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Data driven approaches for customer centric and service dominant value propositions: A systematic literature review

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Abstract

Novel marketing theories that focus on service dominant approaches require to deeply consider customer specifications and needs within using products and services by customers. In this way, data driven approaches that focus on analyzing customer behavior are critically important to realize service dominant logic of marketing. Although previous studies have proposed different approaches to enhance dynamic and customer centric value propositions, there is not a comprehensive view on data-driven approaches that can be used within this context. The main research question that is addressed in this paper is "what are the data-driven approaches, concepts, and practical domains that are addressed for customer centric value propositions to enable service ecosystems to co-create value with customers". To answer this research question, a systematic literature review is conducted. Based on the relevant evidence extracted from 124 papers, the approaches, core concepts, and key practical domains of customer centric value propositions are described. The paper aims to systematically bridge between prescriptive approaches and tools that have emerged in the field of data analytics and descriptive concepts that have introduced by novel marketing theories.

Keywords: Service dominant logic, value co-creation, value proposition, data driven approach, machine learning

1-Introduction

In the light of big data opportunities as well as artificial intelligence methods, data driven approaches have received considerable attention in the marketing context in recent years (France and Ghose, 2019, Saura, 2020). Within this context, different data driven approaches have been developed to analyze customer behavior (Hsieh, 2004, Seret et al., 2014), customer segmentation (Carnein and Trautmann, 2019), predicting customer expectations (Ding et al., 2017), recommending customer-centered products and services (Jain et al., 2020, Yuan and Yang, 2017), and supporting customer-centered operations (Rasouli, 2020, Fayyaz et al., 2020). Regarding the emerging service dominant paradigm within the marketing context (Lusch and Vargo, 2014), data driven approaches are used to enable service ecosystems to co-create customer-centered value. Co-creating customer-centric value within a service ecosystem requires understanding customer needs during usage of products and services.

It also needs to support dynamic collaborations among parties within a service ecosystem that are governed by customer-centric mechanisms (Rasouli et al., 2019, Rasouli et al., 2016).

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Among these requirements, proposing service dominant value propositions can be seen as the core capability to realize customer-centricity within service ecosystems (Payne et al., 2020) (Baldassarre et al., 2017). Although previous studies have proposed different approaches to enhance dynamic and customer-centric value propositions, there is not a comprehensive view of data-driven approaches that can be used within this context. The main research question that is addressed in this paper is "what are the data-driven approaches, concepts, and practical domains that are used for customer-centric value propositions to enable service ecosystems to co-create value with customers."

In order to answer the research questions, we perform a systematic literature review (SLR) in this research. The conducted SLR enables us to comprehensively explore data-driven approaches that are used to support customer-centric value propositions. On the basis of the review process that is described in the next section, evidence is extracted from 124 manuscripts. In order to better represent the results of the conducted SLR, the explored evidence is synthesized within related approaches, contents, and contexts. The rest of this paper is structured as follows. Section 2 introduces the SLR methodology. Following, section 3 presents the results of the conducted SLR. In section 4, we discuss the practical and scientific implications of the findings. Finally, we conclude this paper and point out the future direction in the section 5.

2-Methodology

In this section, the steps of the research methodology followed in this study are described. To provide a comprehensive view of the different data driven approaches that can be used to support customer-centric value propositions, we conduct a SLR. To do this, we follow the systematic procedures proposed by (Keele, 2007) (Tranfield et al., 2003). The systematic sequential processes that are followed, as described in **Error! Reference source not found.**, consist of five steps: plan the review, identification of research, selection of studies, study quality assessment, and data synthesis. The planning phase identifies the review objectives, and develops review protocols. In identification phase we defined search terms, generating a search strategy, and determine the search source. The study selection phase includes the study selection criteria, and study selection process. Quality assessment considers criteria to evaluate the quality of selected articles. The final phase, data synthesis involves the data extraction from the selected studies and sorting, and summarizing the results of retrieved studies. In the following this section, we describe how this process is carried out.

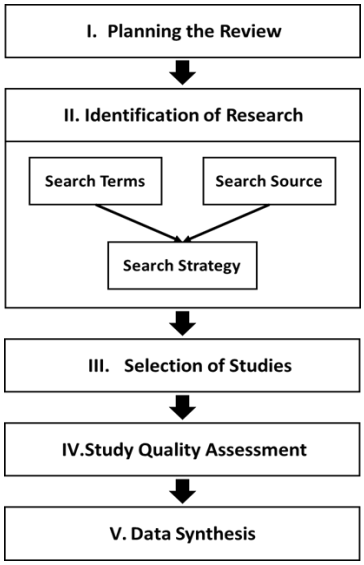

Fig 1. Systematic literature review procedure

2-1-Plan the review

The aim of this review is to bring together the accumulated knowledge about the service dominant and customer-centric value propositions. Regarding this aim the key research questions that are addressed within this study can be stated as:

RQ1: What are the data-driven approaches used to offer customer-centric value propositions to customers?

RQ2: What are the key concepts that are addressed to realize service dominant and customer-centric value propositions?

RQ3: The explored approaches and concepts in which practical domains are applied?

With respect to these research questions, we developed the review protocol of this SLR. The protocol depicted each step of the SLR process according (Keele, 2007). This SRL was conducted from April 2020 to March 2020.

2-2-Identification of research

The identification of the research begins with defining search terms, developing search process, and selecting search source which are described respectively.

2-2-1-Search terms

To build the search terms we identified the keywords relating to the context and the content of the research question; please see table 1. In order to ensure the relevance and comprehensiveness of these keywords, they are checked by three experts of the marketing domain.

Table 1. Keywords which were used for the systematic literature review

Search terms		
Context		**Content**
Customer centric		Value proposition
OR		**OR**
Customer oriented		Recommendation
OR	**And**	
Service dominant		
OR		
Service oriented		

2-2-2-Search strategy

The SRL requires a comprehensive search to obtain relevant source. To do this, we conduct the search for the determined terms on the web of science search engine. In addition, we identify the key researchers in this field and retrieve their related papers to our research question.

2-2-3-Search source

The article search was conducted through the web of science database, one of the high quality multidisciplinary databases to get extensive and comprehensive coverage of the papers as well as accessing

highly relevant papers. After applying search terms within the selected database, 1692 articles were retrieved.

2-3-Selection of studies

The retrieved papers were screened based on the exclusion and inclusion criteria. The following exclusion criteria were used:

- Studies that do not address customer-centricity and service dominant logic to propose value;
- Studies that do not focus on value co-creation concept;
- Studies that are not related to value proposition;
- Since the theories on service dominant logic of marketing and customer-centricity in value creation are introduced since 2004, studies prior to 2004 were excluded;

We included recommendation system papers, due to the fact that they can be considered as techniques that can be used to offer a value proposition to customers.

The selection of articles in this systematic review was organized in three steps. At the first step we carried out an assessment of the sources that are gathered base on their titles that resulted in the selection of 453 sources within this step. The second step is filtering the articles by abstract and conclusion, which resulted in 138 sources. At the final step, we screened the remained articles by full text. This process resulted in the 124 papers analyzed in this review.

2-4-Study quality assessment

All the articles in this study are obtained from a reliable database, e.g. the web of science, in which content is evaluated and selected based on the following criteria: impact, influence, timeliness, peer review, and representation.

As the Web of science uses multiple search and analysis capabilities to ensure scientific quality of the sources, we considered all of the retrieved articles as qualified evidence. Regarding the research question in our SLR, we focused on the relevance of the explored evidence as a criterion to assess the quality of gathered evidence.

2-5-Data synthesis

The essence of data synthesis is to collect and summarize the result of included articles in order to address or answer the research questions. In this research, we used a grounded theory approach to synthesize quality evidence explored within the previous steps. Grounded theory is comprised of three steps: open coding, axial coding, and selective coding. Within the open coding step, the explored evidence is tagged. To enhance the reliability of tagging, the labels are checked with two domain experts. In the axial coding step, the relating tags are categorized within the relevant classes. In the selective coding step, the core concept of the evidence categorized within the classes is identified.

3-Results

The investigation of the reviewed papers indicates that the number of papers that have focused on using data-driven approaches for customer-centric value proposition has been increased within the last five years, please see figure 2. Most of these papers have been published within the marketing, operations management, and data-science related journals; please see figure 3 for more detail on the journals that have published related papers.

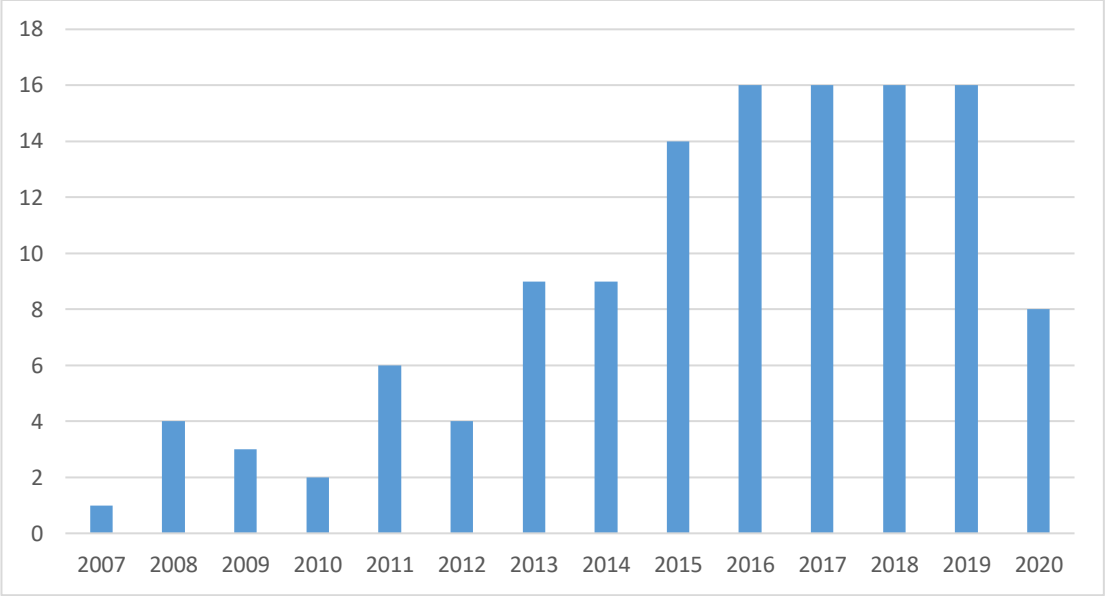

Fig 2. Distribution of papers by year on the data-driven approaches for customer-centric value proposition

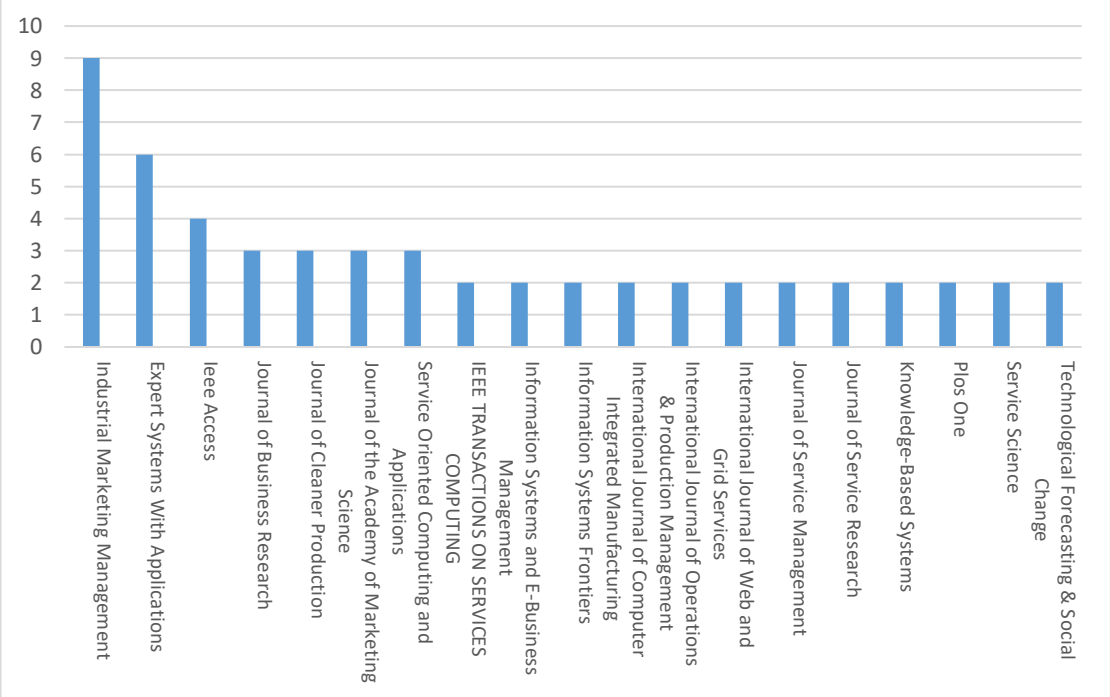

Fig 3. Distribution of the papers by the journals that have published at least two relevant papers since 2007 on the data-driven approaches on customer-centric value proposition

Regarding the research questions of the review, the evidence extracted is classified within the approaches that are used and the core concepts that are addressed; please see table 2. In the following of this section we first describe the approaches that are addressed by the reviewed papers. Then the core relevant concepts that are highlighted by these papers are investigated. Finally, the practical domains that data-driven approaches are applied to support customer-centric value propositions are described.

Table 2. Literature review classification

Approach	content			References
analytical models	Value co-creation domains			(Li and Liu, 2020)
	customer-centric resource integration	service recommendation	Intelligent and machine learning based service recommendation	(Wang et al., 2018c), (Gu and Guo, 2017), (Alexandrescu et al., 2017), (Vlachos et al., 2016), (Santos and Boticario, 2015), (Hussein et al., 2015), (Tan et al., 2014), (Kim and Ahn, 2008)
			Community oriented recommendations	(Shan et al., 2019), (Wang et al., 2018b), (Kaminskas et al., 2017), (Deng et al., 2017), (Li et al., 2015), (Wang and Wu, 2012)
			Experience oriented recommendations	(Yan et al., 2020), (Alam and Khusro, 2020), (Yuan and Yang, 2017), (Margaris and Vassilakis, 2017), (Lin et al., 2014), (Wang et al., 2013a), (Tan et al., 2013), (Wang et al., 2018a)
			Knowledge based recommendations	(Yin et al., 2016), (Wang et al., 2015), (Fong et al., 2011), (Brut et al., 2008), (Su et al., 2007), (Zhang et al., 2018)
		web service composition	Content-based	(Xie et al., 2019), (Xiong et al., 2018), (Afify et al., 2017), (Ba et al., 2016), (Yao et al., 2015b), (Fan et al., 2015)
			QoS-aware	(Guo et al., 2019), (Alghofaily and Ding, 2019), (Xiong et al., 2018), (Ren and Wang, 2018), (Zhang et al., 2017b), (Tian et al., 2017), (Su et al., 2017), (Afify et al., 2017), (Yu and Huang, 2016), (Xu et al., 2016), (Wang et al., 2016), (Ba et al., 2016), (Yao et al., 2015b), (Rong et al., 2015), (Liu et al., 2015), (Chen et al., 2014), (Zhang et al., 2013)
			Social-based	(Xie et al., 2019), (Zhang et al., 2017b), (Zhang et al., 2017a), (Yao et al., 2015a), (Rong et al., 2015), (Liu et al., 2015), (Maamar et al., 2011)
	customer-centric value characteristics			(Li and Liu, 2020), (Yan et al., 2020), (Lieder et al., 2020), (Anoop and Asharaf, 2020), (Lombardo and Cabiddu, 2017)
	SD platforms			(Jung and Chung, 2020), (Xing et al., 2013)
conceptual models	Value co-creation domains			(Mavridou et al., 2013), (Pires et al., 2015), (Akaka and Vargo, 2014), (Kuppelwieser et al., 2013), (Ballantyne et al., 2011), (Payne et al., 2008)
	customer-centric resource integration	service recommendation		(Katsarakis et al., 2014), (Jung and Chung, 2014), (Mavridou et al., 2013), (Vogiatzis et al., 2012), (Chan et al., 2011), (Lin, 2009)
		web service composition		(Sun et al., 2016), (Wang et al., 2013b), (Tserpes et al., 2012), (Wang et al., 2010), (Brohman et al., 2009)
	customer-centric value characteristics			(Carlson et al., 2019), (Kolyperas et al., 2019), (Hollebeek et al., 2019), (Hollebeek, 2019), (Wajid et al., 2019), (Singaraju et al., 2016), (Ple, 2016), (Frow et al., 2016), (Ekman et al., 2016), (Pires et al., 2015), (Oh et al., 2015), (Black and Gallan, 2015), (Akaka and Vargo, 2014), (Kuppelwieser et al., 2013), (Novicevic et al., 2011), (Ballantyne et al., 2011), (Payne et al., 2009), (Payne et al., 2008), (Viswanathan et al., 2018), (Kleber, 2018)
	value co-creation mechanism			(Mavridou et al., 2013), (Rihova et al., 2013)
	SD platforms			(Carlson et al., 2019), (Hollebeek, 2019), (Wang et al., 2013b), (Yu et al., 2019), (Zheng et al., 2018), (Skalen et al., 2018), (Singaraju et al., 2016), (Pezzotta et al., 2016), (Frow et al., 2016), (Ekman et al., 2016), (Black and Gallan, 2015), (Akaka and Vargo, 2014)

Table 2. Continued		
Approach	**content**	**References**
empirical approaches	Value co-creation domains	(Quero and Ventura, 2019), (Yu and Sangiorgi, 2018), (Martinez, 2014), (Truong et al., 2012), (Kristensson et al., 2008)
	customer-centric value characteristics	(Loo, 2020), (Kumar et al., 2019), (Grandhi et al., 2020), (Martinelli and Christopher, 2019), (Lei et al., 2019), (Yu and Sangiorgi, 2018), (Best et al., 2018), (Cheung et al., 2016), (Aitken and Paton, 2016), (Shirahada et al., 2015), (Martinez, 2014), (Moeller et al., 2013), (Truong et al., 2012), (Epp and Price, 2011), (Gebauer et al., 2010), (Kristensson et al., 2008), (Sukhu et al., 2018)
	value co-creation mechanism	(Quero and Ventura, 2019), (Heikka et al., 2018), (Carbone et al., 2017), (Camilleri and Neuhofer, 2017), (Kallstrom and Ekelund, 2016)
	SD platforms	(Loo, 2020), (Razmdoost et al., 2019), (Kumar et al., 2019), (Laakkonen et al., 2019), (Lofberg and Akesson, 2018), (Iriarte et al., 2018), (Resta et al., 2017), (de Oliveira and Cortimiglia, 2017), (Breidbach and Maglio, 2016), (Shirahada et al., 2015), (Cherubini et al., 2015), (Smith et al., 2014), (Chakkol et al., 2014)

3-1-Data-driven approaches to support customer-centric value propositions

The investigation of the explored papers shows that a variety range of approaches have been applied to facilitate using data to propose customer-centric and service dominant value, including analytical models by machine learning and mathematical methods, conceptual models in the form of information system architectures or conceptual procedures, and empirical approaches like case study, survey, and action research; please see figure 4.

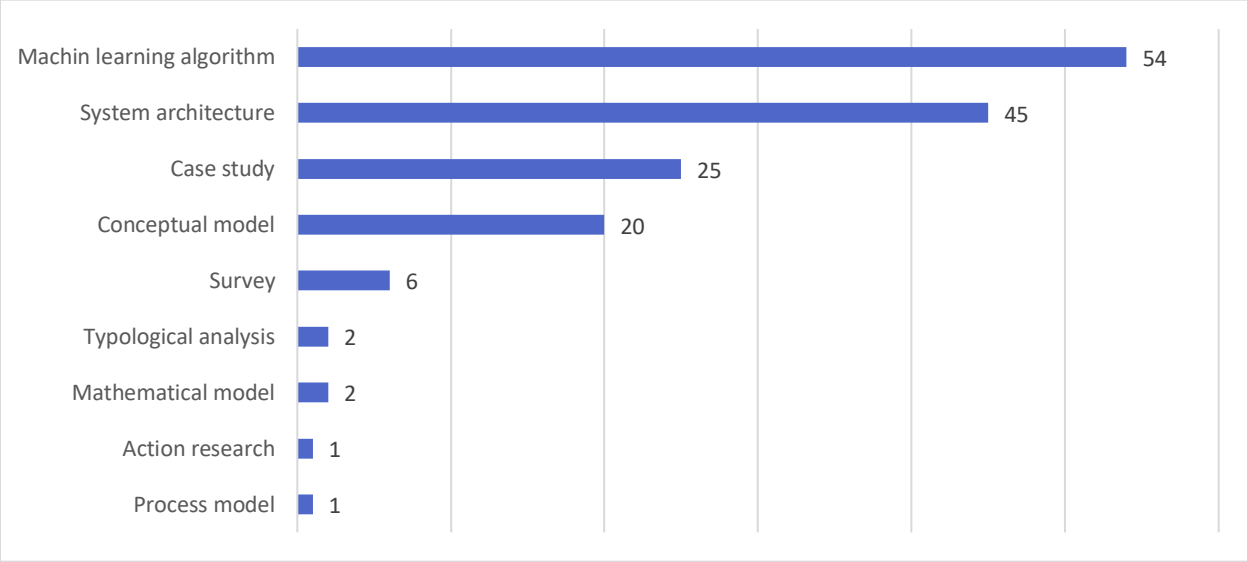

Fig 4. Analysis of articles approach

The approaches that are focused on data analytics have been mostly used within service recommendation systems as a technique to capture individual customer behavior. Data analytics methods are also used to predict and calculate user preferences and suggest customer-oriented products and services. These

approaches use both the supervised and non-supervised methods; please see figure 5 that presents the machine learning algorithms that are used in the analyzed articles. Clustering is the most adopted machine learning algorithm that is used in the examined literature. The main idea of these articles is to segment customers in an unsupervised way and then analyze the customer behavior of each segment. Within value co-creation processes, products/services and customers influence each other. Based on this characteristic, service dominant recommendation systems are highly used social network analysis approaches. According to the fact that the data analytics approaches mostly focus on recommendation system, 7% of them have used matrix factorization which is a type of collaborative filtering algorithm. In addition, the classification techniques e.g. Bayesian approach, decision tree, neural network and etc, are widely adopted as model-based approaches in recommendation systems.

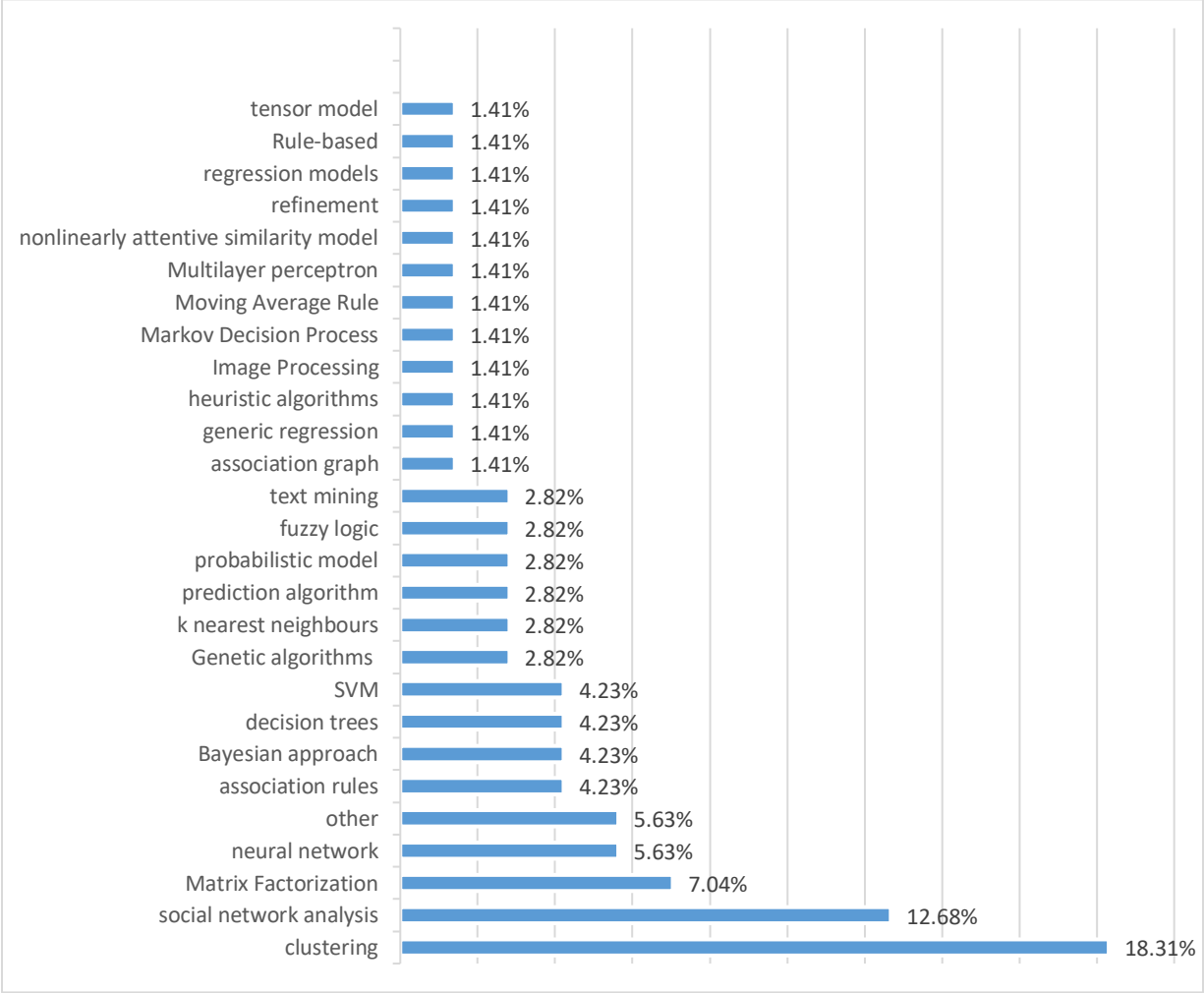

Fig 5. Analysis of machine learning algorithms that are used for customer-centric value propositions

Another class of the approaches that are used to facilitate using data opportunities in customer-centric value proposition includes conceptual procedures, system architectures, conceptual frameworks, typological analysis, and process models. This category takes into account the components of the service ecosystems and structure of that. Papers focusing on system architecture aim to propose architectures that describe the structure and behavior of a marketing system. Also, the papers that provide relevant conceptual

models are usually trying to develop models that show the relationships between variables, concepts, or components, and help to understand related subjects and topics.

Empirical researches mostly include papers that are inductive in nature. Given the fact that the topics covered in these articles are new, there are a limited number of theories and empirical evidence related to these topics. Approaches such as case study, survey, and action research are used to investigate real-life scenarios that are followed by organizations to propose customer-centric value. Case study is one of the widely adopted approaches among these papers. it is used to put an interpretation on complex problems that are faced within this domain.

3-2-Core concepts highlighted within customer-centric value propositions

This section points out the key concepts relating to the service dominant value proposition that are introduced within the reviewed papers. These concepts are classified within the five, including:

1) value co-creation domains
2) customer-centric resource integration
3) customer-centric value characteristics
4) value co-creation mechanism
5) service dominant platforms

The citations that each of these concepts are derived from each of the mentioned groups encompasses some subgroups that are described in the following of this section.

3-2-1-Value co-creation domains

This class refers to the different types of value co-creation domains that customers can be involved within a whole lifecycle of a product or service. The engagement of customers within these domains requires customer-centric value propositions that encourage them to interact with a service ecosystem. Regarding the reviewed papers, the identified value co-creation domains can be enumerated as:

- **Co-innovation:** co-innovation means that new ideas and approaches from individual participants in a service ecosystem are integrated to generate value for new product or service development (Lee et al., 2012, Martinez, 2014)
- **Co-design:** co-design is a design through collaboration between firms and consumers to ensure the results meet customer's needs.
- **Co-manufacturing:** this kind of co-creation refers to customer's physical interaction with manufacturers to production of tangible products or services during production processes.
- **Co-distribution:** Co-distribution refers to distribution mechanisms that support the involvement of actors within a service ecosystem within logistics processes through shared facilities like shared truck, shared warehouses, and shared inventories.
- **Co-marketing:** co-marketing addresses a marketing strategy where different actors including customers within a service ecosystem cooperate together by combining their resources, to expand their reach.

3-2-2-Customer-centric resource integration

Customer-oriented resource integration refers to the process through that actors in the service ecosystem, apply and share their resources to co-create value. Recommender systems as the main concept within this

category, acts as a resource integrator. These systems aim to gather customer's operant resources and integrates them with firm's operand and operant resources, and through this process, the customer obtains the value-in-use. Regarding the reviewed papers, two main concepts are identified within this category:

- **Service recommendation:** service recommendation is a kind of system that based on the user's profile of preference and transactional dataset, utilizes techniques that attempt to suggest items which are likely to be the interest of the user. We classified this group of articles within four subgroups presented in table 3.

Table 3. Service recommendation categories to enhance service dominant value propositions

Group	Description
Intelligent and machine learning based service recommendation	Recommendation utilizing a machine learning technique, and artificial intelligence.
Community oriented recommendations	Recommendation on the basis of reactions and preferences of similar users.
Experience oriented recommendations	Recommender systems that are based on IoT enabled user sensing, and user preferences.
Knowledge based recommendations	Recommendation based on knowledge about users and products utilizing technology like ontology-based modeling, topic model, and etc.

- **web service composition:** to fulfill user's functional and nonfunctional requirements, a single web service isn't enough. To this end, web service composition puts together multiple services to satisfy user's demand. We can categorize the service composition related concepts within three groups (Xie et al., 2019) that include content-based, QoS-based, and social-based service composition. These groups are introduced in table 4.

Table 4. web service composition categories to support customer-centric resource integration

Group	Description
Content-based	Estimate functional similarities between the content of web services and user's query
QoS-aware	Compare the quality of services i.e. time, cost, and etc. With users' nonfunctional requirements
Social-based	Analyze relationships network of web services, and user's query

3-2-3-Customer-centric value characteristics

It is a core principle in the service dominant logic of marketing that customers are in forefront of the company's decisions, and customer expectations, needs and wants are the starting point for the production and delivery of goods and services. Regarding the reviewed paper, the core concepts that address this core principle are classified as follow:

- **Customer Experience:** customer experience states how customer perceives the value that is offered by the service provider. Comprehensive perception of customer experiences can contribute to recommendations of the value proposition that meet the needs of consumers (Yu and Sangiorgi, 2018, Epp and Price, 2011).
- **Customer Engagement:** regarding the service dominant logic of marketing, the customer is always a co-creator of value. Customer engagement refers to interaction among service provider and customer/consumer beyond transactions, resulting from motivational drivers which can be happened online or offline (Brodie et al., 2011, Van Doorn et al., 2010). Engaged customers can have a role in

value creation, and product development process by suggesting innovative ideas for products and services (Martinez, 2014) (Kristensson et al., 2008).

- **Value-in-Use/ Value-in-Context:** In service dominate logic perspective, value-in-use points out the fact that value is co-created by the users as an active participant during usage, which is a fundamental concept to emphasize the value created by customers. Likewise, value-in-context is extended of value-in-use which suggests that value is viewed as the process of resource integration that customers integrate resources from providers and other actors in the context of customer's goals and experience (Vargo et al., 2008) (Ple, 2016).

3-2-4-Value co-creation mechanisms

This class of relevant concepts addresses the strategies to attract customers to co-create value in order to meet customers' personal needs and gain a competitive advantage. Based on the reviewed papers, these concepts are classified as follows:

- **Customer-centric Match Making:** match making is a mechanism through which the service providers can match their value propositions with various individual customers' needs (Heikka et al., 2018).
- **Crowdsourcing:** crowdsourcing is a business model that refers to obtain services, ideas, or contents through assigning some activities to a group of participants (Brabham, 2008) (Carbone et al., 2017).
- **Sharing Economy:** temporary use and sharing of resources with the help of new technology through convenience and lower prices is known as sharing economy (Carbone et al., 2017, Camilleri and Neuhofer, 2017).
- **Mass Customization:** mass customization refers to provide products and services that meet individual customers' needs on the large scale at a mass production price (Mavridou et al., 2013). In the context of production, this concept is facilitated through engineering to order and postponement strategy.
- **Place Marketing:** place marketing aims to utilize marketing tools to picture a place e.g. cities, communities, areas, and etc; to achieve multiple goals, such as to build a positive image for the place and attract enterprises, tourists, institutions, events, etc (Rainisto, 2003) (Kallstrom and Ekelund, 2016).

3-2-5-Service Dominant platforms

Service dominant platforms provide facilitations that are usually supported by IT-enabled solutions in order to enhance interactions among service ecosystem. The key concepts that are highlighted by the reviewed papers to describe service dominant platforms are discussed in the following of this sub-section:

- **Value networks/ service ecosystems:** the service ecosystem is a systemic view that is defined as ''relatively self-contained self-adjusting systems of resource integrating actors connected by shared institutional logics and mutual value creation through service exchange'' (Vargo and Lusch, 2016). The service ecosystem stresses that value co-creation occurs through resource integration process during practices between actors linked together in a network of relationships by value propositions (Vargo et al., 2020, Razmdoost et al., 2019, Frow et al., 2016, Rasouli et al., 2019).
- **PSS platforms:** a product service system can be defined as a system of both products and services to generate superior customer exchange value and thus enhance competitive edge (Smith et al., 2014).

Product service systems can be classified within product-oriented services, use-oriented services, and result-oriented services (Resta et al., 2017, Smith et al., 2014).

- **Omni Channel networks:** considering various firms' distribution channels, the omni-channel concept refers to synergetic management for coordinating and integrating the fragmented service processes in numerous available channels to improve customer experience (Kumar et al., 2019, Yrjola et al., 2018). This enables customer to easily move from one channel to another, as well as use multiple channels simultaneously, which increases the probability of a purchase.
- **Multisided platforms:** multisided platforms are technologies, products, or services that support direct interactions between customers from demand side and supply side while minimizing transaction costs and produce value for each side (Hagiu, 2015). There are two types of network effects (Abdelkafi et al., 2019): same-side or direct network effects, when users from one side contribute to more users joining the network on the same side; and indirect or cross-side network effect, when users from one side attract another side users.

3-3-Key practical domains of customer-centric value propositions

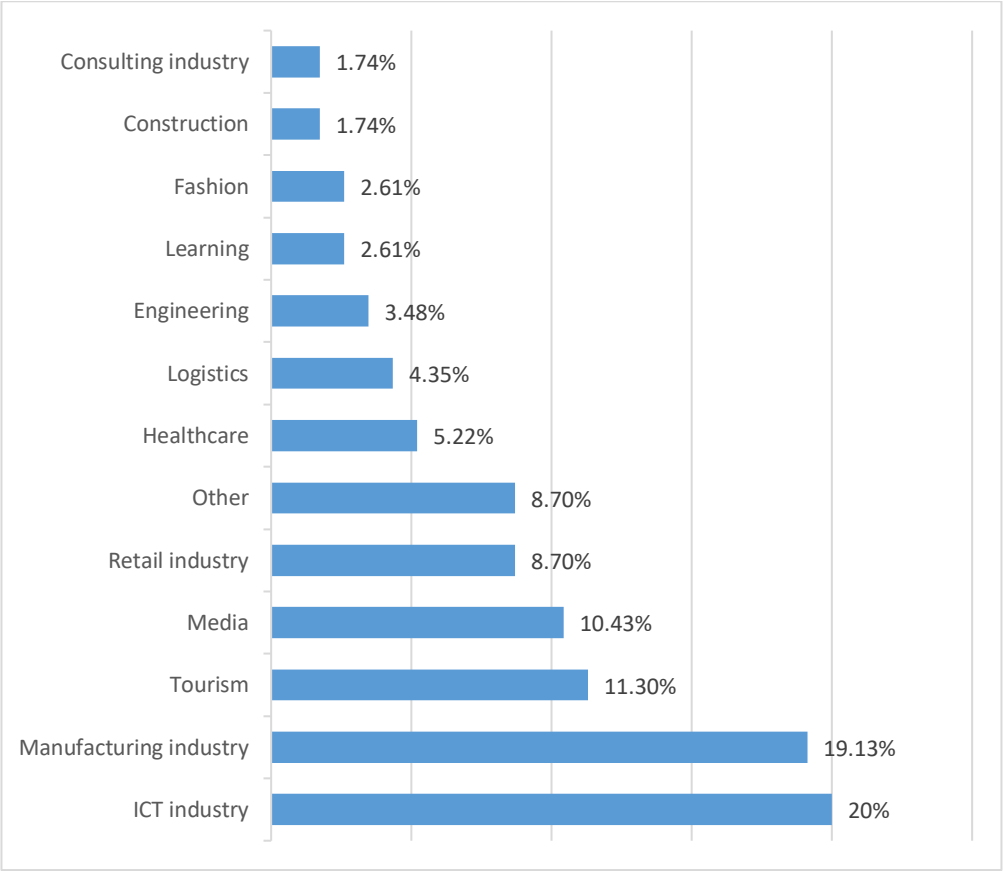

Fig 6. Analysis of articles context

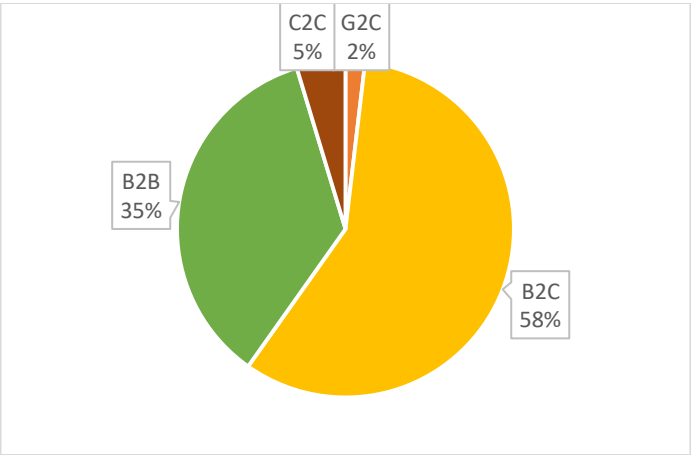

Fig 7. Analysis of articles business type

The investigation of the reviewed papers clearly shows that service dominant and customer-centric value proposition by using data driven approaches have applied within various contexts; please see figure 6. The first industry that has mainly been focused to provide highly customized products and services is the ICT industry, in which different interoperability technologies have facilitated co-innovating, co-designing, co-developing, and co-marketing of different software solutions in the form of customizable web services compositions. The emergence of new manufacturing paradigms like networked and cloud manufacturing has facilitated service orientation within this concept.

Regarding the nature of the tourism industry, which co-creating user-oriented experience for customers is known as an important competitive capability, a considerable number of the reviewed studies have focused on this practical context. The continuous and frequent interaction with customers has been facilitated by different marketing channels in the retail industries. This facilitation has resulted in the application of different data analytics tools to investigate customer behavior through data-driven algorithms and propose highly-customized integrated solutions for them.

The investigation of the results from the type of interactions among collaborating parties within co-creation scenarios shows that B2C interaction is highly considered by the reviewed research studies; please see figure 7. This means that most of the previous studies have focused on analyzing final customers' behaviors to propose service dominant products and services. Although B2B interactions seem to be more important to form service dominant platforms, there is less attention on this type of interaction in the related literature. In addition, while the growing trend of shifting business models to C2C interactions, only five percent of the investigated studies have addressed the nature of this type of interaction within customer-centric value propositions.

4-Discussion

Regarding the results of the review, data-driven analytical approaches that have been used by previous studies are mainly focused on the behavior analysis, segmentation, and prediction. While customer behaviors within co-creation scenarios are highly uncertain. In this way, it seems that the application of uncertainty oriented approaches that encounter noises on data would be a good possibility to develop new analytical approaches within this domain. Also emerging adaptive real-time machine learning methods that are able to take into consideration continuous data on customer behaviors within value co-creation scenarios can provide incredible possibilities to realize service dominant marketing concepts in reality. In addition, reinforcement learning approaches, which make it possible to adapt value propositions with customer perceived value during usage of products and services can extend traditional recommendation logics towards value in use co-creation paradigm. Meanwhile, the application of agent based simulation approaches that enable intelligent marketing systems to investigate complex interactive behavior of parties within service ecosystems can enhance the reviewed analytical methods to be proved within real-life

scenarios. Considering the reviewed concepts, customer engagement can be seen as a core capability that customer-centric service ecosystems need to realize. The application of social networks analysis methods can enhance the investigation of parties that collaborate to co-create value based on social interactions. The identification of social characteristics of collaborating parties as analytical attributes can support usual machine learning methods to consider community oriented aspects of customers' behavior in co-creation scenarios. While previous studies have used text mining and sentiment analysis methods to support value propositions in good-dominant logic of marketing, the development of new approaches that enable intelligent marketing systems to analyze customer agility within the usage of products and services has not yet received sufficient attention.

The investigation of the reviewed papers declares that most of the research studies on service ecosystem platforms conduct conceptual methods to identify key components of service dominant and customer-centric intelligent marketing systems and their relationships. Although these studies clearly address customer data warehouses to support different analytical approaches, the governance of social data gathered on these data warehouses is a big challenge yet. In addition, the development of policies to ensure the privacy of customers within service ecosystems and balancing these policies with the data requirements of customer-centric value propositions is a relevant direction for future research.

As shown in figure 6, most of the selected articles focus on the manufacturing industry context. Manufactories modify their value propositions to fulfill customer demands and discriminate their value propositions from competitors. Hence, firms' business models shift from product-oriented to service-oriented known as servitization. By drawing on product service systems and servitization concepts, manufacturers aim to propose value added-service rather than tangible products. From a value co-creation viewpoint, manufacturers focus on interaction with customers, to enhance customer's perceived value through value co-creation domains including; co-design, co-production, co-innovation, and etc.

Value co-creation gains increasingly attraction in ICT, tourism, and retail industries. The selected articles in these sectors mostly focused on customer experience theory and how they perceive the recommended value proposition. Within the health care service ecosystem, scholars described the resource integration process and how a firm's value proposition can lead to patients' engagement in knowledge sharing during co-creation. Also, the researches revealed that co-creation in the education context can effectively improve learner participation and learning experience. Customer behavior theory is one of the most studied area in these fields; which is closely linked to the customers' motivation, decision making, and trust in the service. In addition, in these contexts, IT facilitates value co-creation; Web-enabled interaction enables the co-creation through sharing the knowledge and information of all actors in the service ecosystem. due to the functionality of IT, the way value is generated has changed by the advent of new business models such as multisided platforms, crowdsourcing, smart PSS (Zheng et al., 2018, de Oliveira and Cortimiglia, 2017).

5-Conclusion

In this study, a systematic literature review was conducted to investigate the data-driven approaches that have been developed to enhance customer-centric value propositions. Also, the relevant concepts and the practical domains of these approaches were described. The core contribution of this research is to provide a comprehensive view of the knowledge that has been developed to exploit data-driven approaches that can enhance emerging marketing paradigms through service dominant and customer-centric value propositions. In this way, the paper incorporates ontological, epistemological, and pragmatic aspects of the knowledge on the customer-centric value proposition domain. The paper aims to systematically bridge between prescriptive approaches and tools that have emerged in the field of data analytics and descriptive concepts that have been introduced by novel marketing theories.

A limitation of this study is that we only analyzed co-creation concepts from the marketing perspective. it is worthwhile to consider other perspectives e.g. service science, service design and innovation, technology. The findings discussed above suggest some future directions, including:

1. Sensor-based and IoT devices provide valuable data, which open up the opportunity to predict customer behavior, and identify customer value in real-time, that enables the firm to offer a dynamic value proposition.
2. Nowadays, the impact of social media on business is constantly rising; user generated content related to products and services are shared on social media by consumers. Companies can utilize this space to engage customers in co-marketing activities such as viral marketing, word of mouth, and etc.
3. Ongoing advances in machine learning, allows companies to offer target service in accordance with customer value in real time and provide dynamic customer engagement.
4. Gamification strategy can be used as a creative method to motivate customer engagement in the value co-creation process, besides that through gamified services, firms can collect useful information about customer behavior as well as experience.

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