial information, this translates into a significant loss of shareholder value, far greater than the direct costs of the attack. However, this excess loss is reduced when board of directors pay particular attention to managing this risk before the attack. What's more, an attack alters a company's attitude to risk, reducing management's ability to take risks and possibly innovate (potentially furthering its digital transformation).

There is therefore a duty of vigilance on the part of governance bodies (boards and management) regarding the management and notification of cybersecurity risks (Ben Jabeur & Serret, 2019; Rothrock, Kaplan, & Van Der Oord, 2018). As highlighted in Part 1, financial and non-financial information, including customer and supplier information, is increasingly stored in the cloud. The literature proposes tools, such as the construction of an ex ante measure of cyber risk to predict crises (Florackis, Louca, Michaely, & Weber, 2023). Furthermore, corporate data breaches are likened to shocks that negatively affect reputation, while corporate social responsibility (CSR) can offer benefits comparable to those of insurance (Akey, Lewellen, Liskovich, & Schiller, 2021). Several recent academic research studies emphasize the benefits of cybersecurity disclosures for stakeholders. These disclosures are informative for investors (Frank, Grenier, & Pyzoha, 2019) and can help mitigate the negative impacts of a subsequent breach (Wang, Kannan, & Ulmer, 2013).

Unfortunately, many companies still provide little information regarding cybersecurity issues, which can have a negative impact on their reputation (e.g., Amir, Levi, & Livne, 2018; Rubin, 2019). To enhance the effectiveness of boards in this context (North & Pascoe, 2016; Wong, 2014) a study (Radu & Smaili, 2021) examines how the gendered composition of boards influences the level of cybersecurity disclosure. The results show a positive association between the presence and level of cybersecurity disclosure and diversity within boards. In summary, the role of boards diversity in cyber risk management, whether in terms of preventive measures, crisis management or disclosure, is an area that deserves further attention in the academic literature.

2.2. Digital transformation and governance of data processing systems

Digital transformation is also having a significant impact on system governance, largely thanks to the emergence of Decentralized Autonomous Organizations (DAOs). A DAO is an innovative form of organization based on programmed rules in the form of smart contracts, operating on a blockchain (Nakamoto, 2008). A DAO is decentralized in that no central entity controls the organization since decisions are taken collectively by the members (the DAO's token holders). What's more, DAOs are autonomous, meaning that once set up, they operate automatically without human intervention, scrupulously following the rules set out in smart contracts. These contracts, which are actually elements of computer code running on the blockchain, automate various actions in response to predefined conditions. For example, they can manage the distribution of funds, or the approval of proposals based on member votes. The blockchain ensures the transparency and verifiability of all transactions and decisions within the DAO.²³

DAOs have the potential to reinvent the structure and management of organizations, offering a decentralized alternative to traditional governance models. However, they are also controversial, particularly when it comes to security, governance, and contract regulation. For example, DAOs operate as networked entities without a centralized legal entity, raising questions about the relationship between stakeholders and the absence of employment contracts. On the technical side, as the number of transactions increases, the blockchain may experience slowdowns. At present, there is still little empirical research on the governance of these structures, with the exception of one study (Laternus, 2023) which states that "DAOs have experienced a meteoric rise in popularity over the past two years, with \$12 billion in assets under management and more than 2 million users in the space of two years". The study, based on management decisions across eleven market sectors involving 2,377 DAOs on the Ethereum blockchain over a five-year period (2017 to 2022), shows that most of these organizations are FinTechs. The results suggest that, although investments in DAOs can drive innovation and economic growth, they remain extremely risky, with only thirteen DAOs generating average excess returns of 10%. Furthermore, it appears that the valuation of DAO companies is influenced by member voting activity, size, seniority, and activity on GitHub (a collaborative development platform).

²³ Every transaction on a blockchain is transparent to every member of the network; a transaction cannot be modified or deleted, which ensures a high level of accountability and transparency.

Various recent contributions have discussed the advantages and disadvantages of DAOs (e.g., Grover, Chaudhary, Rajput, & Dukiya, 2021; Kaal, 2021; Lafarre & Van der Elst, 2018; Razzaq et al., 2019; Yermack, 2017). Blockchain technology creates the infrastructure for decentralized, networked governance, significantly reducing the costs associated with intermediary agents (Kaal, 2021). As an example, Walmart uses blockchain to track the origin and route of its products as part of its supply chain management, guaranteeing their authenticity and ethical practices (Babich & Hilary, 2020). Compared to centralized governance, a decentralized control structure²⁴ is more reliable, transparent and rapid, reducing the need for multiple intermediaries (Grover et al., 2021). Blockchain can also be a tool for managing certain cybersecurity aspects of data governance (Christidis & Devetsikiotis, 2016; Narayanan, Bonneau, Felten, Miller, & Goldfeder, 2016; Tapscott & Tapscott, 2016).

A detailed study (Yermack, 2017) explores how the use of blockchain could influence corporate governance from the perspective of executives, institutional investors, creditors and auditors. For example, blockchain offers the possibility of resolving certain inefficiencies common in traditional corporate governance, particularly in the relationship between shareholders and the company, and more specifically in the area of shareholder democracy. Annual General Meetings (AGMs) of shareholders in listed companies are often regarded as compulsory and boring annual events, and their important theoretical functions, such as information, forum, and decision-making, are eroded. In addition, the AGM suffers from problems associated with remote voting, such as transparency, verification and identification, difficulties that blockchain technology can solve. Consequently, blockchain can speed up the decision-making process and facilitate rapid and effective shareholder participation. One study (Lafarre & Van der Elst, 2018) also discussed the use of blockchain at AGMs, citing examples such as the blockchain voting pilot program announced by the NASDAQ Tallinn (Estonia) exchange in February 2016 (Abualy, 2019). The transparent nature of blockchain does not guarantee the anonymity of voters, which is not a problem since most companies do not use confidential voting. This technology is also a possible solution to the problems of often inaccurate vote tabulation in certain elections, in particular proxy battles initiated by activist

²⁴ They can become centralized if a few participants hold too much power.

shareholders. Overall, voting would become much more reliable and less costly, and should attract more participation (Pierce, 2018).

Conclusion

Digital transformation is an increasingly pervasive phenomenon that is leading organizations, public institutions and even individuals to fundamentally redefine the way they interact with the world around them. It is becoming increasingly clear that the success of this transformation is closely linked to the quality of organizational governance. This is why we believe it is imperative to conduct more academic research to better understand the link between the two, and the mechanisms by which governance can help or hinder this transformation. This research can provide valuable information for companies, public institutions, and policymakers, and help foster a more effective and responsible digital transformation.

In this article, we set out to summarize the current state of knowledge in this field, and to identify promising avenues of research. We began by examining the meta-strategic and strategic dimensions, then turned our attention to the more operational aspects. In the course of this exploration, we identified several interesting avenues of research. For example, we noted the existence of a literature on the links between governance and innovation. However, studies of these same factors in relation to the digital transition and the levers offered for value creation remain limited in number. We hypothesize that this gap stems in part from the difficulty of accessing data, often internal and highly confidential, relating to organizations' strategies and operations. In this context, we believe that the production of clinical cases, based on the model of the cases discussed in Section 1.2, but presented in greater detail, could be a particularly fruitful avenue of research. We then turned to the more operational aspects of governance related to digital transformation. It became apparent that these aspects offer fertile ground for multidisciplinary research, insofar as they often encompass dimensions related to financial management, operations, and the legal domain. However, it should be noted that such research can be more complex to conduct, requiring the constitution of multi-disciplinary academic teams. Nevertheless, they simultaneously offer an opportunity to make a significant contribution to understanding governance in the context of digital transformation.

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