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The impact of technological innovation on marketing: individuals, organizations and environment: a systematic review

Omar Ali^a , Valmira Osmanaj^a, Mohammad Alryalat^b, Ranga Chimhundu^c and Yogesh K. Dwivedi^d 

^aAmerican University of the Middle East, Egaila, Kuwait; ^bAl-Balqa Applied University, Salt, Jordan; ^cUniversity of Southern Queensland, Toowoomba, Queensland, Australia; ^dEmerging Markets Research Centre (EMaRC), School of Management, Swansea University, Swansea, Wales, UK

ABSTRACT

Marketing is the cornerstone of an organization as it is vital to both strategic planning and business operations. An organization's long-run success depends on its ability to create value for its customers, and marketing plays a crucial role in achieving this goal. This review paper attempts to broaden the body of knowledge concerning the impact of technological innovation on the marketing sector by presenting a systematic review along with a set of paths for future research. A total of 93 articles from 716 articles were systematically selected from different academic journals between 1999 and 2019. The articles were reviewed and summarized according to the individual, organizational, and environmental impact of technological innovation on the marketing sector. The study elaborates on different applications of advanced technologies and their impact on the marketing sector. This will help in conceptualizing the impact of technological innovation on the marketing sector in future studies.

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1. Introduction

Choosing the appropriate marketing strategy is vital for businesses that want to succeed in a highly competitive environment (Kamboj & Rahman, 2015). Marketing is the cornerstone of an organization as it is vital to both strategic planning and business operations (Appiah-Adu et al., 2001). For the purpose of this review study, we have adopted the definition of Marketing approved by AMA (American Marketing Association, 2021): Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. A firm's long-run success depends on its ability to

CONTACT Omar Ali  Omar.Ali@aum.edu.kw

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create value for its customers, and marketing plays a crucial role in achieving this goal (Ahammad et al., 2016). Thus, continuous improvement of marketing performance is a vital management task (Eusebio et al., 2006). Technology is a main driver of changes in marketing for various industries (Ali et al., 2022; Rust, 2020; Mabey & Zhao, 2017). Employing advanced technologies enables companies to provide interactive, two-way communication, hugely contributing to the preservation of long-term relationships and networking (Overby & Min, 2001).

The development and increasing competitiveness of dynamic worldwide markets underscores the need to have timely, relevant information and to take proactive measures to achieve a competitive market position (Craig & Douglas, 2001). Therefore, utilizing advanced technologies is considered a potential medium for worldwide market research (Awan & Zhang, 2013). In the information age and the increasingly networked economy, companies are required to use advanced technologies to promote business growth, labour movement, and interpersonal relationships (Breidbach et al., 2013). Companies need to adapt their business practices in response to new technologies, new management techniques, and a volatile communications landscape (Saura et al., 2017). Increasingly widespread connectivity has promoted the creation of the digital economy, defined as '*a new socio-political and economic system characterized by an intelligent space consisting of information access tools and information processing and communication capabilities*' (Baye, 2016, p. 7). Digital marketing offers a concurrent integration of web strategies, processes, and methodologies to fulfil specific objectives using different tools (Dwivedi et al., 2021). It can also stimulate changes at the micro and macroeconomic levels, and this requires changes in marketing practices and theory (Krishen et al., 2021; Dwivedi et al., 2023a). From the customer's perspective, digital marketing has revolutionized the way purchasing decisions are made; consumers can now collect and evaluate information across various channels (Leeflang et al., 2014; Dwivedi et al., 2023b). The same applies to business markets (Rangarajan et al., 2020).

The rapid pace of technological innovation and development brings up the question: How does aligning business functions, specifically marketing, with new technologies, impact overall business performance? Evidence indicates that applying advanced technologies contributes to overall business performance (Rivard et al., 2006; Dwivedi et al., 2023), as does marketing (Taghian & Shaw, 2008), which makes them both immensely important. Several case studies have focused on the impact of technological innovation on marketing success (McKenzie-Mohr et al., 2012). However, most of the evidence concentrates on the overall organizational performance, and there are a very limited number of studies examining the impact of technological innovation on marketing nor the impact of the alignment between technological innovation and marketing on organization performance. Hence, a systematic review (SR) is needed, which summarizes the research implications from the literature as these are considered reliable and valid in comparison to controlled trials or case studies. Conducting systematic analyses is fundamental to assessing the academic growth and maturity of any given discipline (Williams & Plouffe, 2007). By reviewing past research, we can provide an overview of the progress achieved in a particular field of study, identify potential gaps, extend prior research, and derive future research directions. (Hulland & Houston, 2020). Marketing has grabbed the attention of various scholars and practitioners from divergent disciplines, and this

has materialized in an increased number of academic and business articles published globally (Dan & Zondag, 2016). Marketing researchers have investigated the progression of marketing thought (Wilkie & Moore, 2003) as well as marketing research practices, patterns, and paradigms (Zinkhan, 2006). Other researchers have studied marketing research authorship (Eaton et al., 1999) and citation patterns (Peterson, 2005). In researching specific facets of the marketing literature, Nasir (2005) tracked the development, change, and transformation of management information systems by analysing articles published in business and marketing journals. Williams and Plouffe (2007) performed a content analysis of knowledge development in industrial sales management, reviewing more than 1,000 articles published in 15 major journals between 1983 and 2002. The present review study draws upon a similar line of inquiry, investigating the state of research on the impact of using advanced technologies in marketing between 1999 and 2019. The findings of this review study will give a clear answer on the main research question: *What is the impact of technological innovation on marketing sector?*

The article provides a background on advanced technologies in marketing and research methodologies. In addition, a research classification framework is developed and proposed based on the findings of our review, followed by a discussion and an articulation of the unique contribution of this review study.

2. An overview of technological innovation in marketing

The current business environment is characterized by huge information flow, dynamism, hypercompetition and globalization; thus, an efficient and successful business must be flexible and react swiftly to changes in the market. A business response is driven by a constant, accurate, and prompt flow of information obtained through information technology (IT) (Avramović, 2010). The unremitting development of communication and IT has significantly implicated business functions, such as sales and marketing, procurement, finance, accounting, research and development. Researchers have analyzed various ways in which technological innovations are embedded in marketing practices. In the current section, we discuss some of these technologies and their implications in marketing.

Mobile Technologies, incorporating the use of portable computers, mobiles and other handheld devices are utilized by firms to interact with their customers and partners (Fujimoto et al., 2016; Shareef et al., 2017). Moreover, small firms adopt mobile technologies not only to communicate with their clients and customers but also to initiate business transactions (Eze et al., 2019). The use of mobile marketing devices is regarded as a substitute for virtual marketing and assists Small and Medium Businesses (SMEs) to boost their sales promotions strategy and increase the sales of their products and services (Eze et al., 2019). Virtual marketing refers to the “marketing activities that have an insertion of all types of social networking tools to create the brand image of products or services” (Thuse, 2016, p. 42). On the other hand, mobile marketing is defined as “a set of practices that enables organizations to communicate and engage with their audience in an interactive and relevant manner through and with any mobile device or network” (Mobile Marketing Association, 2009).

According to ITU (2019), 97% of the world's population lives within reach of a mobile cellular signal, and 93% of the world's population lives within reach of a mobile broadband. The peculiar nature and the mobility of mobile marketing applications distinguish it from any other form of promotional and communication tools, which today is considered to have a massive implication for small businesses (Eze et.al, 2019) forcing firms to employ marketing techniques for specific devices to market their products or services through different channels (Cox, 2011). For instance, in a retailing environment, mobile marketing has the potential to change the paradigm of retailing from one based on consumers entering the retailing environment to retailers entering the consumer's environment through anytime, anywhere mobile devices.

Cloud Computing has enabled users to access data stored in databases and to manage service configurations (Ali et al., 2020), helping organizations to allocate resources in an optimal way (Ali et al., 2018a). The rapid development of cloud computing technology, and the low cost and high efficiency of cloud computing services bring an opportunity for enterprises to develop e-commerce activities (Wang, 2019). Chowhan and Saxena (2011) claim that combining the CRM and cloud computing application processes helps organizations to identify and target their best customers, generate quality sales leads, and plan and implement marketing campaigns with clear goals and objectives. Moreover, it also helps the formation of individualized relationships with customers and provides the highest level of customer service to the most profitable customers (Chowhan & Saxena, 2011). Various studies have identified the application of cloud computing as a potential approach that allows SMEs to mitigate international barriers and exploit opportunities offered by foreign markets (Hosseini et al., 2019; Ali et al., 2015). The cloud may be combined with other technologies, such as location-based services and social networks, to offer remarketing (Palos-Sanchez, 2018), or it can be used to process big data and data analytics to improve customer experience and customer loyalty programs (Buhalis & Volchek, 2021).

Internet of Things (IoT) comprises the use of smartly connected devices and systems employed to optimize data collected on machines and other physical objects through embedded sensors and actuators (Hoffman & Novak, 2018). Attaining meticulousness and comprehensive consumer data enables the firms to target desired audiences, increase conversion rate and raise brand awareness (Abashidze & Dąbrowski, 2016; Mora et al., 2021). IoT permits firms to collect and analyze data about the environment and customers' individual attributes, allowing for new, personalized and reality-augmented services that involve little or no human interaction (Vermesan et al., 2011). Henceforth, product design evolves into connected and dynamically reconfigurable service platforms, in which personal data is used to personalize for products, leading to new business models (Ng & Wakenshaw, 2017). Moreover, Niyato et al. (2016) in their study presented a big data market model utilized to develop the optimal pricing scheme that permits the service provider to determine the amount of data to be obtained through big data and IoT, to offer services to the users. Utilizing the IoT technology enables marketers to plan and conduct marketing campaigns in a completely innovative manner (Abashidze & Dabrowski, 2016).

Artificial Intelligence (AI) is a set of programs, algorithms, systems and machines that demonstrate intelligence (Ali et al., 2023; Shankar, 2018), where the machines are capable of imitating ‘*intelligent human behaviour*’ (Syam & Sharma, 2018, p. 136). Nowadays, the applications of AI are expanding into daily life activities (Kulakli & Osmanaj, 2020), allowing firms to track real-time data, analyse them and respond rapidly to customer requirements (Wirth, 2018). The obtained insights on consumer behaviour is considered crucial not only for new customer attraction and customer retention (Verma et al, 2021) but also to incite the customer’s next move and redefine the overall experience (Balajee, 2020). Thus, many firms make use of AI tools to extrapolate customer expectations and navigate the future path (Shabbir & Anwer, 2015). Davenport et al. (2020) argue that AI will influence marketing strategies, including business models, sales processes, and customer service options, as well as customer behaviours.

In sum, it is observed that the role of technological innovations in improving the performance of marketing has been overlooked, and further recognition must be given (Lioukas et al., 2016). Through this study, various ways technological innovation affects the way marketing is organized and performed are explored. For this purpose, not only the impact technological innovation might have on the performance of marketing is investigated, but also the organizational, individual, and environmental dimensions underlying such technology-enabled exchanges are considered.

3. Research methodology

A SR is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, topic area, or phenomenon of interest (Kitchenham & Charters, 2007). Also, it is defined as a methodology, which summarizes the process of collecting, arranging, and assessing existing literature in a review domain (Dabić et al., 2020). A SR was appropriate based on the purpose of the research, which is to identify research gaps in current research and to offer suggestions for future research (Ali et al., 2023; Hao et al., 2019). It is considered to contribute significantly to the understanding of the research area, identifying lacunas and suggesting forthcoming research themes (Khatoun & Rehman, 2021). SRs have become increasingly important in any sector, in particular the marketing sector (Kamboj & Rahman, 2015). Marketing people read SRs to keep up-to-date with their field, and the reviews are often used as a starting point for developing marketing practice guidelines (Moher et al., 2009). This SR is based on the structure process proposed by Watson (2015) which explicitly prescribes the steps and processes for searching. These searching process steps include planning, execution, and reporting. It is challenging for marketing consultants and experts to check relevant articles for evidence-based practice because of the huge numbers of continually updating information systems (IS) and marketing publications (Bastian et al., 2010). Moreover, when marketing consultants and experts make decisions, they should not focus only on the results of one study, as some studies may elicit prejudices, making the results inconclusive (Abbas et al., 2008). In both practical and theoretical work, marketing consultants and experts must rely on strong evidence to inform practice. According to Evans (2003), a SR is one of the preeminent approaches that aid evidence-based marketing practice. Boell and Cecez-Kecmanovic (2015) claim

that the rigor of following a predefined protocol and particular search process, makes SR an efficient approach.

Applying the rules and guidelines of SRs is crucial for researchers who undertake the SR approach (Kitchenham & Charters, 2007). Commencing the review process by using a protocol to identify, select, and assess the relevant literature will make the SR highly efficient (Tranfield et al., 2003). The systematic process should be reproducible, objective, transparent, unbiased, and rigorous (Boell & Cecez-Kecmanovic, 2015). The SR approach adopted in the current paper embraces the strategies and rules depicted by Kitchenham and Charters (2007) and Ali et al. (2018b, 2020, 2021). This review study is conducted several collective rules and guidelines were applied for the different steps of this SR, that were identified by Kitchenham and Charters (2007) and Ali et al. (2018b, 2020, 2021). Rules and guidelines applied during the planning stage include the identification of the need for a SR, defining research questions, defining classification framework, and defining research strategies. For the execution step, this review involves keyword search, applying filters, reading title and abstract, reading full articles, backward snowball and quality assessment. In the reporting step, this review included classifying the selected articles and discussion of the results. The steps, rules and guidelines that are applied for this SR are described in Figure 1.

3.1. Planning stage

The first step of the planning stage is to identify the requirements of the SR. The need for a SR arises from the requirement of researchers to summarize all existing information about some phenomenon in a thorough and unbiased manner. As argued in the previous section, despite the dynamic research on the impact of technological innovation on marketing, there is no SR that outlines the discoveries and provides a profound analysis of the research and practice in this topic, in particular the impact of using these advanced technologies on organizations, individual, and the environment.

Defining the research questions is the second step in the planning stage, which is considered a crucial step in any SR (Ali et al., 2021). Any SR achieves its goals when it can answer the research questions. The formulated research questions for this SR study

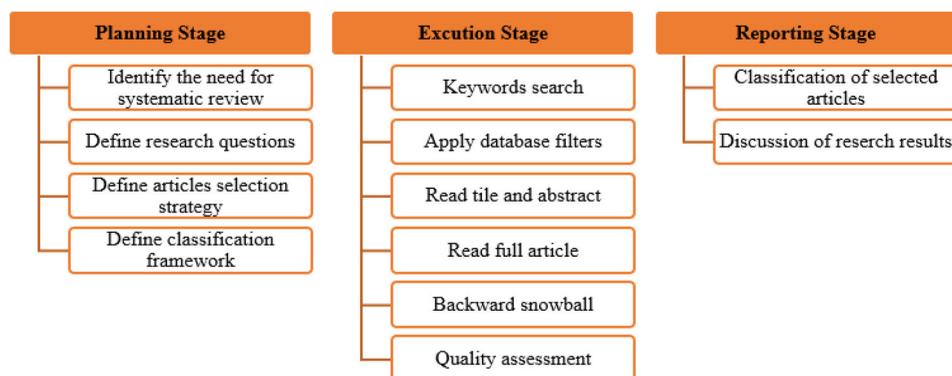


Figure 1. Systematic review stages.
Source: Author's own.

include a general focus research question (i.e., overarching research question) and research sub-questions as follows: General focus research question: *What is the impact of technological innovation on marketing sector?* Research sub-questions are as follow:

- *What is the organizational, individual, and environmental impact of technological innovation on marketing?*
- *What are the current trends and commonalities among advanced technology-enabled marketing functions?*
- *What are the outcomes of previous studies, and what are their implications for future research?*

Answers to the research sub-questions will, in combination, help to address the general focus research question, and the answer to the general focus research question will give directions in which an incremental contribution to the current state of knowledge on the research topic can be made.

The third step of the planning stage consists of developing the research review protocol, which serves as a base to understand the current theoretical and practical perspectives on the topic. In this research, the review protocol specifies the methods that will be used to undertake a specific SR. A predefined protocol is necessary to reduce the possibility of researcher bias. For example, without a protocol, it is possible that the selection of individual studies or the analysis may be driven by researcher expectations. The initial classification framework was authored by Ngai and Wat (2002); they used it to conduct a SR of the applicable journal articles related to spontaneous customers within marketing. The classification framework was based on the literature review, the nature of electronic commerce research, and the work of Kalakota and Whinston (1996) and Turban et al. (2000) as well as existing classification schemes of IS by Alavi and Carlson (1992) and Barki et al. (1993). In Ngai and Wat's (2002) review study, the articles were classified into four broad categories: (i) applications, (ii) technological issues, (iii) support and implementation and (iv) others; and each is divided into other subcategories.

The current review study embraces an adjusted version of the comparative classification framework applied to electronic commerce in the marketing sector which is proposed by Ngai and Wat (2002). A similar type of classification tables also has been applied in marketing capabilities and firm performance research conducted by Kamboj and Rahman (2015). In this review study, the proposed classification framework has been updated by adding three new directions related to the impact of using advanced technologies on marketing, specifically the impact to the organization, individual, and environment. Also, the framework is divided into six different categories which group several factors into each category and this is based on the findings of the review of the selected articles.

The developed classification framework encompasses six specific categories, and each category has different specific factors. Each category and the factors are as follows: (1) Management support, which is the focus on managerial uses of information resources. It includes increased employee knowledge, information sharing, information quality, marketing management, and sustainability (Adams et al., 2019). (2) Computer staff support, which is the support that provides help regarding specific problems within the system or tools that been used in the organization. It includes problem solving, reduced time,

information exchange, and building customer database (Lioukas et al., 2016). (3) Ease of system use is a basic concept that describes how easily users can use the organization system. It includes ease of learning, integration of marketing activities, and employee satisfaction. (4) Individual performance refers to the individual need to increase some skills related to a particular task. It includes improvement of quality, increased productivity, marketing skills development, and skills to segment and target markets (Baye et al., 2016). (5) Firm performance comprises of real results or outputs compared with intended outputs. It includes increased competition, more profit, industry leader, promotion, marketing plans, distribution channels, price, financial goals, effectiveness of advertising, and business strategy (Aksu et al., 2018). (6) Customer orientation is a business philosophy that puts the needs of the customer over the needs of the business. It includes customer value, customer satisfaction, customer retention, customer knowledge, and customer relationship (Grover et al., 2018) (see Figure 2). In all, 93 articles that were part of our review covered all six categories of the classification framework, namely, management support, computer staff support, ease of system use, individual performance, firm performance, and customer orientation. For more details about the steps and the processes for the article selection, please check the next sections.

The research classification framework, illustrated in Figure 2 was developed to review the literature related to the nature of the impact that technological innovation has had on marketing research.

Defining the strategies for article selection is the fourth step of the planning stage. Strategies for article selection are intended to identify those primary studies that provide direct evidence about the research question. In order to reduce the likelihood of bias, strategies for article selection should be decided during the protocol definition,

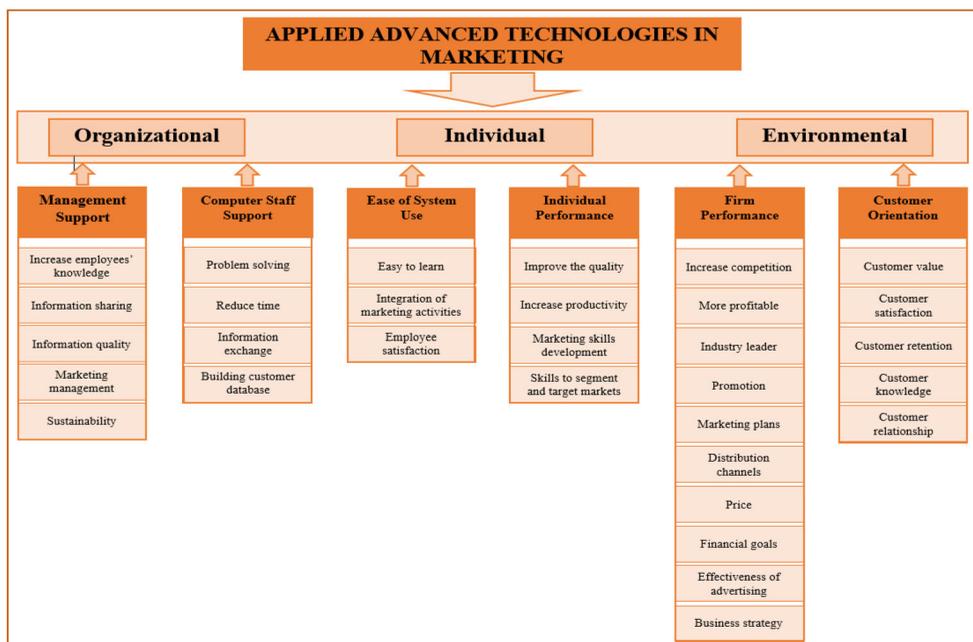


Figure 2. Classification framework.
Source: Author's own.

although they may be refined during the search process (Dabić et al., 2020). During this step, an integrated search strategy was adopted to cover an extensive automated search of different online databases and a manual review of the selected articles.

Embracing an extensive automated search strategy enables the integration of the most fitting online sources (Rosado-Serrano et al., 2018). For this SR, the chosen online databases include EBSCO, Emerald, and IS Web of Knowledge. Moreover, for every chosen database, appropriate filtering tools were utilized to restrict the research results (McLean & Antony, 2014). During the manual review, the broad manual review method was embraced; it involved first, reading the title and abstract of each research article (Golder et al., 2014), then, reading the full content of the selected articles to exclude irrelevant ones (Ali et al., 2018b, 2021).

In addition to the extensive automated search and manual review, the backward snowball technique was used to discover articles that could not be identified through the previous strategies. This technique employed a reference rundown to identify new articles (Wohlin, 2014). The backward snowballing technique began by analyzing the reference list and removing articles that do not satisfy the key research criteria, such as language, publication year, or type of publication. Then, articles that were already examined and discovered were removed from the rundown. The remaining articles can potentially be incorporated into the study.

3.2. Execution stage

During the *execution phase*, the strategies specified in the planning phase were used to select relevant articles for our study. The main techniques applied in our study are explained below:

- Identifying the search terms is an ongoing process, which begins with using unique search words from articles that are recognized in the area of study (Hu & Bai, 2014). The process ends once all the well-known articles are found using the same principles as above. The selected databases in our study are enabled with advanced research features, allowing the combination of relevant search words. In this research study, we identified the following keywords: ‘information system’ AND ‘information technology’ AND ‘innovation’ AND ‘advanced technologies’ OR ‘cloud computing’ OR ‘internet of things’ OR ‘mobile technologies’ OR ‘social media’ AND ‘organizations’ OR ‘businesses’ OR ‘enterprises’ OR firms AND ‘performance’ AND ‘impact’ AND ‘marketing’ OR ‘digital marketing’.
- While searching the online databases, filtering tools were applied to optimize the research results (Zhang et al., 2014). In this research, we applied various filters, including the research area (IS and marketing), year of publication (1999 to 2019), document type (journal articles), and language (English). For more details see [Table 1](#).
- Once the results were attained, the articles were manually checked, focusing on the title and abstract, to ensure that they are relevant to the topic of the current study (Pucher, 2013).
- All the articles obtained from the previous step were thoroughly analyzed for relevant information on our research topic (Shea et al., 2007).

Table 1. Selection criteria.

Criteria	Inclusion	Exclusion	Rationale
Publication Type	Scholarly articles	None: academic resources	To make sure that the research retrieves information from academic sources
Peer-reviewed	Peer-reviewed	None reviewed: abstracts, books, and dissertations	To make sure the quality of the used articles
Year of publication	Articles published 1999 onwards	Articles published before 1999	The current review involves the last decade (1999-2019), however no studies, in the context of the review, are published before this date
Language	English language	Any languages other than English	English is the official language for research articles

Source: Author's own.

- To identify articles that were not attained through the automated research strategy, we employed the backward snowball technique (Spanos & Angelis, 2016).
- To confirm that all the articles included in our research were of value, we applied quality assessment criteria (Hu & Bai, 2014). A checklist was prepared to assess and decide on whether or not to include an article. The checklist questions were adopted from the studies conducted by Ali et al. (2018b, 2021) and Sadoughi et al. (2020). It included the following criteria: The discussion on the research objectives is clearly identified. The research problem and questions are clearly stated. The data used are available and well described. The adopted methodology is thoroughly elaborated. The research results are presented in a comprehensive manner and answer the research questions.

This research used the quality score to investigate whether the results of the primary study were associated with study quality, and also investigated whether some of the individual quality factors (i.e., sample size, validation method) were associated with the primary study outcome. After selecting the primary relevant studies, it is necessary to assess the quality, in order to minimize bias and maximize the validity of our SR. So, the 93 remaining articles were assessed based on quality criteria. We assessed the selected studies in terms of scientific diligence, reliability, accuracy, and propriety, to ensure that research concepts and methods are respected. We assessed whether results were targeted, original, pertinent, and useful for future researchers, and experts as well as enterprises. These criteria were essential to provide valuable and significant contributions to the research community. These selected studies were classified according to its main research aims, methods, contributions, and results. This categorization has enabled us to identify, extract, classify and synthesize data responding to research issues.

The current review study took place from January 15, 2020 to April 15, 2020, following the research protocol stated in the planning stage. The initial search, based on the defined keywords, identified 716 articles. After applying all the steps, 93 research articles met the quality assessment criteria.

3.3. Summarizing stage

This section explains the final number of articles selected for the present review study. Specifically, based on the initial research process (keywords), 1273 unique

articles were found. After applying filters, the number of articles was reduced to 716. The researchers then conducted a manual review to identify articles irrelevant to the study. In this process the researchers focused on both empirical and conceptual articles that are directly related to the topic of this research. As a result, 518 articles were removed, and the number of remaining articles was 198. Next, the full article reading process was carried out, where the researchers concentrated on a specific criterion such as objectives, the research questions, the description of the collected data, the methodology that applied, and analysis technique that was used to analyze the data and finally the presentation of the results. As a result of reading the full articles, another 96 irrelevant articles were removed, which concluded in 102 remaining articles. The backward snowball technique was subsequently applied, which added 12 more articles for a total of 114 articles. Finally, after checking the quality assessment criteria, 21 articles were removed, reducing the number of articles to 93.

3.4. Some common attributes of the selected articles

Distribution of Articles by Publication Year: The earliest publications on the impact of technological innovation on marketing date from 1999 (see Figure 3). Researchers observed that the highest number of articles, 10, was published in 2011; and the lowest number of articles, two, was published in 2018. Most of the published articles were published between 2011 and 2015, thus signifying the recent interest in this research area.

Distribution of Articles According to Classification Framework: The research topic is organized into six categories: management support, computer staff support, ease of system use, individual performance, firm performance, and customer orientation. Figure 4 displays the quantity of articles published each year in each category. Thus, the aggregate number of articles published under management support is ($n=22$); computer staff support is ($n=11$); ease of system use is ($n=5$); individual performance is

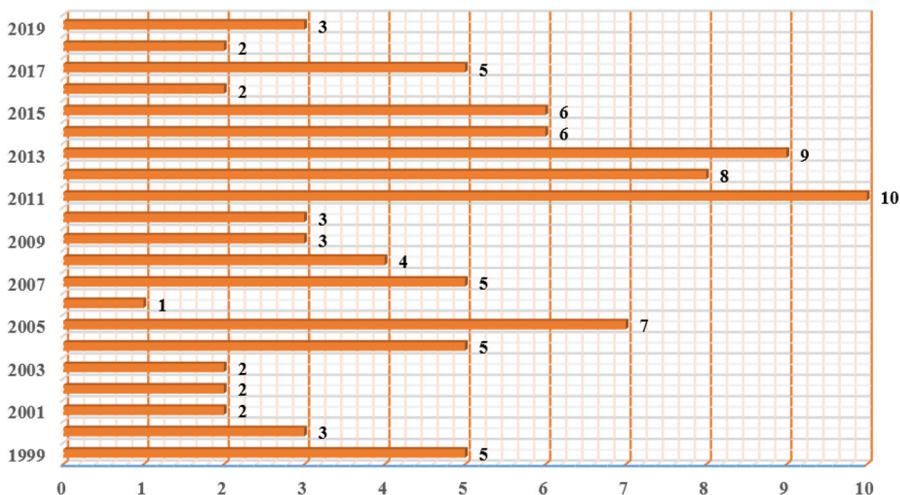


Figure 3. Publications by year.

Source: Author's own.

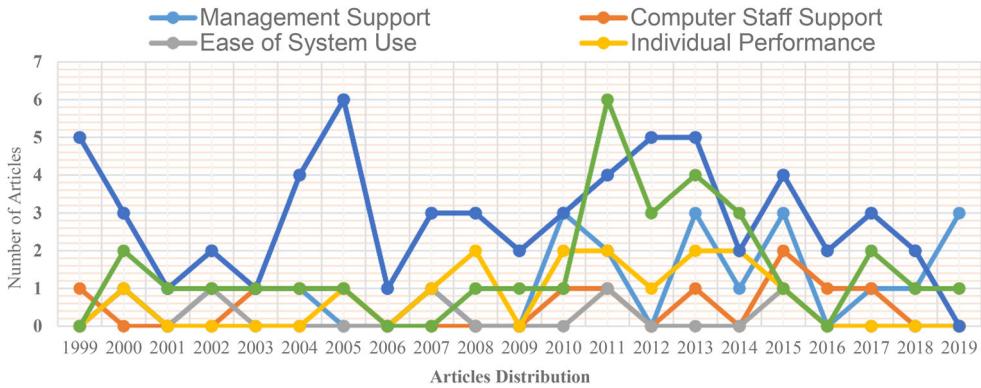


Figure 4. Research topics according to classification framework.
Source: Author's own.

($n = 15$); firm performance is ($n = 61$); and customer orientation is ($n = 31$). It results that majority of the articles investigating the impact of technological innovation on marketing are related to firm performance (Figure 4).

Nevertheless, the number of the studies focusing on firm performance has dropped significantly in the past five years. The impact of technological innovation related to customer orientation is another topic of interest to many researchers, being the second most studied topic per our classification framework. Technical aspects, such as ease of system use and computer staff support, were analysed sporadically over the research period. The same can be said of individual performance aspects. Meanwhile, management support has gained increased research attention in the last decade.

4. Research synthesis and propositions

The research framework was categorized by organizational, individual, and environmental impact. In addition, several main factors that affect marketing were identified. All these determinants were grouped under the different categories (Table 2). The six main categories identified are explained in detail in the following sections.

4.1. Management support

The different factors used to measure management support are summarized in Table 2. The management support category shows contributions in marketing management, knowledge, information quality and sharing. Kamboj and Rahman (2015) provide a SR of marketing capabilities and find that the mediating role of marketing capabilities on firm performance should be pursued. In line, Zhao and Priporas (2017, p. 13) propose an integrated framework and introduce shared control as an inter-firm governance mechanism. They also emphasize that knowledge and information sharing ‘can help to inform more appropriate marketing decisions and more appropriate marketing plans’. According to Järvinen and Karjaluoto (2015), they emphasize the importance of strategic information (e.g., brand loyalty and customer satisfaction) to top management and the importance of support from top management to the successful deployment of marketing performance data. Adams et al. (2019) find that technology enhances

Table 2. Classification of accepted articles.

Category	Factor	Impact Area			Source
		Organizational	Individual	Environmental	
Management Support	Increase employees' knowledge	✓	✓		Leonidou et al., 2011; Kamboj & Rahman, 2015.
	Information sharing	✓	✓		Gray et al., 2002; Changa et al., 2010; O'Cass & Weerawardena, 2010; Trainor et al., 2013; Heirati et al., 2013; Baye et al., 2016; Zhao & Priporas, 2017.
	Information quality	✓	✓		Good et al., 2000; Wade & Hulland, 2004; Stone et al., 2007; Changa et al., 2010; Zhao & Priporas, 2017; Aksu et al., 2018.
	Marketing management	✓			Gallivan & Depledge, 2003; O'Cass & Weerawardena, 2010; Kamboj & Rahman, 2015; Chae et al., 2014; Järvinen & Karjaluoto, 2015; Josephson et al., 2019; Rust, 2020; Adams et al., 2019.
	Sustainability	✓	✓	✓	Mariadoss et al., 2011; Goyal et al., 2013; Kamboj & Rahman, 2015.
Computer Staff Support	Problem solving	✓			Noh & Fitzsimmons, 1999; Järvinen & Karjaluoto, 2015; Zhao & Priporas, 2017.
	Reduce time	✓			Baye et al., 2016.
	Information exchange	✓	✓		Sambamurthy et al., 2003; Wade & Hulland, 2004; Sambamurthy & Subramani, 2005; Changa et al., 2010; Yu, 2011; Tafti et al., 2013; Lioukas et al., 2016.
Ease of System Use	Building customer database	✓	✓		Noh & Fitzsimmons, 1999; Changa et al., 2010.
	Easy to learn	✓	✓		Good et al., 2000; Stone et al., 2007.
	Integration of marketing activities	✓	✓		Gray et al., 2002.
Individual Performance	Employee satisfaction	✓	✓		Good et al., 2000; Leonidou et al., 2011; Kamboj & Rahman, 2015.
	Improve quality	✓	✓		Chang et al., 2010; Yu, 2011; Angulo-Ruiz et al., 2014; Baye et al., 2016.
	Increase productivity	✓	✓		Hendricks et al., 2007; Blesa & Ripolles, 2008; Changa et al., 2010.
	Marketing skills development	✓	✓		Kaleka, 2011; Shou et al., 2012; Germann et al., 2013.
	Skills to segment and target markets	✓	✓		Bharadwaj, 2000; Gustafsson et al., 2005; Ruiz-Ortega & García-Villaverde, 2008; Goyal et al., 2013; Saunila et al., 2014.
Firm Performance	Increase competition	✓			Bharadwaj, 2000; Craig & Douglas, 2001; Gray et al., 2002; Matear et al., 2004; Gustafsson et al., 2005; Wu et al., 2006; Brodie

(continued)

Table 2. Continued.

Category	Factor	Impact Area			Source
		Organizational	Individual	Environmental	
	More profitable	✓			et al., 2007; Ruiz-Ortega & García-Villaverde, 2008; Goyal et al., 2013; Siahtiri et al., 2014; Murmann et al., 2015; Kamp & Parry, 2017; Grover et al., 2018. Dutta et al., 1999; Brush & Artz, 1999; Fahy et al., 2000; Gray et al., 2002; Matear et al., 2004; De Sarbo et al., 2005; Eng & Spickett-Jones, 2009; Leonidou et al., 2011; McLean & Antony, 2014; Gregory et al., 2017.
	Industry leader Promotion	✓			Good et al., 2000. Lisboa et al., 2011; Kaleka, 2011; Shou et al., 2012; Kemper et al., 2013; Su et al., 2013.
	Marketing plans	✓			Noh & Fitzsimmons, 1999; Slotegraaf & Dickson, 2004; Ethiraj et al., 2005); Krasnikov & Jayachandran, 2008; O'Cass & Weerawardena, 2010; O'Cass & Ngo, 2011; Järvinen & Karjaluo, 2015.
	Distribution channels	✓		✓	Moore & Fairhurst, 2003; Prahalad & Ramaswamy, 2004; Ratnatunga & Ewing, 2005; Hooley et al., 2005; Jean et al., 2008; Morgan et al., 2009; Krush et al., 2013; Siahtiri et al., 2014; Hadjimarcou et al., 2015; Jensen et al., 2017; Gregory et al., 2017.
	Price	✓			Brush & Artz, 1999; Noh & Fitzsimmons, 1999; Chang et al., 2010; Kaleka, 2011; Ngo & O'Cass, 2012; O'Cass et al., 2012; Kaleka, 2012; Perez-Cabanero et al., 2012; Kemper et al., 2013; Goyal et al., 2013; Martínez-López & Casillas, 2013; Kamp & Parry, 2017.
	Financial goals	✓			Moorman & Slotegraaf, 1999; O'Cass & Weerawardena, 2010; Järvinen & Karjaluo, 2015.
	Effectiveness of advertising	✓			Song et al., 2005; Gustafsson et al., 2005; Guenzi & Troilo, 2007; Song et al., 2007; Jean et al., 2008; Kemper et al., 2013; Aksu et al., 2018.
	Business strategy	✓			Berthon et al., 1999; Noh & Fitzsimmons, 1999; Cragg et al., 2002; Bergeron et al., 2004; Kamboj & Rahman, 2015; Järvinen & Karjaluo, 2015; Lioukas et al., 2016; Dyerson et al., 2016.
Customer Orientation	Customer value	✓	✓		Ngo & O'Cass, 2009; Nath et al., 2010; Kirca et al., 2011; Protogerou et al., 2012; Kemper et al., 2013; Rust &

(continued)

Table 2. Continued.

Category	Factor	Impact Area			Source
		Organizational	Individual	Environmental	
	Customer satisfaction	✓			Huang, 2014; Grover et al., 2018; Good et al., 2000; Fahy et al., 2000; Gray et al., 2002; Moore & Fairhurst, 2003; Orr et al., 2011; Trainora et al., 2011; Ripolles & Blesa, 2012; Chen, 2012; Trainor et al., 2013; McLean & Antony, 2014; Shams et al., 2015; Wang & Kim, 2017.
	Customer retention	✓	✓	✓	Appiah-Adu et al., 2001; Matear et al., 2004; Ruiz-Ortega & García-Villaverde, 2008; Kemper et al., 2013; Nath et al., 2010; Trainora et al., 2011; O’Cass & Sok, 2012; Su et al., 2013.
	Customer knowledge	✓	✓		Gustafsson et al., 2005; Ruiz-Ortega & García-Villaverde, 2008; Goyal et al., 2013; Siahtiri et al., 2014.
	Customer relationship	✓	✓		Ngo & O’Cass, 2009; Lisboa et al., 2011; Merrilees et al., 2011; Siahtiri et al., 2014; Zhao & Priporas, 2017; Rust, 2020.

Source: Author’s own.

marketing management and increases market performance, and Baye et al. (2016) show how customer traffic can be improved based on website quality.

Based on an extensive SR, Goyal et al. (2013, p. 370) note that ‘*despite lots of rigorous efforts, the association between corporate sustainability performance and firm performance is still not well understood*’. Also, Mariadoss et al. (2011) argue, based on 47 case studies, that competitive advantage shall be based on significant ‘contribution to a sustainable economic activity’. In similar lines, Goyal et al. (2013) emphasize the necessity of analyzing the influence of sustainability performance on customer value creation.

4.2. Computer staff support

Computer staff support is linked to increased productivity. Zhao and Priporas (2017) in their study note that ‘IT-enabled information exchanges between functions or firms allow a more “real-time” and more detailed understanding of individual actions’. IT systems can effectively enhance firm performance by mitigating deficiencies in information processing (Järvinen & Karjaluoto, 2015). IT systems allow data to be processed in real-time, affecting the ability to influence customer behaviour in highly competitive markets, like e-tailing (Baye et al., 2016). There is a broad body of research on marketing capabilities (Kaleka & Morgan, 2019). However, the studies mainly concentrate on disembodied marketing functions (e.g., ‘product development capability’). To this end, Trainor et al. (2011) promote an integrative approach to technology, including human and business resources for improved e-Marketing capabilities. Germann et al. (2013) note that marketing analysts should provide marketing

executives with insights to develop viable marketing strategies. Harrison and Hair (2017) emphasize the importance of customer support in direct selling and argue that direct channel technology facilitates firm outreach to customers.

4.3. Ease of system use

According to the research conducted by Nöjd et al. (2020), digital technology overlaps between customers and service providers and investigates technological keenness and averseness. Integration of marketing activities is mostly emphasized using data (Gray et al., 2002) and analytics (Trainor et al., 2014). In addition, Germann et al. (2013) suggest that ease of system use may be the main driving force in achieving a firm-wide analytical culture. Importantly, the studies included in the current review draw conclusions from executives and top management (O’Cass & Trainor et al., 2011; Germann et al., 2013), whereas the actual users of IT systems are lower on the firm ladder. For example, Harrison and Hair (2007, p. 42) note that it is ‘*necessary for salespeople to leverage IT to flexibly manage customer relationships*’. Thus, an investigation of ease of system use on a more operational level (in juxtaposition to the managerial perspective) would provide more insights into the interplay of system use, individual performance, and firm performance.

4.4. Individual performance

Previous research shows how customer traffic can be improved based on website quality (Baye et al., 2016). Trainor et al. (2011) show how e-Marketing enables employees to focus on customers by sharing information within an organization. Germann et al. (2013) emphasize the importance of developing marketing analytics skills to improve firm performance and posit that these skills are a source of competitive advantage. A considerable body of research investigates marketing capabilities (Kaleka & Morgan, 2019), but much less has been investigated with respect to particular skills of marketing employees. This gap is surprising in comparison to the numerous contributions in the sales domain (Ahearne & Rapp, 2010). Further, numerous studies are based on data collected from top management (Trainor et al. 2014). O’Cass and Weerawardena (2010) find that managers drive market learning and marketing capabilities in response to challenging environments. Trainor et al. (2011) later extends this with respect to e-Marketing. According to Gregory et al. (2017), they show e-commerce marketing capabilities affect export venture performance. They note that roughly 20% of the performance variance is explained by the efficiency of two elements (distribution and communication) of the basic marketing mix. However, the studies included in the current review do not investigate technology as it relates to performance on an individual level.

4.5. Firm performance

The firm performance category is well-established. Järvinen and Karjaluoto (2015) show how marketers can extract financial outcomes and clearly demonstrate

marketing contribution to top management. They also prove that web metrics stem from strategy and drive strategy. Also, show how web metrics can allow for better control of marketing plans. Germann et al. (2013) provide broad evidence to support the influence of an analytics culture on firm performance. Interestingly, Mariadoss et al. (2011) note that marketing capabilities can be drivers of technical innovations, and Hadjimarcou et al. (2015) point out the facilitating role of IT in international market alliances. O’Cass and Weerawardena (2010) find that marketing capabilities influence brand performance, and Trainor et al. (2011) extend this finding by providing evidence for e-Marketing capabilities. Lioukas et al. (2016) note that IT capability positively affects firm performance and customer service. However, Hadjimarcou et al. (2015) argue that IT capabilities have an indirect effect on performance through inter-firm relationships. Gregory et al. (2017) show that e-commerce marketing capabilities positively affect export venture performance. They further note that companies can better align with markets by leveraging new technologies. In their extensive, cross-sector study, Eggers et al. (2017) show that the use of social media technology does not have a direct effect on firm performance for small and medium-sized enterprises. They argue that the direct effect is significant for larger companies, mainly in manufacturing and business-to-business markets. In contrast, Chae et al. (2014) find no evidence to support the positive influence of IT capabilities on superior performance.

4.6. Customer orientation

Considering the provenance of the review, the customer orientation category seems to be not obvious. Trainor et al. (2014) show the effects of customer-centric management on customer relationship performance. O’Cass and Weerawardena (2010, p. 10) provide evidence to support the importance of customer knowledge and relationships (‘market sensing’ and ‘customer linking’) in competitive strategies. Zhao and Priporas (2017) emphasize the benefits of technology for upstream marketing outcomes, mainly through better connection with customers. Trainor et al. (2014) provide evidence for the impact of social media technology on relationship management. Wang and Kim (2017) show that social media usage moderates the influence of social customer relationship management on firm performance. We note that 22 studies in this review discuss social media. However, we have not identified contributions discussing the impact of artificial intelligence or machine learning technologies on customer orientation. O’Cass and Weerawardena (2010) note that a competitive environment drives the shift of strategic resources to solutions that enable better understanding of external forces (customers and competitors). Similarly, Trainor et al. (2011) underline the profound influence of the competitive environment on e-Marketing capabilities. Lioukas et al. (2016) note that IT capability positively affects customer service. Indeed, Hadjimarcou et al. (2015) posit that IT capabilities enhance inter-firm relationships. Eggers et al. (2017) show that responsive market orientation positively affects firm performance in small and medium-sized enterprises. Harrison and Hair (2017) show that the use of technology has a strong positive effect on consumers’ perceived relationship quality and CRM performance. Across the categories in this

review, Goyal et al. (2013) suggest that commitment to sustainability is crucial considering the competitive pressures; they consider sustainability to be an important factor in customer value perception.

5. Research propositions

As the development and application of advanced technologies covers a wide range of areas, future research directions can be diverse. To maximize the benefits of using advanced technologies for decision-making in marketing, three research propositions are offered based on the organizational, individual, and environmental impact of technological innovation. The SR is strongly grounded in the classification framework that focuses on organizational, individual and environmental impact of advanced technology. Therefore, these three elements flow out of the SR into the relevant research propositions section for each element. Thus, the propositions are related to the flow of the argument from the review to the future focus of the research.

5.1.1. *Impact of technology on organization*

Technological advancements have been driving business changes since the humble beginnings of e-mail communication in 1978 and the World Wide Web in 1989. More recently, digital transformation and digital enablement have become hot topics in business strategy (Järvinen & Karjaluoto, 2015). Thanks to the increasing ease of exchanging information and building customer databases, marketing has become more quantitative (Aksu et al., 2018). In parallel, the influx of data science in marketing has helped it become more accountable (Järvinen & Karjaluoto, 2015). As machine learning and artificial intelligence (AIML) proliferate in marketing practices (Huang & Rust, 2018), marketing departments have seen increased efficiency (Rust, 2020). These trends have increased information quality and positively influenced marketing management (Josephson et al., 2019; Rust, 2020) as well as firm performance (Gregory et al., 2017). Technological advances have boosted the marketing mix of companies and improved the effectiveness of promotion (Aksu et al., 2018), distribution channels (Jensen et al., 2017), and introduced smarter pricing (Kamp & Parry, 2017).

The orientation on technological advancements driven only by improvements in efficiency is likely to negatively impact long-term performance. Over-reliance on technology brings two imminent risks. The first is related to additional stress and strain on people working in sales and marketing (Huang & Rust, 2018). The second risk is related to detachment from customers. Recent research shows a digital mismatch between organizations and customers. While a selling organization puts more emphasis on technology-based cooperation with customers, customers may not be similarly willing to change the mode of cooperation. In a broader sense, more research is needed to investigate how technology can improve value co-creation (Grover et al., 2018) as well as strengthen and broaden customer relationships. Ultimately, technology should provide opportunities to manage customer retention beyond churn combating programs and towards more strategic approaches to customer relationships (Zhao & Priporas, 2017). However, the main competitive

advantage may stem from the new dimension of sustainability. As technology is putting increasing pressure on human resources in terms of speed, efficiency, and round-the-clock availability, the way humans and technology interact may change.

Proposition 1a: *Competitive advantage will be defined by a novel type of strategic resource at the intersection of technology and human activity.*

Proposition 1b: *The ability to create and sustain emotionally balanced cooperation between humans and technology on both intra- and inter-organizational levels will drive the market position of companies.*

5.1.2. Impact of technology on individuals

Technology has a profound impact on marketing from an individual's perspective, particularly in terms of skills development (Germann et al., 2013). However, cloud technologies, such as software as a service (SaaS), have brought creative industries closer to the public, enabling customers to become creators. The technology used to create advertising content, previously restricted to specialized graphic studios, and has become available to a wider array of often self-made designers. The commoditization of new skills (which actually spans beyond marketing itself) has increased the pressure on sales and marketing professionals to continue learning. While continuous learning is a positive orientation, the question remains how it should be incorporated into the professional workload and aligned with work-life balance. These aspects are crucial since they are closely connected with burnout and, thus, carry the risk of negatively affecting firm performance (Angulo-Ruiz et al., 2014).

Although we have recognized big data and AIML as technological propellers of organizational performance, as a word of caution, these catalysts of growth come at a cost. Reliance on data shifts cognitive abilities towards algorithmic thinking and can possibly de-humanize relationships. A numerical representation of a customer is not equal to a customer herself; rather, it is a more (e.g., what was viewed or liked online) or less (e.g., what was paid for and for how much) abstract representation of an individual's behaviours. From this discussion, the important questions concerning the impact of technology on individuals are: For marketing professionals, is there a need for marketing departments as such, or should companies create a customer department instead? If so, does role ambiguity in marketing affect marketing performance?

Proposition 2a: *The key focus of business strategy will be on customer experience.*

Proposition 2b: *Technology will embrace emotions to deliver prolific and lasting experiences.*

5.1.3. Impact of technology on the environment

Researchers have claimed that technology will lower the human burden on the environment (Kamboj & Rahman, 2015). As such, it can be argued that digitalization may directly lower the footprint. However, there are concerns that energy consumption might increase due to technological advancements. Despite the disputes as to the impact of technology on the environment, a broader concept—sustainability - has received considerable attention in business practice, academia, and to a lesser extent,

the general public (Mariadoss et al., 2011). The term ‘sustainability’ has a systemic frame of reference. It binds together individuals, economy (production and consumption), and technology, proposing the preservation of all the elements of the system. Technology can help in increasing the level of customer consciousness regarding sustainability and in reinforcing the implementation of sustainable solutions. To this end, the impact of technology on the environment remains a blind spot in our SR. The literature concentrates more on functional environments, such as business, information services or international trade environments, than on a holistic understanding of the environment (Rust, 2020). As such, notions like ‘firm performance’, ‘employee satisfaction’ and ‘customer retention’ do not exist in a void but are rather immersed in a shared meta-environment. The terms ‘sustainability’ and ‘environment’ may be different, but they have a lot in common. The research covers the impact of technology on the marketing sector from the organisational, individual and environmental perspectives; and in this regard, the environmental element touches on, but is not limited to sustainability.

The environmental attitudes of consumers do not necessarily translate into purchase behaviour for sustainable products (Kennedy, 2010). Recent research developments in this area suggest a need for coordination in offering sustainable value to customers with proper corporate social responsibility (CSR) strategies. From an applied perspective, there is a growing body of research on CSR (Kamboj & Rahman, 2015). However, despite the important claims of CSR, it has been criticized for having a rather inward orientation (Verhoef et al., 2020). The role of technology would be, thus, to leverage information sharing between a firm and its customers (Zhao & Priporas, 2017) and to allow companies to become more profitable through knowledge gained (Leonidou et al., 2011). We believe that the future is happening now.

Proposition 3a: *Technology will facilitate the generation and sharing of knowledge in increasingly egalitarian ways.*

Proposition 3b: *Based on this knowledge of technology, companies and customers will co-create increasingly sustainable value.*

6. Research implications and future directions

This study explored different applications of advanced technologies along with their impact on the performance of marketing, which will facilitate conceptualizing the impact of technological innovation on marketing in future studies. These recommendations are organized based on the three main areas, the impact of technology on organizations, individuals, and the environment.

6.1. Impact of technology on organizations

Most of the current research is focused on the impact of advanced technology on firm performance. Moreover, all the categories of the classification framework are mainly addressed from the organizational perspective, focusing on specific marketing activities, such as developing marketing plans (Järvinen & Karjaluoto, 2015), elements of marketing-mix: promotion (Kemper et al., 2013), distribution channels (Gregory

et al., 2017), price (Kamp & Parry, 2017), or effectiveness of marketing activities: effectiveness of advertising (Aksu et al., 2018), etc. Therefore, there is a need for more comprehensive studies that focus on the impact of the advances in technology on integrated business activities. In the reviewed studies, authors are focused mainly on measuring the impact of technological innovation on marketing activities in reference to organizational performance. In their study, Kamboj and Rahman (2015) propose that the mediating role of marketing capabilities on firm performance should be pursued further. Similarly, we believe that further research is required to investigate whether marketing mediates the impact of technological innovation on performance.

Also, it is observed that in terms of business strategy, the studies focus on assessing the technology adoption readiness for small companies (Dyerson et al., 2016), analyzing the role of metrics to drive strategy (Järvinen & Karjaluoto, 2015), the role of analytics in firm performance (Germann et al., 2013), customer experience and loyalty programs (Galletta et al., 2018) and new business models (Ng & Wakenshaw, 2017). In order to increase the impact of technological innovation on marketing and organization performance, it is important to align marketing strategies with innovation strategies. These innovation strategies are what future studies should focus on and should integrate conceptual frameworks and technology adoption models at an intra-organizational level, using novel types of strategic resources. Under the pressure of the competitive markets, companies are prone to rely on advanced technologies that affect marketing practices (Huang & Rust, 2018) by increasing marketing departments' efficiency (Rust, 2020). On the other hand, this heavy reliance on the technology leads to excess stress and strain on employees (Huang & Rust, 2018) and customer detachment. To avoid this, it is vital to create and sustain emotionally balanced cooperation between humans and technology on both intra and inter-organizational levels. Thus, future research should focus on improving value co-creation and strategic approaches to customer relationships.

On the other side, Yadav and Pavlou (2020) argue that human-oriented interactions play an important role even in highly automated environments (e.g., a salesperson interacting with consumers during a store visit). It will be interesting to investigate also, how these interactions (customer-firm, firm-customer, inter-customer, and inter-firm) will take place and the technologies to be used for this purpose.

6.2. Impact of technology on individuals

It is widely recognized that technology has improved the customer experience and customer loyalty programs through big data and data analytics (Galletta et al., 2018); customer data are used to personalize products (Ng & Wakenshaw, 2017) and provide personalized and reality augmented services (Vermesan et al., 2011). According to Zhao et al. (2012), the AI algorithm's ability to predict really new products is still an open research area. Therefore, future studies may focus on how advanced technologies will be used to propose really new products and services to meet customer needs and wants.

Meanwhile, Grewal et al. (2020) argue that along with the produced benefits (e.g., access to big data, improved customer experience management), technologies trigger

concerns related to information security and potential privacy risks. Since, privacy is related to the consumer's trust and firm performance (Martin, 2018), it's very important that future studies focus on analyzing the factors that impact the consumer's trust on technological innovation. How can we improve the customer experience so that they can accept losing some data privacy in exchange for the gained benefits? How do the customer's personal attributes affect the trust in the application of advanced technologies in marketing?

As discussed earlier, there are many studies investigating the role of the marketing capabilities (Kaleka & Morgan, 2019), but only a few studies focus on analyzing the particular skills of marketing employees in the light of highly automated environments. Studies related to marketing skills development and skills to segment and target market date back as far as 2014. Therefore, new studies should focus on: What should be the new skills of the marketing employees? What is the impact of these skills on employee well-being and the firm's performance? How should the marketing employee's continuous learning be stimulated and incorporated into the professional workload?

Thus far, technology and humans have been described from a rivalry perspective (Huang & Rust, 2018) or at least as two separate entities. We argue that a new, integrative (holistic) and evolutionary perspective is needed to investigate technology in marketing and beyond. Technology did not emanate from nature; rather it is our own creation. Thus, the juxtaposition is misleading. Technology has surpassed the stage of being merely a tool and is becoming a part of ourselves. This trend is not yet reflected in the literature.

We believe that the intertwining of technology and humans will be the most important topic of scholarly discussion in the coming years. This is evidenced in special issues of journals, like the Journal of Personal Selling & Sales Management (The human side of digital transformation in sales), and conferences like AMA Winter 2021: The Human Side of Marketing in the Age of Digital Transformation.

6.3. Impact of technology on environment

One of the most striking outcomes of the current review is that there is a limited pool of studies related to the impact of technology on the environment. Möller et al. (2020) argue that marketing research is losing its relevance by viewing the business environments as simplistic 'markets' and concentrating on dyadic business relationships and their management rather than ecosystem analysis and orchestration. Thus, future research needs to focus on the impact of technology on individual-organization-environment relationships, on creating sustainable value for all the actors involved. We would expect more integrative approaches of individual-organization-environment relationships with the inclusion of technology. Further, it would be important to verify if and how the use of advanced technology in marketing practice affects customer value and customer retention.

So far, the focus of the research studies is on the impact of technological innovation on the individual and the organization, positioning the last ones in a reactive perspective. We believe that in order to achieve the full potential of the technology in

the future, it is important that individuals and organizations take a proactive approach against technology. Future research should focus on how the new technology should look like, from the perspective of the individuals and organizations that will use them? What should be the additional capabilities of existing technology (such as: AI, IoT, Big Data, etc.)?

As mentioned earlier, the use of advanced technologies may cause intermediary effects such as information security and potential privacy risks. According to Grewal et al. (2020), these effects of technology influence customer satisfaction/loyalty, employee well-being, firm profitability, and the ecosystem in which the marketing activities are conducted. As a result, future studies should focus on analysing the impact of government regulations related to the use of advanced technologies in marketing, as these will affect the organization's performance. What are the liabilities of all the actors who communicate through the means of the advanced technologies?

We believe that an inclusive environment where all the actors contribute and are liable for their actions will stimulate knowledge sharing and co-create sustainable value for all.

7. Research limitations

This study has certain limitations. It should be noted that research on the fundamental impact of technological innovation was introduced in different sectors about a decade ago. The initial interest in early technologies was largely limited to the computer science arena, for which technology represented a new arrangement of long-term, pre-existing computer science theory. Several years passed before other industry and academic communities began to consider the concept of advanced technologies. Since then, much interest has been generated, but research topics are still scattered, and research approaches are still maturing, many of which lack rigor. The emergence of articles on the impact of technological innovation in the marketing sector in leading academic journals has substantially lagged industry adoption.

Further, through a SR, we can ascertain, assess, understand, and produce the available research, and reach logical conclusions based on the findings of the review. Within this approach, this paper has adapted the three-phase protocol of Kitchenham and Charters (2007) and Ali et al. (2018; 2020, 2021). This SR approach certainly adds value to a discipline/sector discussion. The current research considered only peer-reviewed journals, with the additional inclusion of the criteria described earlier. However, since we used a well proven methodology for shortlisting the studies for this review, the impact of this filtering of articles is expected to be less. Like many other literature reviews, we also attempted to be more systematic during the selection of studies. Furthermore, the selection of articles in this study was confined to full-text articles available in the selected databases. Only English-language articles were available, which leads to an exclusion bias against articles written in other languages. Our adapted approach is also limited in that the publishing journals of review papers were not classified. The addition of this information would add depth to the value contributed by this SR. Table 3 summarizes directions for further research stemming from this study.

Table 3. Directions for further research.

Theme	Research Gaps	Future Research Focus
Impact of technological innovation on organizations	<ul style="list-style-type: none"> Most of the current research focuses on the impact of advanced technology on firm performance. 	<ul style="list-style-type: none"> Further research required on whether marketing mediates the impact of technological innovation on performance. Future research should also focus on improving value co-creation and strategic approaches to customer relationships.
Impact of technological innovation on individuals	<ul style="list-style-type: none"> AI algorithms' ability to predict new products is still an open research area. Many studies have investigated the role of the marketing capabilities. 	<ul style="list-style-type: none"> Future studies may focus on how advanced technologies will be used to propose new products and services to meet customer needs and wants. The intertwining of technology and humans should be an important topic of scholarly discussion in the coming years. Investigating how human-machine co-existence influences human-to-human interactions and relationships should also be addressed in future research.
Impact of technological innovation on environment	<ul style="list-style-type: none"> Limited pool of studies related to the impact of technology on the environment. 	<ul style="list-style-type: none"> Future research needs to focus on the impact of technology on individual-organization-environment relationships, on creating sustainable value for all the actors involved. A more integrative approach is advocated. Further, it is important to verify if and how the use of advanced technology in marketing practice affects customer value and customer retention.

Source: Author's own.

8. Conclusion

There is a huge pool of research that addresses the impact of technological innovation in the marketing sector. Most of the publications focus on the impact that these technologies have on firm performance within marketing. To broaden the view of the impact of technological innovation on the marketing sector, a classification framework is proposed consisting of three directions, specifically the organizational, individual, and environmental impact. While utilizing advanced technology improves a firm's efficiency, it may also lead to excess stress and strain on people working in sales and marketing, as well as customer detachment. To avoid this, it is vital to create and sustain emotionally balanced cooperation between humans and technology on both intra and inter-organizational levels. Thus, future research should focus on improving value co-creation and strategic approaches to customer relationships.

One of the most obvious outcomes of the SR is noting the limited research on the impact of technology on the environment. Thus, future research needs to focus on the impact of technology on customer - firm - environment relationships, on creating sustainable value for customers, and on customer retention. The research also calls

for further analysis of emerging IT to develop a stronger understanding of the impact of specific technologies within specific frameworks. Investigating how human-machine co-existence influences human-to-human interactions and relationships should also be addressed in future research.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Omar Ali  <http://orcid.org/0000-0001-5386-8100>

Yogesh K. Dwivedi  <http://orcid.org/0000-0002-5547-9990>

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