



The Impact of Digital Transformation on the Marketing Function: A Literature Review

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Abstract: Today's businesses are evolving in a highly digitized environment marked by the lightning-fast development of digital technologies. It is at this level that companies are becoming aware of the need to reinvent themselves and adapt to this new situation by undertaking a process of profound transformation across all organizational functions, including the marketing function. In order to identify the contribution of digital transformation to the marketing function, we have reduced this transformation to its technological aspect, with reference to Pascucci & al (2023). Guided by the literature, this paper paves the way for us to explore digital transformation - through technological innovations - and its impact on the transformation of the marketing function.

Key Words: Digital Transformation, Technological Innovations, Marketing function

1. INTRODUCTION

Given the role of the marketing function in the company as the main function in terms of responding to the needs expressed by customers (Mbam, 2022, p. 4), especially as these needs evolve in parallel with changes in the company's external environment, particularly in the era of technological developments and advances associated with the fourth industrial revolution also known as Industry 4.0, marked by a series of innovations and disruptive technologies such as the universality of the Internet, the Internet of Things, nanotechnologies, cloud computing, Big Data analysis, artificial intelligence and many others (Charles, 2021, p. 20). In this respect, it is easy to see that digitalization has recently received a great deal of attention, particularly in the economic literature, as the way forward for companies seeking to be leaders of change and competitive in their field (Kraus et al., 2022). Indeed, in an increasingly connected world, where fierce competition is disrupting business models, decision-makers have no choice but to embrace digital transformation as an imposed and necessary reality, especially for traditional structures that have not been immersed in the digital culture.

In order to understand the changes that the marketing function has undergone as a result of digital technology, we advocate digital transformation rather than digitalization in order to be able to explore the transition process and the changes brought about by technology in the marketing function, so as not to restrict this phenomenon to the simple integration of technology into marketing practices.

According to Caliskan et al (2020), digital transformation can change all aspects of the business, including marketing (Caliskan et al., 2020). In this sense, a number of authors have attempted, albeit in a limited way, to link digital transformation to marketing (Cioppi et al., 2023; Pascucci & al., 2023; Miklosik & Evans, 2020; Gillpatrick, 2019). In the sense of exploring the contribution of digital transformation to the marketing function, we advocate the approach of Pascucci & al. (2023); according to which digital transformation can be examined from two main perspectives: the first focuses on the adoption of technological innovations, while the second focuses on the actions taken by companies towards consumers (Pascucci et al., 2023).

In the present manuscript; we focus on the first perspective related to the adoption of technological innovations in response to our research question formulated as follows:

How do technological innovations digitally transform the marketing function?

Consequently, this paper seeks, by means of a literature review based on an in-depth analysis of recent academic sources dealing with the impact of digital transformation on the marketing function. Given the evolving nature of the chosen topic, the main sources used include academic journal articles, with particular attention paid to recent papers published in the last five years.

This literature review attempts to present elements of an answer to our research question by clarifying the concept of digital transformation, then focusing on the technological part of the concept linked to technological innovations, and finally emphasising the implications of digital transformation through technological innovations on the marketing function.

2. DIGITAL TRANSFORMATION: KEY DEFINITIONS AND CONCEPTS

2.1 The concept of digital transformation

In terms of definition, the concept of digital transformation varies from one organization to another; However, a large proportion of authors associate digital transformation with the adoption and application of technologies (Herman, 2022; Bresciani et al., 2021; Vial, 2019). As part of an organizational shift to digital technologies such as big data, Analytics, cloud, mobile communication technologies and social media platforms to deliver goods and services (AlNuaimi et al., 2022, p. 637) and increase the value delivered to the customer (Mignenan, 2022, p. 17); Having said that, the integration of technologies is leading to an overhaul of old practices, this is why Vial (2019) describes digital transformation as disruption caused by digital technologies (Vial, 2019); Consequently, in today's business environment, companies are being forced to rethink their business models, offerings and processes; In this sense, a number of authors describe digital transformation as the myriad of changes that digital technologies bring to the business model, such as changing products and organizational structures, streamlining processes and improving customer experience (Fitzgerald et al., 2013); in a complementary sense, Westerman et al. (2014) insist on the fact that the use of advanced technologies goes hand in hand with the use of certain traditional technologies to be able to propose by changing internal processes & customer relationships. In other words, digital transformation requires targeted organizational restructuring (Verhoef et al., 2021). Finally, a third category of authors associates digital transformation with a dynamic and continuous process (Vial, 2019; Dudézert, 2018), as its implementation is spread over time. taking into account the various contributions to the definition of digital transformation, Reis et al. (2018) propose three distinct categories of definitions of digital transformation:

- **A technological definition** combining digital transformation with the use of digital technologies such as social media, mobile technology, analytical or integrated tools (Fitzgerald et al., 2013)
- **An organizational definition** where digital transformation requires changes in operational processes towards the creation of new business models.
- **A social definition** Digital transformation, also known as social transformation, affects all aspects of human life.

As a complement to the above, Table 1 (appendix 1) illustrates typical Main definitions of digital transformation taken from the literature.

So, digital transformation is not a typical project or program that is quickly introduced and implemented in a planned timeframe; to examine the digital transformation stages, we refer to Verhoef et al. (2021) see figure 1:

1. **Digitization** in the sense of the encoding of analog information into a digital format; In other words, the transition from material to immaterial processes through the change from analog to digital tasks (Sebastian et al., 2017); without actually creating value (Verhoef et al., 2021, p. 891)
2. **Digitalization**, as the adoption of digital technologies to improve business; In the digitalization process, ICT's serves as a key enabler to take advantage of new business opportunities by transforming existing business processes
3. **Digital transformation** is the most profound and complex stage of transformation (Gong & Ribiere, 2021) leads to transforming business models by affecting the whole organization and its way to do business.



Fig -1: Digital transformation stages: By the authors themselves based on (Verhoef et al., 2021)

Given that most firms are struggling to digitize et are still in the second stage, especially SMEs and with reference to Pascucci & al (2023), we focus on digital transformation in terms of technology adoption and innovation.

2.2 The Role of Technological Innovation in Driving Digital Transformation.

Although the notion of innovation has been associated with novelty in classical contributions such as J. Schumpeter and F. Perroux (1935), who associate innovation with the introduction of a new product or a new production process, a new organization on the market, successfully (Schumpeter & Perroux, 1935), other authors assimilate innovation to a process, following the evolutionary approach to the firm, which accords a processual and systemic character to innovation (Nelson and Winter, 1928)¹; in the same sequence of ideas, the approach of Baregheh, Rowley and Sambrook (2009) is gaining ground by likening innovation

to "a multi-stage transformation process of ideas into new or improved products or services in order to progress and compete successfully in the marketplace". (Baregheh et al., 2009, p. 1334)

Recently, the Organization for Economic Co-operation and Development gave a general definition of the concept of innovation in this case An innovation refers to a new or improved product or process, sometimes a combination of both; that differs significantly from a unit's previous products or processes (OECD & Eurostat, 2019)

At this level, it should be noted that innovation is not necessarily associated with novelty, as it may be a significant improvement of an existing action; product or process, which is the basis for the definition of technological innovation as used by the OECD: "Technological innovations cover technologically new products and processes, as well as significant technological improvements to products and processes. A technological innovation has been achieved once it has been introduced to the market (product innovation) or used in a production process (process innovation). It involves all kinds of scientific, technological, organisational, financial and commercial activities" (Oslo Manual, 2005).

Although approaches to defining technological innovation differ in some aspects but what they have in common is that it is something new or perceived to be new, and that it is technology-based as advocated by Yoo & al (2010)(Osmundsen et al., 2018, p. 2). In short; technological innovation encompasses a set of new techniques and processes, which are the result of a new technology or the advancement of already existing technologies which refers to the fact that technological innovations can be either radical or incremental depending on the degree of innovation intensity and the scope of integration and application of said technologies.

In this manuscript, we focus on the contribution of technological innovations to the marketing function; By surveying the literature, We found that the technologies most frequently cited in the literature, particularly in research articles, mainly concern social media and social media marketing (Lim et al., 2024; Cioppi et al., 2023; Da Silva Freitas et al., 2023; Shafi et al., 2022; Faruk et al., 2021; Herhausen et al., 2020); massive data analysis represent a very important category; machine learning; algorithms & the internet of things also hold a considerable place in the scientific literature (Mukhopadhyay et al., 2024; Constantinescu & Edu, 2022; Jain et al., 2022; Sestino et al., 2020; Lee & Falahat, 2019); artificial intelligence (Labib, 2024; Potwora et al., 2023; Conti et al., 2023; Rizvanović et al., 2023; Verma et al., 2021), then we were able to extract the top technologies inherent to the marketing field, which we have classified in (table 1) below:

¹ Nelson, R.R, Winter, S.G. (1982). « An Evolutionary Theory of Economic Change », Cambridge, MA, Belknap Press of Harvard University.

Main technologies
a) Social media marketing
A series of software-based digital technologies that enable the emergence of communication channels via an online social network (Lim et al., 2024)
b) Big data analytics
An enormous quantities of dynamic information generated by machines and human beings (Mukhopadhyay et al., 2024, p. 3) characterized by five major characteristics defined by the 5 V's described by Jain et al. (2022) as follows: Volume : the size of the accessible data; Speed : the rate at which the data is collected; Variety : the sources from which the data comes; Veracity : the reliability and certainty of the data; Value : the usefulness of the data extracted from the data received (Jain et al., 2022, p. 1062).
c) Machine learning & algorithms
An automated information analysis and decision-making algorithms that learn and improve at each level of their work on the basis of previous experience'. (Jain et al., 2022)
d) Internet of things
"A global and open network, comprising intelligent objects capable of self-organisation, collecting and exchanging data, but also of reacting to various circumstances and events occurring around them". (Constantinescu & Edu, 2022); or an infrastructure linking physical and virtual objects that can automatically communicate with each other (Sestino et al., 2020).
e) Artificial intelligence
AI can be defined as machines or computers that mimic the cognitive functions that humans associate with the human mind, such as learning and problem solving (Yigitcanlar et al., 2020, p. 3). Adapted to the marketing domain, marketing AI refers to the development of 'artificial agents' with information about stakeholders including consumers, competitors and the company concerned, proposing marketing actions for better marketing results' (Overgoor et al., 2019, p. 2).

Table 1: Top technologies cited in the literature, ranked by authors themselves

Despite their importance, the scientific literature cites less certain technologies related to marketing, such as the Internet (Shafi et al., 2022); chatbots, blockchain (Glaser, 2017); the metaverse (Rizvanović et al., 2023); affiliate marketing(Faruk et al., 2021); SEO (Shafi et al., 2022; Faruk et al., 2021); e-commerce (Mukhopadhyay et al., 2024; Herhausen & al., 2020) and cybersecurity (Da Silva Freitas Junior et al., 2023).

3. DIGITAL TRANSFORMATION AND THE MARKETING FUNCTION: KEY IMPLICATIONS

3.1 Implications for Informational and Strategic Marketing Functions

The technological innovations that have emerged in the 21st century with the globalization of the economy and are closely linked to the massification and transmission of information, and to interconnections (Mbam, 2022, p. 5), have radically changed marketing practices as continuous technological advancement is forcing organizations to change their traditional practices by adjusting their processes and systems up to date (Miklosik & Evans, 2020, p. 101284); so the marketing function was going digital. When we talk about the digitalization of the marketing function, we are referring to the link between digitalization and marketing; Given that a company's survival depends on its marketing and sales performance, since the marketing function is constantly seeking to respond to the needs expressed by customers (Mbam, 2022, p. 4). According to Kotler and Keller (2016), marketing is "*the process of identifying and satisfying the human and social needs of consumers while maintaining business profitability*", or "*the art and science of selecting target markets and obtaining, retaining, and growing customers by creating, delivering, and communicating superior customer value*" (Kotler & Keller, 2016). Understanding marketing digitalization therefore involves studying the implications of digital on the three marketing activities, namely informative, strategic and operational marketing.

Informative marketing refers to the analysis of the external environment, mainly composed of customers and competitors; the gathering and collection of data on customers and competitors is facilitated by the huge amount of data available thanks to new digital technologies, such as Big data analysis and customer profiling techniques (Sundararajan et al., 2022). Every digital activity is transmitted by sensor systems, producing data (Conti et al., 2023, p. 62). Indeed, "*The power of the Web lies in the immediacy of the data collected*" (Arrivé, 2017, p. 52). The challenge for the organization is therefore to process the data collected and make it visible. These technologies make it possible to develop buyer-seller relationships, to quickly understand customers' needs, to predict their behaviour and to respond to their desires (Conti et al., 2023, p. 62), or even more; this data is an opportunity to follow the consumer through his or her Customer Journey (Arrivé, 2017, p. 51). Indeed, thanks to the widespread use of social media platforms and mobile devices, consumers leave continuous digital traces (Miklosik & Evans, 2020, p. 101287) in the form of information "collected passively as consumers go about their lives online"(Figueiredo et al., 2021, p. 5). In fact, data collection, in addition to providing knowledge of customer needs, contributes to the development of the marketing strategy through the segmentation and profiling of customers and the

strengthening of brand positioning thanks to digital communication tools (Conti et al., 2023, p. 62).

in fact, the impact of technological innovations on the marketing function does not stop at the strategic level; it also extends to operational marketing activities Operational.

3.2 Implications for the Operational Marketing Function

In reference to McCarthy (1960)²; we try to reconcile technological innovations in their contribution to operational activities relating to product, price, place and promotion:

- **Product policy:** innovation technologies are a source of digital innovation and new product development, so companies can collect customers' ideas for developing new products or their comments on new concepts (Conti et al., 2023, p. 63). Artificial and augmented reality is currently increasing customer participation in the design phase of new products (Mourtzis & Doukas, 2012), as is 3D printing, but this time in the advanced development phase of new products using digital design files (Holmström & Partanen, 2014); Among other innovations, the latest trend relates to intelligent packaging technologies that enable companies to observe, verify and keep a record of changes in a product or environment, as well as reacting to these changes (Yousefi et al., 2019).
- **Pricing policy:** in the digital age; Instead of fixed pricing, which takes into account supply, demand and location. Prices in the digital age are dynamic. They change every hour for each customer; they focus on the product and, more importantly, on the customer thanks to advanced analyses that generate optimal revenues and develop a satisfying relationship with the customer (Caliskan et al., 2020).
- **Distribution & communication policy:** Big data and analytics are very useful for determining customer values and needs in order to develop a successful omnichannel marketing strategy . In big data, information flows across products, channels, customers, time and place. Technological innovations allow organisations to track customers' online touchpoints, making it possible to predict their future behaviour (Miklosik & Evans, 2020, p. 101286); then companies can then opt for various forms of online media to offer users a total digital experience, and marketers can personalise communication for each customer and develop promotional activities for them (Conti et al., 2023, p. 63).

4. CONCLUSIONS

If we admit that technological innovations favour the digitalization of marketing activities and practices, and in light of the massive race of companies towards digital technologies in recent times, that's why a number of companies have joined the digital transformation recently (Vial, 2019), what has guided scientific literature on the digital transformation of marketing practices (Cioppi et al., 2023; Sunday & Vera, 2018; Shkurupskaya & Litovchenko, 2016) ; because marketing currently represents one of the main functions impacted by digital transformation in the quest for corporate competitiveness (Caliskan et al., 2020). To conclude, this theoretical contribution focuses on the technological aspect of digital transformation as applied to the marketing function. By delving into this area, we have been able to extract the most predominant technological trends in the scientific literature and their implications for marketing activities at both strategic and operational levels.

However, this work remains limited in scope and may be taken up in subsequent research which will build on our contribution focused on the technological aspect of digital transformation, extending it to other dimensions of this transformation, in particular the organisational dimension in the sense of relating technologies to the organisational processes of companies in order to better respond to customer needs and, above all, improve the customer experience.

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Appendix 1 :

Reference	Definitions	Key words
Fitzgerald et al., 2013)	The use of new digital technologies such as social media, mobile, analytics to enable major business improvements: enhancing customer experience, streamlining operations, creating new business models.	digital technologies customer experience streamlining operations new business models.
(Westerman et al., 2014)	The use of digital advances: analytics, mobility, social media, smart embedded devices with the improved use of traditional technologies :ERP to radically improve the performance by changing customer	digital advances customer relationships internal processes value

	relationships, internal processes, and value propositions.	
(Mazzone, 2014)	The deliberate and ongoing digital evolution of the company business model, both strategically and tactically.	business model
(Iansiti & Lakhani, 2014)	The process that changes a business model in two ways: how the organization creates value for its customers, and how it captures that value.	Process Changes business model value
(Hess et al., 2016)	Digital-enabled changes of a business model in terms of products, organizational structures, and processes automation.	Digital Changes Business model
(Dudézert, 2018)	an overall voluntary process of transformation for the company, leading it to review the ways in which it collaborates with its customers, its internal work processes and sometimes even its business model by exploring and exploiting the new possibilities offered by these information technologies.	Process business model
(Reis et al., 2018)	Digital Transformation is the use of new digital technologies that enables major business improvements and influences all aspects of customers' life	Digital technologies Business Customer
(Vial, 2019)	A process that aims to improve an entity by triggering significant changes in its properties through combinations of	Process Changes Technologies

	information, computing, communication and connectivity technologies	
(Nasiri et al., 2020)	Digital transformation is defined as the transformation of business process, culture, and organizational aspects to meet market requirements, owing to digital technologies.	Business process Digital technologies
Bresciani et al. (2021).	Digital transformation is characterized by planned changes based on advanced technologies	Digital technologies Changes
(Verhoef et al., 2021)	A multi-disciplinary process focused on multi-level change based on digital technologies to innovate existing business models or shape new ones.	multidisciplinary process
(AlNuaimi et al., 2022)	A tool based on cutting-edge technology to transform companies' organizational and cultural processes, in response to market changes.	Technology Process Changes
(Elia et al., 2024)	Digital transformation is a multidisciplinary process that orchestrates technology usage, structural changes, value-creation and finally financial issues.	multidisciplinary process Technology Changes Value creation