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Value cocreation and codestruction in artificial intelligence-enabled service interactions: literature review and research agenda

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Abstract

Purpose – The adoption of artificial intelligence (AI) in frontline service encounters is a growing phenomenon in service marketing, which can lead to positive and negative results. In this context, this paper aims to review the literature on value cocreation and codestruction in AI-enabled service interactions.

Design/methodology/approach – A systematic literature review was carried out using the PRISMA protocol. Data were retrieved from the Web of Science and Scopus databases, from which 48 articles were selected for review. Data analysis, presentation of results and the research agenda followed the theory, context, characteristics and methodology (TCCM) framework.

Findings – The review especially revealed that: publications on AI-enabled value cocreation and codestruction are in the early stages of development; few articles have addressed value codestruction, and the main research emphasis is on value cocreation; interactions between human actors and AI-enabled autonomous nonhuman actors are resulting in value cocreation or value codestruction, or both, and these phenomena are also likely to occur when AI replaces more than one human actor in the service encounter; and AI is considered an increasingly independent nonhuman actor that integrates resources and interacts with other actors, yet prudence is necessary for its adoption.

Originality/value – This review fills a gap by jointly exploring the value cocreation and codestruction in the context of AI, presents an overview of the issues discussed and provides a research agenda with directions for future studies.

Keywords Artificial intelligence, Systematic review, Value formation, Chatbot, Service Robot, Human-AI interaction

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Cocreación y codestrucción de valor en interacciones de servicio facilitadas por inteligencia artificial: Revisión de la literatura y agenda de investigación

Resumen

Objetivo – La adopción de la inteligencia artificial (IA) en los encuentros de servicio en primera línea es un fenómeno creciente en el marketing de servicios, que puede llevar a resultados positivos y negativos. En este contexto, el objetivo de este artículo es revisar la literatura sobre la cocreación y codestrucción de valor en las interacciones de servicio habilitadas por IA.

Diseño/metodología/enfoque – Se realizó una revisión sistemática de la literatura utilizando el protocolo PRISMA. Los datos se obtuvieron de las bases de datos Web of Science y Scopus, de las cuales se seleccionaron 48 artículos para su revisión. El análisis de los datos, la presentación de resultados y la agenda de investigación siguieron el marco de teoría, contexto, características y metodología (TCCM).

Resultados – La revisión reveló especialmente que: (1) las publicaciones sobre la cocreación y codestrucción de valor habilitadas por IA están en las primeras etapas de desarrollo; (2) pocos artículos han abordado la codestrucción de valor, y el principal énfasis de la investigación está en la cocreación de valor; (3) las interacciones entre actores humanos y actores no humanos autónomos habilitados por IA están resultando en cocreación o codestrucción de valor, o ambas, y es probable que estos fenómenos también ocurran cuando la IA reemplaza a más de un actor humano en el encuentro de servicio; (4) la IA es considerada un actor no humano cada vez más independiente que integra recursos e interactúa con otros actores, pero se requiere prudencia en su adopción.

Originalidad/valor – Esta revisión llena un vacío al explorar conjuntamente la cocreación y codestrucción de valor en el contexto de la IA, presenta una visión general de los temas discutidos y proporciona una agenda de investigación con direcciones para estudios futuros.

Palabras clave Inteligencia artificial, Chatbot, Interacción humano-IA, Robot de servicio, Revisión sistemática, Formación de valor

Tipo de papel Revisión de literatura

人工智能驱动的服务互动中的价值共创与共损：文献综述与研究议程

摘要

目的 – 人工智能（AI）在前线服务接触中的应用已成为服务营销中的一个日益增长的现象，这可能带来正面和负面的结果。在这一背景下，本文旨在回顾关于人工智能驱动的服务互动中价值共创与共损的文献。

设计/方法论/方法 – 采用PRISMA协议进行了系统文献综述。数据从Web of Science和Scopus数据库中提取，共选择48篇文章进行审阅。数据分析、结果呈现及研究议程遵循理论、背景、特征与方法论（TCCM）框架。

发现 – 综述特别揭示了以下几点：(1) 关于AI驱动的价值共创与共毁的出版物尚处于发展初期; (2) 针对价值共损的文章较少，主要研究重点集中在价值共创上; (3) 人类参与者与AI驱动的自主非人类参与者之间的互动，可能导致价值共创或价值共损，甚至同时发生，特别是在AI替代多个服务接触中的人类参与者时; (4) AI被视为越来越独立的非人类参与者，它整合资源并与其他参与者互动，但在采用过程中需谨慎。

原创性/价值 – 本综述填补了在AI背景下共同探讨价值共创与共损的空白，概述了相关问题，并提供了未来研究方向的议程。

关键词 人工智能，聊天机器人，人机互动，服务机器人，系统综述，价值形成

文章类型 文献评论

1. Introduction

The adoption of artificial intelligence (AI) is considerably altering service encounters as it takes on a central role in the interaction between providers and customers (Larivière *et al.*, 2017). The modifications are due to the adaptation of AI for performing various tasks and the development of different intelligences (Huang and Rust, 2021), minimizing the human presence in service interactions (Bolton, 2020; Wirtz *et al.*, 2018). AI-enabled technologies, such as virtual agents and

service robots, promote a human−AI interaction format that is progressively changing business (Huang and Rust, 2021). In the face of technological transition and transformation, researchers have highlighted research gaps related to the need for a broader understanding of service interactions, mainly considering changes in the customer−provider relationship and customer experience (Bolton, 2020; Ostrom *et al.*, 2021; Rosenbaum and Russell-Bennett, 2021).

With the adoption of AI in service encounters, it is pertinent to revisit the value cocreation approach to understand how it will be affected, considering that service interactions are its focus of analysis. In cocreation, value is seen as increasing the well-being of actors and is (co-)created in the exchange of services through interaction between actors and the integration of differentiated resources (Vargo and Lusch, 2016). AI can change users' perceptions of value, given less human participation in service encounters (Ameen *et al.*, 2021). It should be noted that there are advantages and disadvantages to adopting digital and technological services, and undesirable consequences may occur (Rosenbaum and Russell-Bennett, 2021). In this sense, on the one hand, the personalization of the offer and the greater possibility of access to services are factors that can be considered favorable and, on the other hand, privacy and trust are concerns of customers in these service encounters with AI (Ostrom *et al.*, 2019).

Given this, service interactions enabled by AI can be positive but also problematic. In this way, just as value is cooperatively created – co-created – (Vargo and Lusch, 2016), it can also be collaboratively destroyed – co-destroyed (Echeverri and Skålén, 2021; Plé and Cáceres, 2010) in these interactions. Value codestruction is "a process of interaction between service systems that results in a decline in the well-being of at least one of the systems" and occurs due to the misuse of resources (Plé and Cáceres, 2010, p. 431). Studies on value cocreation in marketing have developed considerably in recent years; however, research on codestruction is incipient (Echeverri and Skålén, 2021; Järvi *et al.*, 2018; Laud *et al.*, 2019).

Some literature reviews have explored value cocreation in the hotel and tourism segment (Carvalho and Alves, 2023), interactive value formation from the perspective of value codestruction (Codá and Farias, 2022), cocreation and codestruction supported by information technologies (Li and Tuunanen, 2022) and AI and robots in value cocreation (Kaartemo and Helkkula, 2018). However, no known systematic reviews have jointly investigated the value cocreation and value codestruction in AI-enabled service interactions. Considering the above, this systematic literature review sought to answer the following question: How has the literature discussed the concepts of value cocreation and value codestruction in AI-enabled service interactions considering theory, context, characteristics and methodologies? To understand the question, this work aims to review the literature on value cocreation and value codestruction in AI-enabled service interactions, considering theory, context, characteristics and methodologies.

Organizations that invest in technologies and knowledge usually increase their competitive advantage (Bilgihan and Wang, 2016). Thus, research on AI technologies is essential to assist organizations in decision-making in a context of accelerated change. In addition, the study contributes to expanding the literature that investigates value formation in management and marketing and to the growing general interest in the themes of AI, robotics and automation. The review fills a gap in the literature because, as far as we know, this is the first systematic literature review that jointly explores the concepts of cocreation and codestruction from an interaction perspective with AI. We provide an overview of the reviewed literature, theoretical and practical implications and an agenda for future research.

Next, in part 2, the theoretical framework on value cocreation and codestruction is discussed, and a brief explanation of AI as a service facilitator is provided. In section 3, the method and protocol used in the development of the review are described. Subsequently, the systematic review results are presented in part 4, followed by discussions and implications in

section 5. A research agenda is proposed in part 6, and finally, the paper concludes with the conclusion and limitations in section 7.

2. Theoretical background

2.1 Value cocreation and codestruction

Theoretical perspectives for a service-centered logic, as opposed to a goods-centered dominant logic, have resulted in consumers' active participation in interactive value creation with companies (Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2004). In this direction, Vargo and Lusch (2004) proposed the service-dominant (S-D) logic, in which service is the basis of exchange, and value cocreation occupies a central space. Value cocreation occurs when actors interact and integrate their resources, aiming for the mutual well-being of those involved (Vargo and Lusch, 2016). Value can be defined by a value-in-use approach (Grönroos and Voima, 2013) and by value in context (Chandler and Vargo, 2011). It is emphasized that value has an experiential nature, that is, "value is always uniquely and phenomenologically determined by the beneficiary" (Vargo and Lusch, 2016, p. 6). Resources are essential to the value cocreation process and are classified into operant, such as knowledge and skills, and operand, such as goods and physical resources. In short, operant resources act on operand resources to create benefits (Vargo and Lusch, 2016). Technology is an operand resource and also an operant resource, as it influences institutions, human action and the way value is determined value (Akaka and Vargo, 2014).

Despite the theoretical and practical contributions, the S-D logic is controversial (Wang *et al.*, 2019) due to the focus only on the positive side of value formation, not considering aspects of decrease or loss of value in the interactional process or the outcome of the interaction (Echeverri and Skålén, 2011; Plé and Cáceres, 2010). For this reason, Plé and Cáceres (2010) proposed the concept of value codestruction, as they argue that value can also have a negative side, reducing the well-being of at least one of the actors. Additionally, value codestruction can be explained by the difficulty of an actor following a script expected by other actors (Järvi *et al.*, 2020), which can occur due to the intentional or unintentional misuse of resources (Plé and Cáceres, 2010). Given the gap in understanding, Echeverri and Skålén (2011) presented the interactive value formation (IVF) framework as a theoretical support that jointly encompasses value cocreation and codestruction, assuming that there are congruent or incongruent elements in the relationship between actors.

Research on value codestruction has focused, on resources and service ecosystems on the one hand and practices on the other (Echeverri and Skålén, 2021). Furthermore, in general, there is no unifying understanding of the concept, so some researchers consider value codestruction as a negative process specific to cocreation and others as a decrease in value in a space of value variation that has a direct relationship with the cocreation (Cabiddu *et al.*, 2019; Echeverri and Skålén, 2021). Nonetheless, despite the conceptual distinction and interrelationship, there is a consensus on the occurrence of value codestruction (Lumivalo *et al.*, 2023). Varied reasons are given for value codestruction, such as the absence of information, insufficient trust, mistakes, lack of clear expectations (Järvi *et al.*, 2018) and poor understanding of how to integrate resources (Laud *et al.*, 2019).

2.2 Artificial intelligence as an enabler of service interactions

AI is a technology that imitates human intelligence to perform tasks in functions traditionally performed by humans, such as those related to understanding, language and learning (Huang and Rust, 2018), enabling interaction through natural language (Robinson *et al.*, 2020). Associated with other technologies such as deep learning and big data, AI goes beyond the limits of some human capabilities, analyzing, for example, large volumes of data (Bock *et al.*, 2020). However,

it generally lacks human characteristics of an emotional and social nature (Wirtz *et al.*, 2018). It is worth highlighting that AI intelligence levels develop in the direction of mechanics, thinking and feeling (Huang and Rust, 2021).

In service encounters, AI can act through sensing, learning, decision-making and actions (Bock *et al.*, 2020) in a physical or digital environment permeated by interrelated technologies (Larivière *et al.*, 2017). As an executor, AI enables customer interactions to deliver services (Ostrom *et al.*, 2019). Examples of technologies that assume this type of function are physical assistant robots (Bock *et al.*, 2020), chatbots (conversational agents) and voice-controlled digital assistants (Larivière *et al.*, 2017). Some AI-enabled technologies are called service robots due to their learning, autonomy, adaptation, interaction and service-offering characteristics, which may or may not have a human appearance (Wirtz *et al.*, 2018). Notably, AI can replace employees, customers or both (Robinson *et al.*, 2020).

3. Method

The systematic literature review method was adopted to carry out this work, which consists of the methodical selection of studies published on a given subject for understanding and synthetic explanation of the literature. Thus, it is possible to identify broader evidence and conclusions that guide and justify future research (Siddaway *et al.*, 2019). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was used, which assists in detailing the criteria used in systematic reviews, following four steps to collect the review files: identification, selection, eligibility and inclusion (Moher *et al.*, 2009). Furthermore, according to the instructions of Koseoglu and Arici (2023), content limits are explained below, considering the keywords used in the search for articles (identification of limits), selection of databases (search for limits) and reading titles, abstracts and full text (confirmation of limits).

In the identification phase of works for the composition of the collection, based on the problem and the research objective, the following search descriptors were used: ((“value co-creat*” OR “co-creat* value” OR “value co-destruct*” OR “co-destruct value” OR “Resource* integration” OR “resource* disintegration” OR “interactive value formation” OR “value formation” OR “co-creat*”) AND (“artificial intelligence” OR AI OR chatbot* OR robot* OR “virtual agent *” OR “virtual assistant*” OR “voice assistant*”)). The documents were retrieved from the Web of Science and Scopus databases, as they have many relevant publications and are, therefore, frequently used by researchers in the area of management and business (Koseoglu and Arici, 2023; Mariani *et al.*, 2018). A search was carried out by topics, in which the defined terms could be identified in the titles, abstracts or keywords. Search engines, quotation marks and Boolean operators (OR and AND) were used to define the search filter criteria. Furthermore, “article” published in journals was defined as the type of work and “English” as the language. The searches were conducted in June 2023, and an initial date for including articles was not defined.

Aiming for reliability (Koseoglu *et al.*, 2022), duplicate documents were extracted and verified automatically using the R software Bibliometrix package and manually in Excel spreadsheets. Thus, by eliminating duplicates, 335 articles were retrieved. Only articles belonging to journals classified in the Q1 and Q2 quartiles of the Journal Impact Factor Rank (JCR) or the SJR Scimago Rank were selected to ensure quality; therefore, 290 articles met this criterion. In the other phases, the focus of discussion for value cocreation and codestruction enabled by AI was considered an inclusion criterion. In sorting the articles by reading the titles and abstracts, 186 papers were eliminated. The full texts were read in the eligibility phase, and considering the inclusion and exclusion criteria, 48 empirical and theoretical articles were included in the sample for the review. The following (Figure 1) is an information flow diagram of the PRISMA protocol with the respective phases.

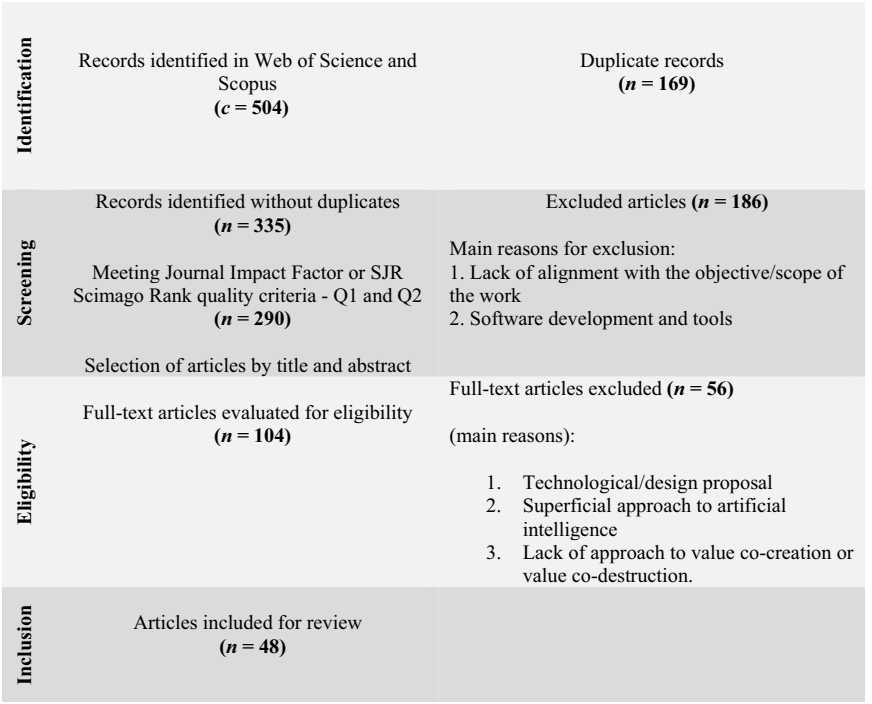

Figure 1. Information flow of the phases of the systematic literature review

Data analysis followed a categorization of content based on the theory, context, characteristics and methodology (TCCM) framework by Paul and Rosado-Serrano (2019). At this stage, Excel software spreadsheets were used to categorize the data. Furthermore, the TCCM framework guided the presentation of results and the proposed research agenda.

4. Results

This section presents the results found in the reviewed literature following the TCCM framework (Paul and Rosado-Serrano, 2019).

4.1 Theoretical foundations

The reviewed literature did not present a uniform theoretical basis. However, S-D logic stood out as the most used approach in the theoretical foundation of the articles analyzed since value cocreation is an axiom of the respective theoretical lens that has occupied a relevant space in services marketing. There was also the use of literature on the theoretical construction of value cocreation from the service logic perspective (such as Grönroos and Voima, 2013). In a more limited way, the basis of the concept of codestruction was observed with the citation of the seminal articles by Plé and Cáceres (2010) and Echeverri and Skålén (2011). Considering the focus of the research, conceptual bases on AI and emerging

intelligent technologies also supported the construction of the articles, as well as bases on robotics and automation. In a more fragmented way, other lenses, perspectives and concepts were also identified, such as technology adoption, customer experience, service interaction, human−computer interaction, diffusion of innovation, trust, human-machine cocreation and service innovation, among others.

With AI, the discussion of technology beyond operand resources, that is, as an operant resource, becomes evident around S-D logic. It was found that AI is simultaneously an operand resource as it is interfered with by knowledge, experience and skills to improve its performance, and it is also an operant resource, as AI learns and acts through algorithms to improve the performance of humans (Paschen *et al.*, 2021). Thus, it is an operant resource as technology assists and expands decision-making capacity in complex contexts (Barile *et al.*, 2021; Kondapaka *et al.*, 2023). For Mele *et al.* (2021), AI can affect the agency power of actors and interaction practices in the service ecosystem, potentially expanding access to resources and improving engagement. Notably, AI acts as an operant resource when following interpretative schemes designed by humans, since only humans have the interpretative capacity related to decision-making that transcends data manipulation and adheres to human values and beliefs according to the context (Barile *et al.*, 2021).

Based on the reviewed literature, co-creating value in AI-enabled interactions is a complex process (Paschen *et al.*, 2021) between human and autonomous nonhuman actors (Grundner and Neuhofer, 2021; Neuhofer *et al.*, 2021) where roles, resources, nature and quantity of contributions differ (Paschen *et al.*, 2021). Data is essential in this service interaction (Breidbach and Maglio, 2020). Furthermore, understanding the value cocreation in AI-enabled services depends on ecosystem analysis, considering the various actors interacting (Leung and Loo, 2022; Payne *et al.*, 2021a). In short, it is a recent and progressive phenomenon that depends on human and nonhuman behaviors (Zhu *et al.*, 2022), requiring theoretical deepening (Wen *et al.*, 2022).

Value codestruction processes can occur in interactions with AI, causing a reduction in the well-being of at least one actor (Castillo *et al.*, 2021). As described by Čaić *et al.* (2018), AI has, at the same time, the potential for value cocreation and codestruction, causing trade-offs in the value formation since, in the case of socially assistive robots in elderly care, the beneficiary may recognize it as an invader of their privacy and, on the other hand, a family member may consider it a facilitator. This duality in value formation is portrayed by Neuhofer *et al.* (2021) as "ambivalent value cocreation," as AI technologies can fail, causing annoyance, fear and increasing waiting times and, on the other hand, AI has, among other potentialities, the ability to make highly personalized offers.

4.2 Context

Regarding the publication period (Table 1), it was found that 2018 was the first year in which publications with the search focus used were presented. The years 2021, 2022 and 2023 had the highest number of published works, showing that the theme is recent, under development and there is a growing research interest.

Based on indications of the location where the data were extracted, it was found that most of the empirical articles, approximately 40%, were developed with data collected in China. Less significantly, studies were identified in Australia, Austria, Belgium, Canada, the USA, France, India, Italy and Malta. In some studies, data were collected in several countries; in others, the data collection location was not reported. In addition, we found that the articles were mainly made in the banking, hospitality and tourism and health sectors. Only one investigation focused on the public sector.

Table 1. Publications by year

Publication year	Paper
2018	Bolton *et al.* (2018); Čaić *et al.* (2018); Castellano *et al.* (2018)
2019	Buhalis *et al.* (2019); Čaić *et al.* (2019); Gao and Huang (2019)
2020	Breidbach and Maglio (2020), Zhang (2020)
2021	Barile *et al.* (2021); Castillo *et al.* (2021); Gao and Huang (2021); Grundner and Neuhofer (2021); Hsu *et al.* (2021); Lalicic and Weismayer (2021); Leone *et al.* (2021); Li *et al.* (2021); Lin and Mattila (2021); Mele *et al.* (2021); Neuhofer *et al.* (2021); Paschen *et al.* (2021); Payne *et al.* (2021a); Payne *et al.* (2021a)
2022	Anayat and Rasool (2022); Buhalis and Moldavska (2022); Chuah *et al.* (2022); Dodds *et al.* (2022); Flavian *et al.* (2022); Leung and Loo (2022); Mabillard *et al.* (2022); Mele *et al.* (2022); Scutella *et al.* (2022); Solakis *et al.* (2022); Vieira *et al.* (2022); Wen *et al.* (2022); Xie *et al.* (2022a); Xie *et al.* (2022b); Zhang *et al.* (2022); Zhu *et al.* (2022)
2023	Gao *et al.* (2023); Hottat *et al.* (2023); Jain *et al.* (2023); Jia *et al.* (2023); Kondapaka *et al.* (2023); Liu *et al.* (2023); Megaro *et al.* (2023); Nannelli *et al.* (2023); Saviano *et al.* (2023); Yang (2023)

Notes: Articles searched in June 2023

4.3 Characteristics of the articles analyzed

The characteristics are divided into two categories based on the discussion focus of the analyzed articles: an approach to value cocreation and an integrated approach − value cocreation and codestruction. Of the 48 papers analyzed, 41 discussed value cocreation, and seven dealt jointly with value cocreation and codestruction.

4.3.1 Approach to value cocreation. With the evolution and massive adoption of AI, integrating the digital, physical and social domains will shape the customer experience and value cocreation in environments that tend to gradually become of high digital density (Bolton *et al.*, 2018). Value cocreation with AI is a prominent theme in AI research in marketing (Anayat and Rasool, 2022). Chatbots, service robots, machine learning and natural language processing are some AI-based technologies influencing value cocreation (Solakis *et al.*, 2022). In tourism research, the experience in augmented reality and virtual reality for the value cocreation process was identified as a growing thematic field (Nannelli *et al.*, 2023). In this context, psychological distance and cognitive processing influenced the adoption of digital services (Jia *et al.*, 2023).

AI influences the value cocreation process by expanding the capabilities of self-understanding, control and action (Mele *et al.*, 2021) and helping decision-making in a complex environment (Barile *et al.*, 2021). In this direction, humans and AI can act harmoniously to co-create value in decision-making (Kondapaka *et al.*, 2023). Human actors are cited as essential for the value cocreation with AI, as the interaction depends on their domain in the development and use of technologies; in addition, they act in the continuous improvement of algorithms (Paschen *et al.*, 2021).

Perceived personalization, autonomy, community identity, trust and self-efficacy influence consumer value cocreation behaviors toward AI (Wen *et al.*, 2022), as well as efficiency, degree of control, content quality and information security (Zhu *et al.*, 2022). Also, Gao *et al.* (2023) found that the interactivity perceived by customers based on AI stimuli positively affects value cocreation. Solakis *et al.* (2022) pointed out that customer

perceptions, attitudes, confidence, social influence, hedonic motivations, anthropomorphism and experience can influence the value cocreation process. Moreover, AI service quality can promote a more pleasant cocreation experience (Yang, 2023). Furthermore, data-centric business models impose ethical challenges and change actors' roles in value networks (Breidbach and Maglio, 2020).

A considerable part of the reviewed studies discussed using service robots in the hospitality and tourism areas. In the hotel segment, the intention of co-creating value for customers was observed by the very novelty of the robotic service (Xie *et al.*, 2022b), as well as by the high proactivity of tourist service robots, favored by empathy with robotics (Xie *et al.*, 2022a). However, the dehumanization of the process is also evidenced (Buhalis *et al.*, 2019). The perceived privacy, functional benefits and appearance of service robots are drivers of value cocreation (Lin and Mattila, 2021). The robotic services available in restaurants were seen as contributors to the value cocreation process with the customer (Jain *et al.*, 2023), positively affecting customer attitudes (Chuah *et al.*, 2022). One research with a restaurant service robot showed that the attributes role meaning, competence, social presence, cordiality, autonomy and adaptability promoted value facilitation effects in the process of cocreation (Zhang *et al.*, 2022). In addition, customers can have improved experiences by integrating intelligent technologies into the gastronomic service network (Leung and Loo, 2022).

In the health area, trust is a central element for value cocreation, in which AI innovations can favor well-being from a transparent approach (Megaro *et al.*, 2023). Furthermore, the human−technology interactions provided by cognitive assistants intensify the value cocreation through the possibility of sharing and integrating resources from various network actors (Mele *et al.*, 2022). According to Mabillard *et al.* (2022), AI has a strong potential to support diagnosis and treatment in the health area, and it should be used to strengthen the cocreation relationship between the doctor and the patient without replacing human interactions. In health services, the well-being of actors can be enhanced through shared control, increased dialogue and access to information (Dodds *et al.*, 2022), as well as through collaborative decisions with AI (Liu *et al.*, 2023).

Technological discomfort influenced the adoption of robo-advisors in the banking/financial sector due to their simplicity and lower requirement for customer participation (Flavian *et al.*, 2022). In AI-enabled mobile banking systems, the service delivery configuration, safety and security influenced value cocreation (Payne *et al.*, 2021b). In B2B segments, AI enables value cocreation when network actors, especially end users, are involved in developing technological solutions (Leone *et al.*, 2021; Li *et al.*, 2021). Research on AI-enabled smart TV has revealed that cocreation is an antecedent of perceived usefulness (Gao and Huang, 2019), and two-way communication and personalization affect cocreation (Gao and Huang, 2021).

Regarding virtual assistants, it was found that dialogue and access to information are benefits of these technologies in the cocreation process and influence consumers' online trust (Castellano *et al.*, 2018). Voice assistants can support cocreation through a more personalized service (Buhalis and Moldavska, 2022); in that direction, the interaction between people with disabilities and voice assistants resulted in well-being (Vieira *et al.*, 2022). Super-functionality, personalization and convenience influenced consumers' perception of value cocreation in the use of service chatbots (Lalicic and Weismayer, 2021). On the other hand, high emotional complexity was highlighted as a criterion for human agents to take over a conversation between customers and AI (Saviano *et al.*, 2023). In public service, four dimensions of value in use were identified from citizens' interactions with virtual agents: path to human support, engagement/interaction, connection and personalization (Scutella *et al.*, 2022).

4.3.2 Integrated approach − value cocreation and codestruction. On the dual potential of value cocreation and codestruction, Čaić *et al.* (2018) identified that socially assistive robots in elderly care can assume different roles in the value network, for example, as a facilitator, intruder, ally and substitute. In another research, Čaić *et al.* (2019) mention that the potential for value cocreation/codestruction depends on dimensions of social cognition. As mentioned by Grundner and Neuhofer (2021), AI can minimize the customer experience as social contact is reduced, leading to the value codestruction due to the massive use of technology; on the other hand, when AI provides personalized offers and information in real time, the experience can be positive by promoting the value cocreation.

Neuhofer *et al.* (2021) mentioned that the degree of AI interference in the customer experience, such as authoritarian intrusion or encouraging assistance, can lead, respectively, to value codestruction or cocreation. According to Hsu *et al.* (2021), when customers consider themselves responsible for poor resource integration, they tend to continually co-create value with the company; however, they are prone to co-destroy value when they realize that the company is at fault. Hottat *et al.* (2023) point out that the profile of the public and the context are determinants of the potential for cocreation/codestruction; for example, automation is not well accepted in high-risk services (hospital services) and high-priced services (luxury restaurants and hotels); in these cases, human interaction is preferred.

Castillo *et al.* (2021) more specifically addressed the codestruction process in AI-enabled service interactions, drawing on the value-cocreation literature. The authors identified authenticity problems, cognition challenges, affective problems, functionality problems and integration conflicts as antecedents of codestruction from a client perspective using chatbots. They also reported that negative interactions trigger losses of customer resources, leading to the choice of more expensive service channels, service termination and public complaints about the company (Castillo *et al.*, 2021).

4.4 Methods used

Of the works analyzed, more than 70% consist of empirical studies, followed by theoretical-conceptual studies, systematic literature reviews and bibliometrics. As for the methodological approach, it was found that 56% of the studies used a qualitative approach, 33% quantitative and 10% mixed. It should be noted that some empirical research was configured as theoretical-empirical, as it involved the development of a theoretical or conceptual model. In qualitative empirical studies, data collection was predominantly carried out through interviews and focus groups, and data were analyzed using thematic analysis and coding. On the other hand, quantitative empirical research is primarily carried out through surveys, in which the most recurrent data analysis was structural equation modeling.

5. Discussion and implications

AI disruptively changes the conventional structure of relationships between companies, customers and other service actors in a service ecosystem, implying different interaction formats by replacing one or more human actors in service encounters (Robinson *et al.*, 2020). This technology has been discussed as an operant resource of one of the actors, commonly the service provider (Castillo *et al.*, 2021). However, the discussion goes beyond aspects of framing AI as operand and operant resources and gains evidence as an actor integrating these resources and interacts socially using increasingly natural language. Given the above, AI is considered an autonomous nonhuman actor (Grundner and Neuhofer, 2021; Neuhofer *et al.*, 2021), which imposes complexity on service interactions and value formation (Paschen *et al.*, 2021).

In progressively digital and technological service ecosystems, interactions between human actors and AI-enabled autonomous nonhuman actors (human−AI interaction) can result in value cocreation or value codestruction, or both. These value formation phenomena are also likely to occur in service encounters where more than one actor is replaced by AI (AI −AI interaction). AI, as a nonhuman actor, will increasingly act independently, considering that it is in the early stages of development. As the intelligence levels of this nonhuman actor evolve (Huang and Rust, 2021), it will become more autonomous and popular in service encounters. Consequently, the greater the development of AI, the greater its ability to achieve the premises of value cocreation, moving closer to successful human interactions. It is noteworthy that AI autonomy (Neuhofer *et al.*, 2021) is guided by human actors and follows human interpretative systems (Barile *et al.*, 2021), which is why we reinforce that AI needs to be guided by principles that minimize prejudices, discrimination and undue favoritism.

AI expands the potential of value cocreation due, for example, to scaled service, convenience, availability and personalization (Buhalis and Moldavska, 2022; Lalicic and Weismayer, 2021; Neuhofer *et al.*, 2021; Payne *et al.*, 2021b). However, risks and challenges related to value codestruction are evident, such as a lack of human touch, empathy, emotional intelligence, transparency, security, data privacy, and the existence of algorithmic bias (Bolton *et al.*, 2018; Breidbach and Maglio, 2020; Castillo *et al.*, 2021; Wen *et al.*, 2022; Zhu *et al.*, 2022). Furthermore, the resources integrated by AI are sometimes limited, and it may not progress in conversation and resolve user demands (Saviano *et al.*, 2023).

Data are essential resources for AI to operate and are provided by actors consciously or unconsciously (Breidbach and Maglio, 2020). In this aspect, the lack of trust for integrating resources in the service relationship with technology, for example, due to ethical issues, can threaten the value cocreation process (Paschen *et al.*, 2021). Therefore, the value formation in AI-enabled interactions inevitably presupposes complete and reliable data integration; thus, organizational and legal instruments that guarantee transparency and secure data sharing are needed.

In comparison, often in a relationship between humans, even if some resources integrated by the service provider are limited, human communication and emotional intelligence can alleviate the user's discontent and calm tensions. On the other hand, AI is promising for its broad cognitive capabilities, but a challenge for value formation lies in developing its affective aspects, especially when customers are disappointed with the lack of understanding and empathy for human emotions (Castillo *et al.*, 2021). Therefore, AI technologies must evolve in affective and subjective aspects to provide a more satisfactory user experience and minimize the chances of value codestruction.

Considering that AI can make humans' operant resources more potent by improving their decision-making capabilities (Barile *et al.*, 2021), we reinforce that the combination between them can be promising for value cocreation. Services must be supervised and, when necessary, carried out or completed by humans who utilize AI as partners, enabling the enhancement of human intelligence. In short, a synergy between humans and AI tends to promote superior value outcomes in service ecosystems, as the capabilities of both can be leveraged.

The articles identified in this review focused mainly on value cocreation, and few articles addressed value codestruction. Despite the findings in the results, there is no broad and deep understanding of the antecedents, manifestations, causes and processes of value cocreation enabled by AI and even less about value codestruction due to the low volume of publications.

Regarding the theoretical foundations, Vargo and Lusch (2017) point the S-D logic as a cohesive general approach; however, they do not address the possibility of value codestruction (Echeverri and Skålén, 2021; Plé and Cáceres, 2010). Therefore, we endorse the need to expand the scope of the S-D logic axioms (Plé and Cáceres, 2010; Wang *et al.*, 2019) based on the

recognition that the interaction and integration of resources are subject to uncertainties and complexities that can cause value codestruction, especially in a period of rapid and intense adoption of AI. Thus, if the S-D logic encompassed the codestruction construct, the perspective could offer a more balanced and integrative analysis lens that aligns with reality and organizational practice. Echeverri and Skålén (2021) recognize that the value cocreation and codestruction are part of the same analysis structure, the IVF. Nonetheless, theoretical advances are needed regarding AI, as a nonhuman actor, being involved in IVF and affecting the conceptual structure of IVF in terms of transition between constructs.

5.1 Contributions to theory and knowledge

This research responds to calls for investigation made by Bolton (2020), Ostrom *et al.* (2021) and Rosenbaum and Russell-Bennett (2021), considering the rapid diffusion and adoption of emerging technologies. This way, we contribute with researchers and academics by presenting an overview of the literature on value cocreation and codestruction in AI-enabled interactions. To our knowledge, this is the first systematic literature review that jointly explores the respective concepts related to AI usage. Furthermore, we collaborate with the understanding of the themes, especially when considering the negative side of value formation. The results and research agenda were presented following the TCCM structure (Paul and Rosado-Serrano, 2019), presenting the theory, context, characteristics and methodology of the articles analyzed. The suggestions and research questions aim to collaborate with developing new studies and the field's maturation.

5.2 Contributions to management and practice

This research provides organizations with information that guides them in adopting and managing AI technologies for customer interaction and customer service. In a period of progressive use of AI and changes in business processes, organizations must know how to use it ethically and strategically. Therefore, the presented results help managers assess the potential for value cocreation/codestruction in the adoption and application of AI, providing knowledge that supports organizational policies and assists in decision-making. For example, when implementing AI technologies, managers need to evaluate the potential for value cocreation according to the public profile, as in some segments, the technologies may not be well accepted (Hottat *et al.*, 2023), while in others, there are advantages that strengthen the customer experience.

There are many possibilities for applying AI to customer service, interaction and service provision, such as the use of virtual assistants and service robots, as well as through the improvement of self-service and automation platforms. However, there are challenges and risks related to the loss of well-being, which require planning, responsible monitoring and focus on the beneficiary. There is, for example, the need to develop cognitive and affective aspects, including empathy and emotional intelligence. In addition, it is noteworthy that some sectors, such as hospitality and tourism, can benefit more from the findings already highlighted in the literature while facing the ongoing challenge of closely monitoring sector trends.

Table 2 summarizes the research conclusions and implications.

6. Research agenda

It was found that there is a need for greater understanding and theoretical and empirical deepening related to the value cocreation and codestruction in AI-enabled service interactions. For this reason, a research agenda is proposed below with lines and questions for investigation, following the TCCM framework (Paul and Rosado-Serrano, 2019).

Table 2. Conclusions and theoretical and managerial implications

Conclusions	Theoretical and managerial implications
Publications on value co-creation and co-destruction in AI-enabled interactions are in the initial stages of development, and research primarily focuses on value co-creation	An overview of the literature and a research agenda on value co-creation and co-destruction in AI-enabled interactions are presented
The interaction between human actors and AI-enabled autonomous nonhuman actors can results in value co-creation or value co-destruction, or both. These phenomena can also occur when AI replaces more than one human actor in the service encounter	When adopting AI, managers need to assess in advance the potential for value co-creation and value co-destruction
AI is an increasingly independent nonhuman actor that integrates resources and interacts with other actors, but caution is needed in its adoption	There are several possibilities for applying AI, but risks related to loss of well-being require responsible monitoring and a focus on the beneficiary

Theoretical foundations – Toward a comprehensive understanding of value formation in interaction with AI, we suggest the integrated use of the S-D logic theoretical perspective with the concept of value codestruction and also with the IVF structure to, from this, jointly investigate the constructs value cocreation and value codestruction, verifying how the transition between them occurs. We encourage the expansion of research on AI as an operant resource and, more importantly, as an autonomous actor integrating resources. We also suggest investigating how AI affects value formation at the ecosystem level. As well as examining the intentional and unintentional value codestruction in interactions with AI. Given the above, we present below some research questions (RQ):

RQ1. How could the S-D logic encompass the construct of value codestruction in a framework that supports and strengthens the analysis of interactions with AI?

RQ2. How can multiple organizations in an ecosystem that uses AI integrate resources for a value cocreation relationship?

RQ3. How can organizations structure service systems in a balance between AI and humans, resulting in value cocreation for ecosystem actors?

Other consolidated theoretical lenses can help to understand the phenomenon, such as the actor-network theory (ANT), in which controversies, negotiations and conflicts exist in a network whose interaction can occur between human actors or also between human actors and nonhuman actors (Latour, 2007). It is up to the study of AI to understand the extent to which technology and algorithms (or even algorithmic biases) exercise agency ("distributed agency") in decisions over which one would expect that only the human actor could exercise. However, as in the machine learning process, the machine is taught (and learns), and then we transfer to it, in a certain way, the power of agency in certain processes of interaction and dispute resolution. Gutiérrez (2023, p. 4) opines that "ANT can help understand how actants and human actors are mutually dependent and influential in a network of interactions that shape the outcomes of their joint endeavors". ANT shows that relationships between humans and AI (nonhuman actant) are not passive. Actors may use shortcuts or hacks to take advantage of programs, consciously and critically/actively explore algorithm actions, or surrender to them. It is necessary to recognize that the system adjusts its approach according

to feedback from human actors (Gutiérrez, 2023). ANT is a theory that can serve as a theoretical-philosophical-conceptual basis and even a methodological approach for studying algorithmic bias, equity, relationship of forces, controversies, and ethical, technological and systemic challenges in implementing AI. Some research questions can guide this discussion:

RQ4. How does ANT facilitate the ontological discussion of the use of AI in interactions, specifically regarding the attribution of agency to nonhuman actors?

RQ5. What are the possible ethical and social implications, and what are the controversies to be mapped and known in human-AI interaction?

Furthermore, we suggest the lens of institutional theory (North, 1990; Scott, 2013) to help understand how institutions can promote well-being in AI-intensive service ecosystems. Institutions are rules, norms and cognitive-cultural beliefs that shape organizational and social behavior (Scott, 2013). Therefore, this theoretical current can serve in the investigation of value formation and can guide or shape the development and adoption of AI, such as, for example, institutional influence (Scott, 2013), stability, institutional change (North, 1990), legitimacy and isomorphism (DiMaggio and Powell, 1983; Scott, 2013). Thus, we raise some more questions for future research:

RQ6. How do institutions influence the development of AI for service interaction and value cocreation?

RQ7. How is value formation affected by the restructuring of institutional arrangements brought about by AI?

RQ8. How do privacy and data security standards and regulations favor the reduction/minimization of the potential for value codestruction?

RQ9. Do AI's legitimacy and social acceptance for interaction in service relationships influence value formation?

RQ10. How does the isomorphism caused by the intensive adoption of AI for customer service affect value formation?

RQ11. How is AI driving institutional change and innovation in service interactions and value formation?

RQ12. How can public and private organizations coordinate institutional AI arrangements, avoiding exclusion and lack of assistance to populations without access to digital technologies?

Context – We encourage the replication of research in different territories, as most research has been carried out in Asia, emphasizing China. It should be noted that different characteristics between emerging and developed countries, with different maturity levels in applying AI, can bring results that contribute to a detailed understanding of the subject. It is recommended that investigations be expanded beyond the hospitality and tourism, banking and health sectors so that other sectors also benefit from knowledge about value formation made possible by AI. As previously mentioned, the public sector has a significant research gap. Furthermore, adopting AI affects the labor market in different sectors; thus, the notion of social value cocreation/codestruction in the context of AI can assist in more sustainable value processes, analyzing the impacts for various actors in the ecosystem. We also recommend studies with micro and small companies so that they can be favored with AI and not be disadvantaged compared to the technological investment capacity of medium and

large companies. We suggest investigating different aspects of user−AI interaction in virtual and physical environments associated with the Internet of Things (IoT) and related to domestic, commercial and public use. We also suggest that researchers evaluate the value cocreation/codestruction in different technologies that apply AI. As research questions, we formulate:

RQ13. Does the context (country, culture, continent) in which the actors live interfere with the value cocreation/codestruction in interactions with AI?

RQ14. How can AI be used in the public sector to enhance well-being and perceived value in providing services to citizens?

RQ15. Will B2B customers tend to co-create or co-destroy value in interactions with AI?

Characteristics – In service interactions between the human actor and AI, there are two almost unexplored gaps in the literature:

(1) the specific discussion of value codestruction; and

(2) the integrated discussion of value cocreation with value codestruction.

Because of the above, it is recommended that research be carried out that explicitly covers these gaps, for example, mapping antecedents, manifestations, elements and consequences of value cocreation and codestruction. These searches will also be useful in cases where the AI represents more than one actor. Considering some sensitive issues in the use of AI that can minimize the well-being of actors, there is a need for more research on privacy, ethics, governance, security, transparency and algorithmic bias. In addition, some research questions are pointed out:

RQ16. Does the consumer profile, such as education level, gender, age and income, affect value cocreation and codestruction in interactions with AI?

RQ17. Considering operant resource integration, what competencies, skills and knowledge influence value cocreation and codestruction in interactions with AI?

RQ18. How willing are consumers to learn to interact with AI in order to achieve value cocreation?

RQ19. How do value cocreation and codestruction behaviors in interactions with AI affect other marketing variables, such as satisfaction, loyalty and organizational image?

RQ20. Does the training offered to beneficiaries to interact with AI lead to satisfactory value formation results?

RQ21. How does the absence of human contact influence the value cocreation/codestruction?

RQ22. Does the possibility of the beneficiary choosing between AI or human service influence their value perception?

RQ23. How do data privacy, security and transparency affect the value cocreation and codestruction in interactions with AI?

Methods – From a methodological standpoint, the development of empirical studies, such as qualitative research, is recommended, which allows for an in-depth understanding of the phenomenon, especially regarding research associated with technologies still in the initial

phase of diffusion and adoption. On the other hand, quantitative studies are needed to generalize findings on human−AI interactions, and experimental research helps obtain greater explanatory power. In this aspect, it is advisable to develop and validate scales. Moreover, longitudinal studies help track value formation over time and can help answer the following research questions:

RQ24. How is value formation modified in the long term with the development and improvement of AI-enabled platforms?

RQ25. Over time, will people's familiarity with AI broaden their value cocreation perception?

7. Conclusion and limitations

This review revealed that interactions between human actors and AI-enabled autonomous nonhuman actors (human-AI interaction) can result in value cocreation or value codestruction, or both. Furthermore, these phenomena are also likely to occur in service encounters where more than one human actor is replaced by AI (AI−AI interaction). AI is seen as an increasingly independent nonhuman actor that integrates resources and interacts with other actors in service ecosystems. However, caution and balance are needed in its adoption, given the potential for mixed and multifaceted value formation.

Research on value formation in interactions with AI is in the introductory phase, with a low volume of publications. The greatest research emphasis is associated with value cocreation, and few articles have directly addressed the concept of value codestruction. In short, these are "hot" topics for research and theoretical-empirical deepening, given the progressive adoption of AI by organizations. As a way of contributing to the field, this work presents a detailed research agenda.

The review followed a rigorous and transparent process. Nonetheless, we point out some methodological limitations that may have limited the scope of the analysis, such as the selection of only two databases for retrieving articles, Web of Science and Scopus. Also, the journal selection criteria were based on scientific indicators, and although they ensured the selection of articles of recognized quality, they may have eliminated relevant works. Furthermore, only scientific articles published in English were retrieved. In future reviews, it is recommended to explore the topic with a broader scope, including research on AI and other associated technologies, such as the IoT, big data, and virtual reality, and to expand the databases researched.

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