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Artificial intelligence and the shaping of the business context

The automation of physical labor resulted in the Industrial Revolution over one hundred fifty years ago. Today, the automation of work typically performed by the human mind is promising another quantum leap forward (Huang and Rust, 2018; Wirtz et al. 2018; Davenport et al., 2020; Mariani et al. 2021; Mustak et al. 2021), propelled by digital technologies in general and by artificial intelligence (AI) in particular.

The advent of AI has necessitated rethinking our understanding of the contexts and practices of value co-creation, increasingly characterized by a progressively wider set of multi-level interactions among more and more stakeholders (e.g., Kohtamäki and Rajala, 2016; Ramaswamy and Ozcan, 2018; Vargo and Lusch 2017). On one hand, the scope and scale of interaction have become enlarged and the boundaries between contexts more blurred; on the other hand, the pace of interaction has increased dramatically (Corsaro and Anzivino, 2021). This points to the need for academics and practitioners alike to rethink the relationships among firms, customers, and other actors in value co-creating service ecosystems (Vargo et al., 2020; Bharadwaj and Shipley, 2020; Singh et al., 2019). Generally, AI is more than just a change in the technological environment, with implications for human-machine interactions; it also has far-reaching implications for business and social relations, and for new emerging business models—thus the title of this special issue: “Artificial Intelligence and the shaping of the business context.”

It would be great if we had forward-looking spectacles to see the changes that lie ahead, but we do not. Nevertheless, as with every technological wave, it is legitimate to consider the possibilities, even as awareness of them proliferates. What we can be sure of is that AI applications promise to revolutionize how people work and live (Huang et al., 2019), even if it is too early to say which of them will become mainstream, and particularly in which contexts and businesses. The contributions to this special issue should be seen as part of the early process of speculating about likely issues related to AI in business.

Even as this special issue was being conceived and developed, AI, and what we know about it, was progressing. What is becoming clear is that, based on its ability to process more ecosystem information, AI is (1) enhancing some business and marketing processes; (2) leading to the reconfiguration and shaping of existing ecosystems and the formation of new ones, through the integration and sharing of more data; and (3) leading to more real-time interactions and the possibility of developing a more systemic market vision.

However, AI has also led to the identification of a number of naïve assumptions and unanticipated issues. The primary assumption was thinking that investing in AI would necessarily lead to benefits in most, if not all, cases (e.g., creating intelligent chatbots or enhancing social CRM through AI). In fact, many investments in AI have not generated the

expected increases in value at all. The real problem has not been with investment in and application of the technology per se but with the lack of simultaneous, necessary investment in the rest of the ecosystem in which it is employed. Seeing this and similar problems requires zooming out to increasingly higher levels of aggregation (e.g., micro, macro) to reveal increasingly encompassing ecosystems (Vargo and Lusch 2017)—in other words, the contexts.

For example, Loureiro et al. (this issue) mention some of the micro-level challenges that top managers must face in implementing AI. Within many organizations, AI has led to the transformation of many roles people held without really understanding their new roles. Examples can be found in banks that have seized opportunities to eliminate their branches by shifting to automation and AI. Consequently, many employees accustomed to performing traditional customer support activities have found themselves thrust into more challenging roles for which they were unprepared. In short, the cultural transition that was needed to accommodate technological transition was missing. Similar micro-level observations can be made in relation to customers.

If the potential of AI is to be realized, organizations must understand, consider, and engage their customers and employees in the reshaping of the whole value co-creating process. As Mele et al. (this issue) contend, the use of AI technologies cannot produce any outcomes by themselves but can enable the design of conditions and contexts that promote intelligent behaviors and amplify capacities for self-understanding, control, and action. Organizations can be assisted through more fully unleashing the expanded analytical capabilities and knowledge that big data and AI make available (see, e.g., Galic and Ghasemaghie, Zhang et al., and Zu et al., this issue). This point highlights again how AI is linked to a concept of context that goes far beyond business aspects, involving cultural and social contexts.

Observed from a more macro (i.e., societal) level, the implementation of AI raises profound ethical issues (Etzioni and Etzioni, 2017). For example, Bostrom and Yudowsky (2014) emphasized three important ethical considerations: transparency, reliability, and fairness. It also raises more general issues of ethics and sustainability (see Du and Xie and Murtarelli et al., this issue). Embracing these AI-related, ethical challenges can provide organizations the necessary insights and afford them competencies for developing effective, long-term value co-creation processes between the company and the principal actors, including employees and customers (see Leone et al., Lalicic and Weismayer, and Perez-Vega et al., this issue), as well as other societal stakeholders (De Carlo et al., this issue).

That is, technology is an operant resource—one capable of acting on other resources to create value—and it performs a critical role in ecosystem (re)formation (Vargo et al., 2015). As service-dominant (S-D)

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logic informs us, all social and economic actors are affected by, and affect, their socio-material contexts (Lusch and Vargo, 2014; Orlikowski, 2007). This interplay between social and material actors can be understood through a perspective on technologies that consists of the (re) combination of meanings, processes, and practices (Akaka and Vargo, 2014; Mele and Russo Spena, 2019). In shaping and being shaped by the ecosystem, a wider contextual perspective that includes also the social, cultural, and situational dynamics of different contexts, in which value is created, should be considered (Akaka et al., 2015). For example, Scarpi et al. (this issue) highlight the social cues relevant to AI adoption and appreciation but show that companies do not yet understand the experiential value loss (and eventually the gain) in AI applications.

Considering human–machine interaction, the actor’s perspective is critical to value co-creation, but it is important to develop a deeper understanding of how this ability, as well as new forms of self-understanding and self-development, can be shaped by AI, through the enactment of cognitive, emotional, and social surroundings in the actor’s context. Once again, context is key, as only understanding the context will generate benefits: the real value of technology lies in its use within the interaction context. More generally, and perhaps somewhat paradoxically, it is important to understand that not only do business contexts shape AI applications; AI applications also shape contexts.

This special issue is intended to capture the complexity described above. In the following section, we highlight its content.

1. Papers in the special issue

Driven by exponential increases in data size and computing power, the advancement of AI generates massive amounts of data. This phenomenon, widely called *big data*, which refers to the integration of enormous amounts of diverse digitized sources of complex data structures (O’Leary and Daniel, 2013). The use of big data by companies has increased in recent years. Big data drives value creation through the data generated by trading partners in upstream, downstream, and horizontal collaboration to investigate opportunities (Barbosa et al., 2018). The paper “A bibliometric review of a decade of research: Big data in business research—Setting a research agenda,” by Yucheng Zhang, Meng Zhang, Jing Li, Guangjian Liu, Miles M. Yang, and Siqi Liu, shows that, everywhere, big data and AI interplay: big data is the product of AI, and the advancement of big data also promotes AI’s development. The authors report that big data has disrupted board-level decision-making by alleviating board members’ cognitive biases, improving their adaptive response to market occurrence. The authors also show a rapid increase in the number of studies over the last 10 years, largely due to the amount of data generated from and applied to business units, governments, and scientific research. Even though big data is becoming popular in recent years, much research remains practice-driven, and academic-related research remains in its early stages.

Furthermore, while the contributions of information management and operations research and management are growing, the fields of marketing and general management show a decline. This perhaps indicates that upstream improvements, in manufacturing and internal processes are often successful that downstream, in customer interfaces, improvements are more limited. As data gathering and analysis becomes a new frontier of competitive advantage, we may assist in improving the use of unstructured data (e.g., text, videos, and social media) and, perhaps, growing successful applications downstream.

Although themes like the societal and organizational impact of AI dominate the media environment (e.g., Pueyo, 2018; Holford, 2019; Rampersad, 2020; Robinson et al., 2020), Sandra Maria Correia Loureiro, João Guerreiro, and Iis Tussayadiah, in their paper “Artificial intelligence in business: State of the art and future research agenda,” find that governance is among the most relevant fields of study on AI. Their contribution testifies to recent ferment on the topic of AI, with an exponential growth of studies embracing different fields and business sectors in the last decade. AI is expected to lever human intelligence to

an unprecedented degree of analytic ability, revolutionizing businesses at every level, from the executive suite to the factory tier.

Empowering governance using AI-based algorithms poses major challenges to top management as they decide which areas to prioritize and to what extent of delegation. Such consideration is extremely timely as it is, eschewing the downturns of current political debates in which governments of major countries may begin delegating to algorithms the zoning of lockdowns during the Covid-19 pandemic (Carey, 2020; Punn et al., 2020). This area will likely open intriguing avenues of research, such as algorithm-based management and the social construction of decision algorithms. Because AI begins with simple data collection and data integration technology, data lie at the very foundation of all intelligent systems and can be defined as the empirical foundation of AI development.

The paper “Online Critical Review Classification in Response Strategy and Service Provider Rating: Algorithms from Heuristic Processing, Sentiment Analysis to Deep Learning,” by Jianjun Zhu, Yung-Chun Chang, Chih-Hao Ku, Stella Yiyan Li, and Chi-JenChen, identifies and tests the most critical customer reviews that companies must face and prioritize in order to improve their online strategies, also using AI to overcome the multitude of problems brought by the processing of information. The authors classify critical reviews using 12 algorithms in the service industry and 3 information-searching approaches: Heuristic Processing, Linguistic Feature Analysis, and Deep Learning-based Natural Language Processing (NLP). They also conduct empirical analysis of 110,146 online reviews received by 43 hotels in a hospitality chain over 7 years, identifying 6 algorithms. The authors indicate how these algorithms can improve hotels’ response strategies and furnish recommendations for future actions. Apart from its empirical application, the paper enriches the literature in several ways: it enlarges the academic service marketing literature by deepening important aspects of response strategy—for example, how to identify and respond to critical reviews. It develops a mechanism for defining and identifying critical reviews to prioritize and respond to. It also offers a practical tool for firms to use in recognize critical aspects of online reviews, with the help of 12 algorithms. It gives managers insights into important ways to develop response strategies.

The paper “Smart Nudging: How cognitive technologies enable choice architectures for value co-creation,” by Cristina Mele, Tiziana Russo-Spena, MariaLuisa Marzullo and Andrea Ruggiero explores how AI and other forms of cognitive technology can influence value co-creation. According to nudge theory (Thaler and Sunstein, 2008), humans are heavily influenced by their environments, emotions, and social interactions. However, how value co-creation is driven by nudged choices in the process that affects agencies and practices remains under investigation. To understand how cognitive technologies can improve human decisions and the process of co-creation, the authors conduct an empirical exploration of 15 case studies from the perspectives of multiple actors (e.g., providers, users, partners) and provide insights into how cognitive technologies affect agencies, behaviors, and everyday practices.

The authors find that choice architectures and nudges affect value co-creation by widening resource accessibility dynamically, extending engagement, and augmenting human actors’ agency. The effects of nudging are significant at the ecosystem level, as they lead to a re-institutionalizing process that influences their agency and practices. At the managerial level, interaction and collaboration between humans and machines support the development of routine behaviors under shared value, creating new solutions with shared meanings and understanding, which then enables the application of problem-solving behaviors.

The paper “How does Artificial Intelligence enable and enhance Value Co-creation in Industrial Markets?,” by Daniele Leone, Francesco Schiavone, Francesco Appio and Benjamin Chiao explores how and what kinds of AI-based solutions can help companies co-create value in B2B contexts, in which AI can provide valuable insights such as customer/user and external-market knowledge (Paschen et al., 2019). AI also

enables the co-creation of value between industrial partners. Singh et al. (2019) discussed how B2B companies are increasingly using AI technologies to help create value from the perspective of salespeople, but in general the literature does not offer detailed analysis of how AI can influence value co-creation (Kaartemo and Helkkula, 2018; Martínez-López and Casillas, 2013; Marcos-Cuevas et al., 2016).

The authors explore the role of Pieces Technologies, a US healthcare firm that provides AI-based solutions to gather and interpret patient information in real time. They analyze how the application of various types of AI (i.e., mechanical, analytical, intuitive, empathetic) (Huang and Rust, 2018) supports providers and customers of digital services in achieving value co-creation via perceptive and/or responsive mechanisms (Lenka et al., 2017). The authors develop a conceptual framework that combines the characteristics of the different types of AI (Huang and Rust, 2018) with the value co-creation mechanisms and different types of market knowledge (Paschen et al., 2019). They offer a framework that follows two processes loops: the first connects technology service providers with customers of the healthcare industry through a perceptive and responsive mechanism; the second connects customers with patients.

Lidija Lalicic and Christian Weismayer's paper, "Consumers' reasons and perceived value co-creation of using artificial intelligence-enabled travel-service agents," presents and tests a structural model of value co-creation. Their model ultimately reflects the behavior of adoption of or resistance to an AI-enabled service interface. More specifically, the paper focuses on consumers' reasoning behind adopting AI-enabled travel service agents. It analyzes the relationships between context-specific reasons that influence consumers' perceptions of adopting innovative services in the travel service sector. Despite uncovering a process through which value co-creation occurs, the contribution has implications beyond this. In the model, consumers' values and reasoning for and against acceptance influence their perceived value co-creation and thus their intentions to adopt these new service encounters. Each sector will, of course, have its own specificities, but the scouting of consumers' reasoning will help marketers re-formulate and design experience strategies, and facilitate the process to trigger consumers' intent to use AI-enabled services. By reducing the level of negative perceptions, businesses can work toward a positive co-creation of value, nudging consumers' acceptance of innovative service encounters. Understanding the fears and skeptical attitudes surrounding the transition from human-human to human-machine interaction is crucial to increasing the acceptance of new service encounters and to retaining one's customers.

Although the paper refers only to the context of travel services, among its intriguing findings is that reasons against adoption tend to be dispositional (e.g., unwillingness to give up old structures or overcome barriers), whereas reasons for adoption tend to be situational (e.g., personalization, functionality, convenience). The study thus provides a set of practical implications for the design and managing of consumers' perceptions of AI-enabled service encounters, providing guidance to all situations where a company decides to replace operant resource employees with AI-enabled agents (i.e., chatbots). The results may help service companies understand how encounters should be designed to support customer learning and to enhance co-creation of value while searching for, in this case, a holiday service (e.g., hotel, flight, destination activities).

Artificial intelligence has also been studied as a modality for improving relationships with customers and creating engagement. So far, the theoretical contribution to the marketing literature by "integrating" AI and customer engagement is limited (MacInnis 2011, p. 138). The paper "Reshaping the contexts of online customer engagement behavior via artificial intelligence: a conceptual framework," by Rodrigo Perez-Vegaa, Valtteri Kaartemob, Cristiana R. Lagesa, Niloofar Borghei, and Razavia Jaakko Männistö, conceptualizes how AI systems can be used to improve online customer engagement behaviors. Even though consumers' involvement in online reviews is positively associated with

overall satisfaction (Zhao et al., 2019), recent research still shows that online commenting behaviors—in particular, the purpose, focus, and impacts of consumers' complaints on service—are complicated (Xu, 2020). For example, compared with offline channels, many brands experience a higher percentage of online customer complaints (Holloway and Beatty, 2003) in which unsatisfied customers seek to vent their unhappiness and frustration instead of obtaining solutions to existing problems (Mattila and Wirtz, 2004).

Online customer engagement refers to the behaviors of customers in an online space that occur because of their motivational drivers while having a firm or brand focus (Van Doorn et al., 2010). Digital technology has led to the automation of a firm's interaction with its customers. The authors build a conceptual framework using AI and considering the outcomes of solicited and firm-unsolicited online customer engagement behaviors. Using a metaphor, the authors compare systems that consider AI to organisms and then use Stimulus-Organism-Response theory to analyze many types of customer behaviors. This work further develops Kunz et al.'s (2017) typology of online customer engagement behavior—passive, collaborative, customer-initiated, and firm-initiated—by arguing that such behaviors can be either solicited (live and stored) or unsolicited by the organization, which determines whether the data exist on the company's databases or on third parties' online platforms.

But given that the design of human-computer interfaces is becoming central to the development of AI-enabled consumer applications, it is imperative to understand the inner mechanics of these interfaces. Gabriele Pizzi, Daniele Scarpi, and Eleonora Pantano's paper, "Artificial intelligence and the new forms of interaction: Who has the control when interacting with a chatbot?," presents a model that addresses two variables central to the design of AI-enabled consumer interfaces: anthropomorphism and initiation. They find that low anthropomorphism and system—rather than consumer—initiation increases reactance. However, through the mediation of perceived choice difficulty, a reactance-based negative emotional response transmutes into higher satisfaction. Their findings highlight both advantages and disadvantages of AI-enabled human-computer interaction and suggest a differential use of the investigated features. For instance, consumers may be segmented according to their attitudes and interfaces crafted so that they become encouraged by the use of anthropomorphic figures. Alternatively, AI interfaces could be designed as process assistants so that consumers would spontaneously engage with them.

Interesting, then, is the application of AI in the context of urban destinations by Manuela De Carlo, Guido Ferilli, Francesca D'Angella, and Massimo Buscema. Their paper, "Artificial intelligence to design collaborative strategy: an application to urban destinations," focuses on collaborative strategies, defined as institutional inter-organizational relationships based on joint decision-making processes with the scope to generate mutual benefits (D'Angella and Go, 2009; Evans, 2001; Gray, 1996). Qualitative and quantitative methods have been used to investigate this topic, including social network analysis, single and multiple case studies, cluster and factor analysis, regression methods, and mixed methods. The sample used by the authors includes eight European cities (Barcelona, Berlin, Brussels, London, Madrid, Milan, Paris, Rome) selected via 2 criteria: the destinations had to be included in the top 20 list created by important ranking-authority institutions (ICCA and UIA), and they had to appear in important international rankings in the field of business tourism. This study provides the innovative use of the Auto-CM method, which can be considered a deep non-supervised Artificial Neural Network (Buscema et al., 2018). The Auto-CM method, unlike classical algorithms or ANN methods, can offer additional information useful to defining target strategies, even in more contained data sets. Although the application of this system may vary in different industries, this paper focuses on the tourism sector. The study offers great advances to the academic literature on collaborative strategies in tourism, focusing on how such strategies are increased and who the key players are. This permits highlighting the priority areas of action, who the fundamental stakeholders are, and what level of

governance should be included in collaborative destination strategies. Further, this shows the correlation between tourism and urban and national public policies.

The last three papers in this Special Issue address the ethical and societal implications of AI. Most of the academic literature focuses on the relationship between big data and financial benefits, but there is little work on how big data utilization can influence social aspects (Nunan and Di Domenico, 2017). This is the starting point for the paper “Big Data for Social Benefits: Innovation as a Mediator of the Relationship,” by Goran Calic Sand Maryam Ghasemaghah, which investigates the relationship between characteristics and performance of big data to understand whether companies use big data to improve their social performance. Considering the current literature on AI (Howard and Borenstein, 2018; Ostrom et al., 2019; Tegmark, 2017) and the moral aspects of technology (Kroes and Verbeek, 2014; Wallach and Allen, 2008), the authors aim to delineate the ethical issues of AI-enabled products. It is true that big data can benefit a firm; moreover, according to the authors’ hypothesis, it is also useful for fulfilling social aims, as in the mechanism of corporate social performance (CSP). Specifically, the authors analyze how the use of big data in reference to CSP leads to a modification of business practices and to a change in internal and external organization for a hypothetical firm (Camison and Villar-López, 2014). To support their hypothesis, they survey 297 North American middle and senior managers who usually use big data in their companies. Their results confirm that the use of big data has a positive impact on CSP and that how companies use big data leads to organizational innovation, which affects three types of CSP (economic, ethical-legal, and philanthropic). Moreover, the research also provides a practical tool for firms. It offers a clear theory-based understanding of the influence of data on CSP, which becomes an instrument for managers to use data differently and more successfully for their companies.

The ethical aspects of AI from the customer’s perspective, are discussed in “Paradoxes of Artificial Intelligence in Consumer Markets: Ethical Challenges and Opportunities,” by Shuili Du and Chunyan Xie. The authors analyze the relationship between ethical issues and AI-enabled value creation systems and how firms can redesign the future of ethical AI in consideration of ethics and moral principles. To define the ethical challenges of and opportunities for AI in consumer markets, the authors analyze all aspects of AI systems that have direct implications for ethical issues. Empirically, they conduct a multi-level perspective analysis on ethical issues of AI-enabled products at the level of the commodity, of the consumer, and of the society. Second, they build a conceptual framework to consider the future of ethical AI and to stimulate future studies on AI-related CSR. The paper contributes to the nascent literature at the intersection of AI, business ethics, and CSR in several ways. First, drawing on research on the moral significance of technology (Kroes and Verbeek, 2014; Wallach and Allen, 2008), it adopts a multi-level socio-technical perspective on AI ethics to identify a series of prominent yet thorny AI-related issues at the product, consumer, and society levels (e.g., AI biases, ethical design, privacy, cybersecurity, unemployment, human autonomy, and well-being). This issue is relevant also for managerial practice, as it offers suggestions for how companies should tackle these challenges and how managers can use multi-level analysis of AI-related ethical issues and for identifying possible corporate initiatives to undertake.

In conformity with previous contribution, Grazia Murtarelli, Anne Gregory, and Stefania Romenti, in “A conversation-based perspective for shaping ethical human-machine interactions: The particular challenge of chatbots,” introduce a conversational perspective discussing the ethical challenges accompanying the objective advantages of using chatbots. If using AI-enabled agents (e.g., chatbots) provides support in managing customer service experiences, it also raises ethical issues, particularly related to the progressive automation of online conversational processes. The issue the authors raise is that because they display human conversational behavior, chatbots can be mistaken for human if their robotic nature is not disclosed. In this way, customers interact

believing they’re holding actual conversations, unaware not only of the information asymmetry they nurture but also of the chatbots’ analytical and predictive capacity which enables them to engage in effective persuasive conversations. Three possible ethical challenges ensue: information asymmetry; anthropomorphizing; and privacy. Because these AI-enabled agents are seen as organizational representatives by digital users, and their conversations are not true conversations but *para-conversations*, attention should be shifted from enhancing performance to legitimizing chatbots in this role. The authors recommend (1) that chatbots reveal their identity from the beginning of a *para-conversation*, (2) that the structure and goal of conversations be explicitly stated before the conversations begin, and (3) that rules concerning privacy be explicitly stated. These disclosures should, according to the authors, transform chatbot-based *para-conversations* into a collaborative act whereby machines and users cooperate to achieve a shared, understood aim.

The heterogeneity of contexts discussed in the above papers is clearly a sign of how debate around AI is multifaceted. Likewise, their implications touch on different disciplines, and many questions still need answers.

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