Repositório ISCTE-IUL

Internet of Things and Consumer Engagement on retail: State-of-the-art and Future Directions

Abstract:

Purpose – The growing complexity of consumer engagement (CE) due to the impact of internet of things (IoT) has been attracting significant attention from both academics and industry practitioners especially in recent times. Hence, understanding this phenomenal remains very crucial to the body of knowledge. This study conducted a systematic review on IoT and CE with the aim of proposing future research opportunities using the TCCM model.

Design/methodology/approach – Extant literatures were systematically examined by sourcing high ranking ABS journals from EBSCO, ScienceDirect and Emerald. A total of 58 articles were included in the final analysis of this research.

Findings – The analysis established the need to conduct more research on consumer engagement due to the impact of new technological implementation in retail. The results further suggest the need for extensive research across African countries and emerging markets to enable broader empirical generalizations of research outcomes. Using the TCCM framework, we indicated directions for future empirical research.

Originality/value – This study exposes the current trends in consumer engagement and internet of things. The results and analysis are both compelling and verifiable, hence, establishing a firm base of reference for future research in related fields.

Keywords - Internet of Things (IoT), Consumer Engagement, Consumer Behavior, New Technologies, Consumer Retention

1.Introduction

The concept of Internet of Things (IoT hereafter) has attracted a lot of attention, largely attributed to its importance due to its considerable internalization in our daily lives (Kotb et al., 2020). Its evolution in the retail space has been very intense due to its dynamic nature and further escalated thanks to the recent global pandemic (Kotb and Adel, 2020). Academic practitioners in recent times have highlighted several outlooks on the concept of IoT especially as it relates new technologies, virtual reality, augmented reality, internet of things, artificial intelligence, robotics, drones, and autonomous driving (Pillai et al., 2020; Novak and Hoffman, 2019; Kamble et al., 2019). Now, the concept of IoT is regarded as one of the highly rated technological and strategic innovations that are expected to create new business opportunities in the future (Fagerstrøm et al., 2020). IoT expands the omnipresence of the internet by incorporating interactions via embedded technologies with the aid of highly distributed networking devices, while communicating with humans (Woodside and Sood, 2017). The advancement in technology is also contributing to the diverse ways IoT improves lives through different application areas (Xia, Yang, Wang, and Vine, 2012).

Consumer engagement (CE hereafter), on the other hand, has attracted considerable attention due to the dynamism in the academic, retail, business (Pansari and Kumar 2017; Baldus, Voorhees, and Calantone, 2015; Brodie, Ilic, Juric, and Hollebeek, 2013; Bilro and Loureiro, 2020; Rosado-Pinto and Loureiro, 2020) and practitioners' landscape (Dessart et al., 2016). With the advent of IoT, there has been significant shift from human-to-human interactions to human-to-machine or machine-to-machine interactions (Bulmer et al., 2018; Cebeci et al., 2020; Wang et al., 2012). While some researchers identified that the best consumer experience can be generated through the combination of human and technology-based services (Parasuraman et al., 2005;

Reinders et al., 2008, 2015), others call for future studies to empirically examine the implications of IoT for an improved CE (Nguyen and Simkin, 2017).

Hoyer et al. (2020) and Rust (2020) have also recently identified the need for further conduct empirical research to evaluate IoT and CE with retailers, service providers, and brands considering interactions between machine-to-machine vis-à-vis human-to-human relationships in retail marketing. Recent reviews in marketing field presented by Valdez Cervantes, and Franco (2020) analyzed retailing technology and the effects on shoppers' perceptions. Nguyen et al. (2018) also focused on consumer behavior and order fulfilment in online retailing. Further, academic research suggests that the phenomenon of CE co-creates services and influences consumer behavior (Deighton and Kornfeld, 2009). Our primary aim in this current paper is to conduct a systematic analysis on IoT and CE, focusing on proposing future research opportunities using the TCCM model.

We intend to achieve this by i) conducting a critical overview of extant research on this topic; b) synthesizing our findings into an integrative and multi-disciplinary framework and c) highlighting some congruence and inconsistencies in previous studies and identify directions for future research. This study contributes to the body of knowledge by providing a better understanding on the relationship between IoT and CE and their importance for practitioners. This detailed and systematic review took into consideration recent publications in this field, as well as current development in the industry. Through this review, we are also able to provide better transparency for future research and by identifying contextual gaps.

The subsequent section of this paper is followed by a definition of IoT and CE to enhance concept clarity. Next, we present a thorough understanding of the systematic review methodology for this research. This is shortly proceeded by an analysis of extant research. Following a structured

categorization of our findings we propose an integrative framework for positioning and informing future research agendas on IoT and CE before concluding the paper with limitations and directions for further study.

2.Methodology

IoT as a concept was first published by Kevin Ashton in 2009, where he described it as "adding radio frequency identification and other sensors to everyday objects" (Ashton, 2009: 1). This is a technology that enables spread of embedded network of intelligent and autonomous devices with the intention of scaling productivity, profitability, and efficiency through the usage of big data (Kamble et al., 2018b). IoT is considered as "an open and comprehensive network of intelligent objects that have the capacity to auto-organize, share information, data and resources, reacting and acting in case of situations and changes in the environment" (Madakam et al., 2015: 165).

CE is regarded by practitioners as "repeated interactions that strengthen the emotional, psychological or physical investment a customer has in a brand" (Sedley 2010: 7). Academics view it as "intensity of customer participation with both representatives of the organization and with other customers in a collaborative knowledge exchange process" (Wagner and Majchrzak 2007: 20). Thus, it is the mechanism for value creation that improves the development of customer relationships (Brodie et al., 2013). Brodie, Hollebeek, Juric, and Ilic (2011; 260) refer to CE as 'a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent/object (e.g., a brand) in focal service relationships. CE centers on specific interactive consumer experiences. Based on the above analysis (Vivek et al., 2012) suggest that CE as a central concept within the marketing system. To unify this approach, we adopted a systematic review

methodology with the aim of identifying a comprehensive overview, identifying research gaps and future research direction (Denyer et al., 2008; Macpherson and Jones, 2010; Tranfield et al., 2003). The systematic review process entails a methodological and comprehensive review of clearly identifying, selecting, and appraising relevant research with an evaluation of findings for the study under review (De Menezes and Kelliher, 2011). The approach embodies a rigorous, transparent, and replicable manner which leads to a holistic conclusion of discoveries of the topic under review (Tranfield, Denyer, and Smart, 2003; Denyer and Tranfield, 2009; Atewologun et al., 2017; Christofi, Leonidou, and Vrontis, 2017). This method applies a multiplicative and systematic procedure which eliminates bias based on rigorous literatures searches (Tranfield et al., 2003). All associated procedures and meta-analysis developed over the years currently plays an important role in evidence-based practices (Tranfield et al., 2003).

The method is echoed to have several upsides over other traditional narratives and reviews, which primarily includes provision of collective insights through theoretical synthesis of findings, improving the rigorousness of the research and authenticates the reliability of the research (Tranfield et al., 2003; Macpherson and Holt, 2007). This method is applied as being fully transparent and highly replicable from an academic point of view (Tranfield et al., 2003; Crossan and Apaydin, 2010). For industry experts, this is a strong source of knowledge to generate reliable bank of information based on the assemblage of intelligence from the conducted studies. For practitioners, this method helps generate a reliable understanding station by the assemblage of knowledge from organization of studies. Hence, we consider the systematic review as the most soothing method to achieve holistic well-rounded research on IoT and CE.

3.Search protocol

3.1 Question formulation

One of the criteria for a successful systematic literature review is built on the premise of a clear research question at the commencement of the review process (Nguyen et al., 2018). We took into consideration the interface between IoT and CE in retail in our review (McCausland, 2021). Guided by academic and industry practitioners, we choose to focus on these research questions: 1) How does IoT and new technologies influence consumer engagement in retailing sector? and 2) How does IoT and new technologies influence customer experience and customer emotions?

3.2 Inclusion criteria

Following Nguyen et al., (2018), we adopted similar techniques by locating references to ensure all available resources are taking into consideration. Electronic databases, peer review journals and applied snowballing methods were used. We restricted our electronic database search to EBSCO, ScienceDirect and Emerald and offline research restricted both to scholarly peer-reviewed articles and to the fields of marketing. The choice of these database was based on their large coverage and frequency of usage for conducting high quality systematic review. We used Google Scholar to identify further studies (Blut and Wang, 2020). To avoid missing any relevant literature, we decided not to limit the coverage period but opening it up until August 2021 which was the stop point of this study (Vrontis and Christofi, 2021).

3.3 Search strategy

We commenced our search strategy by evaluating the title and abstract of the database in use (Wang and Chugh 2014). In line with Müller-Seitz (2012), we generated a list of keywords with a broad coverage. We defined our search parameter into internet of things and consumer engagement in retail. The search terms identified were the prevalent terms utilized in the literature to capture internet of things and consumer engagements in retail sector. We also used truncation to highlight

all relevant literatures that had similar search terms (Dada, 2018). We went as far as using the abbreviations of each of these search terms such as IoT and CE. We adopted the parameters as adopted by (Vrontis and Christofi, 2021) by using the group strings associated with Boolean and Operator to develop a combined search string. We finally used the search formular of internet of things (OR IoT) AND consumer engagement in retail (OR CE). We generated a total of 3835 articles in total in our initial search results.

We adopted the search criteria detailed in Keupp and Gassmann (2009), Keupp et al. (2012), by focusing on journals with high impact factors which buttresses the qualities of the articles. IoT and CE literatures Social Science Citation Index-listed journals with an annual impact factor of at least 1.0 was considered while journals with lower impact factors were excluded from our review. This review can be regarded as a good representation of accumulated knowledge on the topic of IoT and CE within the period under review.

3.4 Exclusion criteria

We subjected the above data into further scrutiny to have focus on selected articles. We commenced by deleting duplicated literatures generated across different database. Secondly, we limited our studies to only peer-reviewed academic journal that had full text ranked 2 - 4* in the Association of Business Schools (ABS) ranking 2021 based on quality of research in top tier ABS raking journals Atewologun et al. (2017), Nguyen et al., (2018). We also watched out for previously published systematic reviews published in top-ranked and high impact reviews (e.g., Atewologun et al., 2017; Franco-Santos and Otley, 2018). Thirdly, we choose to review only literatures published in English despite, we believe it is justified to focus on common scientific knowledge base which the English language largely represent in the scientific field Follmer and Jones, (2018). Furthermore, articles not based on IoT and CE, which is the pivot of this study,

were excluded (e.g., they include articles on retail algorithm, search regrets, chat group characteristics). Articles with only reference to IoT but without focus on CE were also excluded. Then, we further excluded articles with contents that were not applicable to this current study despite their search terms being present, however, from further review, we realized the discussions were not centered under topic under discuss. We finally arrived at a sample of 112 articles after applying all these exclusion criteria for this systematic review.

3.5 Selecting relevant studies

After the applying the inclusion and exclusion criteria as referenced by Müller-Seitz (2012), Kauppi et al. (2018) and Vrontis and Christofi (2021), we succeeded in limiting the literatures to 112. After the first rounds of review which consisted mainly of understudying the titles of the articles, examining the abstract and full text in some cases, at this stage, we were inclusive, general, and focused less on whether the article was focusing on the topic or not. Our objective here was to identify all relevant literatures that could discuss this topic. Hence, we only considered articles that improved the understanding of IoT and CE in this context yet included those in which the focus was on another topic, but that still shed light on the phenomenon in question. At the end of this exercise, we arrived at 93 articles.

At the second review stage, we adopted to read all the outstanding articles and implemented the coding method of Kauppi et al. (2013), by labelling all articles independently as green (accepted), yellow (possibly accepted) or red (rejected) − codes were then compared to check for inconsistencies. After the second review, we arrived at 76 relevant articles for the literature analysis.

We further consulted google scholar to identify any possible literature not currently considered under our review (Dada, 2018) to ensure we had considered all relevant literatures.

Additionally, we manually searched through references of some selected literatures, as well as consulted academic experts to advise on relevant literatures for the purpose of having a thorough and representative study (Weibler, 2017; Nofal et al., 2018). After applying the parameters of the inclusive, exclusive, and quality criteria against all additional literatures, we arrived at a total of 58 articles for this review. Figure 1 shows review process in stages.

INSERT FIGURE 1 ABOUT HERE

3.6 Extraction, analysis, and synthesis

Due to the high acceptance rate of content analysis as a powerful data reduction technique (Prasad 2008; Stemler 2001) for analyzing large bodies of text in academic reviews (Cetindamar et al., 2009, Germain and Cummings 2010; Sirola-Karvinen and Hyrkäs 2006), we decided to adopt this approach to be consistent with previous researchers. Data extraction form was used to properly structure and document technical characteristics of each reviewed papers (e.g., type of paper, authors details, sample size, data collection). Subsequently, with the information retrieved through the data extraction form, we focused the rest of this review to detailing the findings from the systematic analysis (Nguyen et al., 2018). Thus, section 4 is dedicated to the descriptive review of the literature and section 5 adopts the TCCM framework to explore the theoretical foundations, structure the gap analysis and propose future research directions.

4. Descriptive review of the literature

After reviewing the literature falling under the predefined parameters, we identified trends that are relevant to the impact of IoT on CE. This section is dedicated to reporting the findings which are structured based on topics like methods, research areas and recency among others. This will serve as a guide to gap identification for future research.

4.1 Year of publication, type of paper and methods employed

Table 1 shows an overview of selected articles in chronological order. This reflects relevant studies undertaken on this topic in the past 21 years (2000-2021). There was a noticeable increase in the numbers of publication in 2002, that is, 7% (n=4), which was triggered by researchers' prediction on changes in the retail landscape in the next 10 years, with consumer expectations uncertain due to the innovations in the retail industry (Wood, 2002). There was also the need to understanding the requirements of satisfying consumer experience due to the introduction of e-retailing (Szymanski and Hise, 2000). Additionally, we identified a further acceleration in the numbers of publications in the last 6 years (2016 and 2021), which accounted for 74% (n=43) of the total publication under review. This is an indication of the transformation in the retail industry spurred by digitalization and IoT and a constant change in consumer requirements (Bhatti et al., 2020).

INSERT TABLE 1 ABOUT HERE

Figure 2 further reflects the distribution of the publication according to the type of studies conducted. Empirical reviews accounted for the largest share of 57% (n=33) followed by conceptual analysis 21% (n=12%). Meta-analysis and systematic reviews have been conducted in the past on similar subject (Blut and Wang, 2020; Lamberton and Stephen, 2016). In our research they accounted for a total of 4% (n=2 that is, one each).

INSERT FIGURE 2 ABOUT HERE

With reference to the methods used for our studies (Table 2), quantitative methods accounted for the highest share of 36% (n=21), qualitative methods assumed 28% (n=16), while mixed methods were only 7% (n=4). Though the percentage of quantitative research was the largest, the share of descriptive and conceptual reviews from this analysis was quite significant. This also echoes the position of previous researchers to further expand more research in this

direction (Pantano and Gandini, 2017; Pantano and Verteramo 2017; Nguyen and Simkin, 2017). Table 3 elucidates widely used methods according to the authors.

INSERT TABLE 2 AND 3 ABOUT HERE

4.2 Journal outlets, fields of research and citation impact

As part of the exclusion criteria, our focus was to identify journals with highly regarded and relevant content in the fields of retailing, marketing, and consumer research. Hence, we referenced high ranking ABS journals which includes (Table 2) International Journal of Research in Marketing, Journal of Consumer Research, Journal of Marketing and Marketing Management, Journal of Retailing, Journal of Retailing and Consumer Science and Journal of Academy of Marketing Science. Most of the articles that have published related subjects on this topic have been referenced majorly from the Journals of Retailing 28% (n=16) and Journal of Marketing Management 17% (n=9).

INSERT TABLE 4 ABOUT HERE

4.3 Geographic analysis of authorship origin and study locations

As evidenced from Table 5, there is a strong collaboration from scholars across different geographical orientation and location. We also discovered at least three or more authors, 45% (n=26), jointly partnered to come up with their reviews. This indicates similarities in the research field.

INSERT TABLE 5 ABOUT HERE

A total of 158 authors contributed to the reviewed literatures, of which authors from the U.S.A. and China contributing 27% each (n=8) (Figure 3). From our review of extent literature, we could validate a representative geographic coverage area, as we had a total of 25 countries

included in this study. Contributions from authors in the U.S.A. accounted for 33% (n=31), followed by UK 13% (n=11) and China 8 (n=9%). From a regional point of view, studies from 4 continents were observed, that is, North America 35% (n=47), Europe 27% (n=26), Asia 18% (n=13), and Australia 7% (n=5). It was observed that studies from Africa were not included, which also presents a research gap that needs to be identified, especially as the rate of development in this continent is rapid especially in some countries.

This finding corroborates the discoveries and call for future research from other authors including Sharma et al. (2020). Only one cross regional/country specific study between Australia and USA (Sharma et al., 2020) was sighted, there has been more craving from researchers to conduct more empirical studies to better compare findings and generalize research outcomes between developed and emerging countries, and countries with different cultural orientations (Fagerstrøm et al., 2020; Gupta et al., 2018).

INSERT FIGURE 3 ABOUT HERE

5.TCCM analysis

In this section we adopt the TCCM framework (Knight et al. 2004; Paul and Rosado-Serrano 2019), which helps to further understand the status of the literature, to spot the gaps from previous studies and to offer directions for future studies. (T) stands for theory, (C) for context, (C) for characteristics and (M) for methodology. This framework is aimed at structuring our findings and gap analysis for future research directions and is presented on Tables, 6, 7 and Table 8.

5.1 Theory development (T)

A detailed overview of the different theories used in the articles are depicted in Table 6 and Table 7, with the later offering a perspective of frequency. Interestingly, most of the articles analyzed

(61%; n=38) do not clearly point out any theory foundation to support the research. Among remaining ones, the most often used theory was the Technology Acceptance Model (TAM) (10%; n=6). This finding is consistent with previous studies that confirm TAM is the most popular methodology for appraising consumer acceptance intentions (Shin et al., 2018), with perceived usefulness and perceived ease of use being most often used to explain acceptance intentions (Davis 1989). Attitude is also often present in the TAM studies analyzed and, in some studies, it accounts for negative correlation with intentions (Yousafzai et al. ,2007 a, b). This finding is consistent with Swilley (2010), where attitude was pointed out as an antecedent of technology rejection in the context of wallet phone. Moreover, security and privacy concerns have also been evaluated as additional barriers that inhibits the adoption of new technologies (Malhotra, Melville, and Watson, 2013; CecezB Kecmanovic, Galliers, Henfridsson, Newell, and Vidgen, 2014)

The topic of consumer engagement within IoT was explored by means of different theories. For instance, Yang (2010) combined the unified theory of acceptance and use of technology (UTAUT) to determine driving factors of consumer behavioral intention to use mobile shopping services. Using the four constructs (i.e., performance expectancy, effort expectancy, social influences, and facilitating conditions), the researchers concluded that the ease of using mobile shopping services is not a major driving factor of attitude and behavioral intention in the usage of mobile shopping services. Applying the theories of consumer acceptance of technology (CAT) and technology acceptance model (TAM), Kulviwat et al. (2013) tried to provide a framework to understand how external factors influence acceptance or rejection of new technology, building on the central idea of self-efficacy theory – which is based on the assumption that personal beliefs are the basis for the actions (Barling and Beattie, 1983), findings indicate that individuals with high self-efficacy are more open to adopt technological innovations than others (Ellen et al., 1991).

Thus, the consumer has their own abilities to understand and effectively use the new technology and to further influence others to use them (Kulviwat et al., 2013).. Subsequently, the theories of planned behavior (TPB) (Blut and Wang, 2020), and quality–value–satisfaction (QVS) (Arora and Sahney, 2018) have also been applied to provide different perspectives to technological readiness and adoption under different context. Given the insights generated through the combination of different theories, we can argue that certain external factors (e.g., technology experience, system experience, playability) play a crucial role on consumers accepting or rejecting the adoption of new technologies (Kulviwat et al., 2013). The process of evaluating the impact of technologies on consumer engagement can increase the skepticism and distrust attributed to the perceived higher risks of usage compared with benefit (Blut and Wang, 2020).

The analysis of articles allows to conclude that the current state of the art does not account for theories that juxtaposes consumer satisfaction and commitment – through the usage of new technology and the subjective evaluation of the quality of alternatives (Brehm 1985) – and the relationship investment model (Rusbult, 1980). The investment model suggests three primary predictors of brand commitment and engagement: satisfaction with the relationship, alternatives to the relationship and investments in the relationship (Sung and Campbell, 2009). The investment model is an important theory of studies outside the scope of technology and as such could offer sound theoretical ground.

Furthermore, the social exchange theory (Hollebeek, et al., 2016) was highly limited in application at only 2% (n=1). As a key engagement theory, it explains the perceived personal value and personal investment required when engaging with new technologies (Hollebeek et al., 2016). The perceived value of engagement is important, since a consumer is more likely to continue their relationship if the interaction is considered valuable (Brodie et al., 2013; Viswanathan et al., 2017).

In sum, despite the considerable applicability and validity attributed to TAM (Alenezi, Abdul Karim and Vello, 2010), we need new theoretical foundations that could further explain this phenomenal from different perspectives, focusing on engagement and social aspect of consumer-brand relationship while adopting new technologies.

INSERT TABLE 6 ABOUT HERE

5.2 Context (C)

Research in CE and IoT has resulted in the advancement of the knowledge by identifying various features, including relevant characteristics, antecedents, and outcomes. However, the existing research is fragmented and diverse, so few consistent and definitive conclusions can be drawn. The challenge associated with this field is that with several studies highlighting the effect of IoT on marketing strategies and consumer behavior (Capatina et al., 2020; Davenport and Kalakota, 2019; Ting et al., 2019), gaps still exist. Such gaps include the need for research on consumer engagement in the context of smart service systems, in which more than two actors are involved, for instance customers and employees. The reason lies in the suggestions from researchers that a platform to effect consumer well-being can be provided by consumer engagement with different actors in smart service systems (David, Roberts, and Christenson, 2018; Horwood and Anglim, 2019; Lee, Kwon, Lee, and Kim, 2017). Reinartz et al. (2019) calls for exploring how physical stores can exploit their exclusive value-creation potential, in terms of providing experiences and empowerment, enabling them to succeed in an increasingly digital world. From our analysis, most empirical studies were only conducted with a single location, with only one study, and conducted in two geographical locations, namely United Kingdom and Australia (Sharma et al., 2020). Due to the dynamism of consumer behavior, there are opportunities to conduct research in different

context and across different countries. Indeed, diverse studies suggest the opportunity to conduct comparative studies using Hofstede's cultural dimensions on CE and IoT (Gupta et al., 2018).

INSERT TABLE 8 ABOUT HERE

5.3 Characteristics (C)

Studies on new technologies mostly revolves around disruptive (sophisticated) technology (Inman and Nikolova, 2017), smart technology (Adapa et al., 2020), innovative technology (Renko and Druzijanic, 2014) and self-service technology (Dabholkar and Bagozzi 2002; Meuter et al. 2005; Parasuraman 2000). This is because of the disruption in physical retailing due to the accelerated use of online shopping, mobile shopping, and social commerce, which has placed institutional retail under significant pressure (Verhoef et al., 2015). Our findings indicate that traditional brick-and-mortar shopping is being threatened. Within the retail value chain, the supremacy of stationary retailing is being structurally challenged, as increasing portions of the retail trade are shifted from store-based formats to internet-based formats, including pure players, manufacturer online operations, and platforms (Reinartz et al., 2019). However, despite the erosion of physical retailing – through rising online and mobile shopping platforms – retail institutions are also under pressure to redefine their omnichannel environment (Verhoef et al., 2015). In contrast, we have also seen some online giants, such as Amazon and Zalando, opening physical and offline stores (Warby P., 2018). This exemplifies that stationary retail formats when combined with an integrated online channel foster channel synergy, rather than cannibalization (Herhausen, Binder, Schoegel, and Herrmann, 2015). This can be harmonized with the webrooming effect, as described by Kumar et al., (2017), where consumers research online and purchase in physical stores. It is possible that this model enhances consumer experience via an opportunity to have wide options via different

online channels. Other concepts can be related to consumer experience, such as perception of authenticity, brand image, brand personality, or actual innovation diffusion model.

5.4 Methodology (M)

From our analysis in Table 2, we identified that the most used methodological approach was the quantitative research which accounted for 34% (n=20). This is contrary to previous assertions that there is a relative shortage in the usage of quantitative studies, in examining consumer engagement and new technologies (Dessart et al., 2016). Most researchers who adopted the qualitative methods have called for further revalidation of their findings using quantitative methods (Pantano et al., 2018). The share of mixed methods accounted for only 7% (n=4). Thus, we consider the need to develop more mixed-method approach when studying IoT and CE to identify common determinants and outcomes. The following should be taking into consideration to improve the methodological rigor.

5.4.1 Sample and data collection

From the quantitative survey, questionnaires were the most used instrument for data collection at 55% (n=32), within those 10% (n=6) used experimental methods. 29% (n=17) do not perform any data collection. The usage of multiple case study method employing primary data was quite minimal to none existing. In the studies analyzed, the samples were collected majorly among customers in supermarkets. Consumers in these settings may behave in similar manner due to comparable level of income. Researchers should focus more on other retail context, where the rate of new technological adoption is equally high, such as department stores, clothing or footwear stores, fashion, or jewelry retailers, among others (Sharma et al., 2020). Cross refencing data

collection and studies across different countries and continents will also aid better research outcome.

5.4.2 Analytical tool

Among the empirical studies (Figure 2), we found significant number of articles without any form of analytical tool tagged, mostly falling under conceptual papers (38% n=22, Table 9). We found that the most used method of data analysis was the confirmatory factor analysis (CFA) 9% (n=5), which was employed for factorial validity of scores from the consumer engagement scales and to show close fit for the measurement model (Dessart et al., 2016). The structure equation modelling (SEM) equally accounted for 9% (n=5) mostly used to measure consumer purchase satisfaction (Herrando et al., 2018). Other methods of data analysis that have been employed, include conjoint analysis, mediation approach with Bayesian estimation and multivariant regression. Considering the volume of studies without any analytical tool – due to their conceptual nature – we recommend more research suing. For instance, Structural Equation Model (SEM) to better allow the relations among constructs or Fuzzy-set Qualitative Comparative Analysis (FsQCA) to analyze asymmetries between constructs.

6.Theoretical and practical contributions

In what concerns to theoretical contributions, this literature contributions are threefold. First, we identified the main constructs of CE and IoT and their impact on brand engagement. Although prior studies have advance in the conceptual (Van Doorn et al., 2010) and empirical (Brodie et al., 2013) research on consumer engagement, the understanding of this important construct remains only partially explored. Hence, this study proposes further empirical research on IoT and CE with

clearly defined theoretical foundations and analytical tools to aid general applicability (Dessart et al., 2016). Kumar et al., (2017) in their research identified that customer demographics and culture are essential elements of retail outlet patronage. Gupta et al., (2018) hinted that CE with the firms – either through direct or indirect purchases – are influenced by the culture and socio-cultural environment of the consumer. Hence, the influence of culture in the adoption of new technologies is equally important. Different countries, for example U.K. and Australia, can have a similar culture (Sharma et al., 2020). The geographic limitation of studies calls for future research to conduct a comparative study using Hofstede's cultural dimensions by comparing the effect on developed and developing countries (Fagerstrøm et al., 2020).

Second, we identify a clamor to explore other theoretical models outside the current scope of TAM, such theories include the social exchange theory (Hollebeek, et al., 2016) which explains the perceived personal value and personal investment required when engaging with new technologies and the relationship investment model (RI) (Rusbult, 1980) that suggests three primary predictors of brand commitment and engagement: satisfaction with the relationship, alternatives to the relationship and investments in the relationship (Sung and Campbell, 2009). Tran et al. (2019), from a recently conducted meta-analysis highlighted the need to extend the investment model – help to explain additional variable in relationship commitment (i.e., going beyond the standard three antecedents of satisfaction, quality of alternatives, and investment).

Third, practitioners and researchers should focus on the roles of mobile technology in omni-channel retailing conversion. Especially because most customers now adopt the webrooming effect, where they search online and purchase offline. (Kumar et al., 2017). This is also another factor that enhances consumer experience, as consumers benefit from savings on shipping costs.

Regarding practical implications, we present three different perspectives, that is, economic, consumes, and research community. Economy: Technological advancement in the economy improves personalized services, deepens consumer relationships, and consequently increases the economic output through the service sector (Rust and Huang, 2014). We see a direct effect on the economy and the quality of services as marketing undergoes tremendous transformation due to the impact of IoT.

Consumers: From our analysis, we identified that consumers feel a sense of retail store community when they socially engage with other shoppers and employees (Byuna et al., 2020). Hence, the relevance of bricks and mortar effect is still significant. Even though consumers may not embrace a new product right away, the adopters of an existing product are not technology resisters, but rather willing to explore benefits of the new product before making a final decision (Cui et al., 2009). Digitization positively impacts consumer retail experience, which address long-standing customer needs more effectively than previously possible (Hollebeek et al., 2016).

Research community: The need for the research community to properly examine customer satisfaction at different touch points in the customer purchase journey has been highlighted as pivotal (Grewal et al., 2017). Post purchase examination is equally as important, the mechanics of how physical stores can exploit their exclusive value-creation potential in terms of providing experiences and empowerment, enabling them to succeed in an increasingly digital world is becoming more relevant in our present predicament (Hollebeek et al., 2016).

7.Conclusions

Our research contributes to the existing knowledge of IoT and CE through a comprehensive systematic analysis using the TCCM model. Through this research, we could identify crucial

knowledge gap that are important to enable a full overview of the subject matter. The study detailed the various developments in this field - in the past two decades - by building on existing scholarly reviews and providing a fresh perspective due to the evolving global phenomenal. Yet, identifying cogent areas for future research directions. Our findings suggested that further studies are required (i) to evaluate consumer engagements in our current dynamic retail environment, (ii) extend scope of research beyond research supermarket to other retailing formats, (iii) investigate the effects on other forms of in-store technology, (iv) the need to extend research to multiple countries and (v) cultures to enable generalization of our findings. The literature also revealed some inconsistencies in the reviewed studies, as well as the required justifications in favor of the relevant future directions. It is expected that the research outcomes should give some indications on whether firms should adopt technology-technology interactions (Yadav and Pavlou, 2014) or human-to-human interactions (Aggarwal and McGill, 2012). The importance of this outcome will aid practitioners to identify appropriate angles for investment and strategy formulation in developed and advanced countries.

As technology continues to become very involved in our daily lives, there are tendencies that there will be a natural shift to technology-to-technology interactions (Yadav and Pavlou, 2020) due to our heavy reliance on technological advancement. Advancement in the field of IoT systems, such as smart homes, smart cities, interconnected cars, and the smart energy grid further contributes to these assertions. However, there are legitimate concerns as regards trust in the technology-to-technology interaction without any human interactions, followed by limited generalizability of previous research. The role of human in consumer engagement cannot be totally substituted by machine-to-machine interactions and vice versa irrespective of the highly computerized environment. Human-to-human interactions plays a pivotal role (e.g., when a

customer service consults with a customer attempt to offer products demonstration supports) in

the consumer user journey. Striking this balance and identifying where to apply either or both is

the empirical hypothesis that needs to be validated.

8.References

Adapa, S., Fazal-e-Hasan, S.M., Makam, S.B., Azeem, M.M., and Mortimer, G. (2020), "Examining the antecedents and consequences of perceived shopping value through smart retail technology". *Journal of Retailing Consumer Service,* vol. 52. https://doi.org/10.1016/j.jretconser.2019.101901.

Aggarwal, P. and McGill, A.L. (2012), "When brands seem human, do humans act like brands? Automatic behavioral priming effects of brand anthropomorphism", *Journal of Consumer Research*, Vol. 39 No. 2, pp. 307-323.

Atewologun, D., Kutzer, R., Doldor, E., Anderson, D., and Sealy, R. (2017), "Individual-level foci of identification at work: A systematic review of the literature". *International Journal of Management Reviews*, Vol.19 No.3, pp. 273–295.

Ashton, K. (2009), "That 'Internet of Things' thing", *RFID Journal*, Vol. 22 No. 7, pp. 97-114.

Arora and Sahney, (2018), "Antecedents to consumers' showrooming behaviour: an integrated TAM-TPB framework", *Journal of Consumer Marketing*. Vol. 35, No. 4, pp. 438–450

Alenezi, A., Karim, A.M.A., Veloo, A. (2010), "Institutional Support and E-learning Acceptance: An Extension of the Technology Acceptance Model". *International Journal of Instructional Technology and Distance Learning*, Vol. 8, No. 2, pp.3-16.

Baldus, B. J., Voorhees, C., and Calantone, R., (2015), "Online brand community engagement: Scale development and validation". *Journal of Business Research*, Vol. 68 No.5, pp. 978– 985. Vol. 5, pp. 41-51.

Barling, J. and Beattie, R. (1983), "Self-efficacy beliefs and sales performance", *Journal of Organizational Behavior Management*, Volume 31 · Number 3 · 2014 · 190–199

Bilro, R.G. and Loureiro, S.M.C. (2020), "A consumer engagement systematic review: synthesis and research agenda". *Spanish Journal of Marketing* doi 10.1108/SJME-01-2020-0021

Brehm, S. S. (1985). "Intimate Relationships". New York: Random House.

Brodie, R. J., Hollebeek, L. D., Juric, B., and Ilic, A. (2011), "Customer engagement: Conceptual domain, fundamental propositions, and implications for research". *Journal of Service Research,* Vol.14, pp. 252– 271. DOI:10.1177/1094670511411703

Brodie, R. J., Ilic, A., Juric, B., and Hollebeek, L. (2013), "Consumer engagement in a virtual brand community: An exploratory analysis". *Journal of Business Research*, Vol.66 No.1, pp.105–114.

Bulmer, S., Elms, J., Moore, S. (2018), "Exploring the adoption of self-service checkouts and the associated social obligations of shopping practices". *Journal of Retailing Consum*. Vol.42, pp.107–116.

Blut, M. and Wang, C. (2020), "Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage". *Journal of the Academy of Marketing Science*. Vol 48 No.4, pp. 649-669

Blut, M. and Wang, C. (2020), "A thematic exploration of digital, social media, and mobile marketing: Research evolution from 2000 to 2015 and an agenda for future inquiry". *Journal of Marketing*. Vol. 80, No. 1, pp. 146-172

Bhatti, A., Akram, H., Basit, H.M., Khan, A.U., Raza, S.M., and Naqvi, M.B., (2020), "E-commerce trends during COVID-19 Pandemic". *Int. J. Future Generat. Commun. Netw*. 13 (2), 1449–1452.

Byuna, S., Hanb, S., Kimc, H., and Centrallob, C., (2020), "US small retail businesses' perception of competition: Looking through a lens of fear, confidence, or cooperation". *Journal of Retailing and Consumer Services*, Vol. 52, No.101925

Balaji, M. S.; Roy, and Sanjit K., (2017), "Value co-creation with Internet of things technology in the retail industry". *Journal of Marketing Management*. Vol 33, pp. 7-31

Blut, M., and Wang, C., (2020), "Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage". *Journal of the Academy of Marketing Science*. Vol 48, pp. 649-669

Byun, S.E., Han, S., Kim, H., and Centrallo, C., (2020), "US small retail businesses' perception of competition: Looking through a lens of fear, confidence, or cooperation". *Journal of Retailing and Consumer Services*. Vol. 52, pp. 101925

Balmer, J. M. T., and Yen, D. A., (2017), "The Internet of total corporate communications, quaternary corporate communications and the corporate marketing Internet revolution". *Journal of Marketing Management*. Vol. 33, pp. 131-144

Capatina, A., Kachour, M., Lichy, J., Micu, A., Micu, A. E., and Codignola, F. (2020), "Matching the future capabilities of an artificial intelligence-based software for social media marketing with potential users' expectations". *Technological Forecasting and Social Change*, Vol.151, No. 119794.

Cetindamar, D., Wasti, S.N., Ansal, H. and Beyhan, B. (2009), "Does technology management research diverge or converge in developing and developed countries?" *Technovation*, Vol.29, pp. 45–58.

Cebeci, U., Ertug, A., and Turkcan, H. (2020), "Exploring the determinants of intention to use self- checkout systems in supermarket chain and its application". *Management Science Letters*, Vol.10 No. pp. 1027-1036.

CecezBKecmanovic, D., Galliers, R.D., Henfridsson, O., Newell, S., and Vidgen, R. (2014), "The sociomateriality of information systems: Current status, future directions". *MIS Quarterly* Vol.38 No.3, pp. 809-830.

Crossan, M.M. and Apaydin, M. (2010), "A multi-dimensional framework of organizational innovation: a systematic review of the literature", *Journal of Management Studies*, Vol. 47 No. 6, pp. 1154-1191

Christofi, M., Leonidou, E., and Vrontis, D. (2017), "Marketing research on mergers and acquisitions: A systematic review and future directions". *International Marketing Review*, Vol.34 No.5, pp. 629–651.

Cui C., Bao, W., and Chan, T., (2009), "Consumers' adoption of new technology products: the role of coping strategies". *Journal of Consumer Marketing*, Vol. 26 No. 2, pp. 110–120

Cheah, J. H., Lim, X.J., Ting, H., Liu, Y., and Quach, S., (2020), "Are privacy concerns still relevant? Revisiting consumer behaviour in omnichannel retailing". *Journal of Retailing and Consumer Services*. Vol. pp. 102242

Dada, O., (2018), "A model of entrepreneurial autonomy in franchised outlets: A systematic review of the empirical evidence". *International Journal of Management Reviews*, Vol.20 No.2, pp. 206–226.

Davis, F.D., (1989), "Perceived usefulness, perceived ease of use and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-40.

Davenport, T., Kalakota, R., (2019), "The potential for artificial intelligence in healthcare". *Future Healthcare Journal*. Vol. 6, No. 2, pp. 94–98.

Dabholkar, L., Bobbitt, M., and Lee, E-J. (2003), "Understanding consumer motivation and behavior related to self-scanning in retailing". *International Journal of Service Industry Management,* 14(1), 59–95. doi:10.1108/09564230310465994.

David, M. E., Roberts, J. A., and Christenson, B. (2018), "Too much of a good thing: Investigating the association between actual smartphone use and individual well-being". *International Journal of Human-Computer Interaction*, Vol 34, No 3, pp. 265–275. DOI: https://doi.org/10.1080/10447318.2017.1349250.

Dabholkar and Bagozzi (2002), An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science. Volume* 30, No. 3, pp 184-201.

Denyer, D., Tranfield, D. and Van Aken, J.E. (2008), "Developing design propositions through research synthesis". *Organization Studies*, Vol. 29, pp. 393–413

Dessart, L., Veloutsou, C., and Morgan-Thomas, A., (2016), "Capturing consumer engagement: duality, dimensionality and measurement". *Journal of Marketing Management*. Vol 32, pp. 399-426

De Menezes, L.M. and Kelliher, C. (2011), "Flexible working and performance: a systematic review of the evidence for a business case", *International Journal of Management Reviews*, Vol. 13 No. 4, pp. 452-474.

Denyer, D. and Tranfield, D. (2009), "Producing a systematic review. In Buchanan, D. and Bryman, A. (Eds)", *The Sage Handbook of Organizational Research Methods. Thousand Oaks, CA*: Sage Publications, pp. 671–689.

Dessart L., Veloutsou, C., and Morgan-Thomas, A., (2016), "Capturing consumer engagement: duality, dimensionality and measurement". *Journal of Marketing Management*. Vol 32 No.5-6, pp. 399-426. DOI: https://doi.org/10.1080/0267257X.2015.1130738

Deighton, J. A., and Kornfeld, L. (2009), "Interactivity's unanticipated consequences for marketers and marketing". *Journal of Interactive Marketing*, Vol.23 No. 1, pp. 4–10. doi:10.1016/j. intmar.2008.10.001

Ellen, P. S., Bearden, W. O., and Sharma, S. (1991), "Resistance to technological innovations: An examination of the role of self-efficacy and performance satisfaction". *Journal of the Academy of Marketing Science*, 19(4), 297–307. doi:10.1007/BF02726504

Esther S., (2010), "Technology rejection: The case of the wallet phone". *Journal of Consumer Marketing*. Vol. 4, pp 304-312

Fagerstrøm, A., Eriksson, N. and Sigurdsson, V. (2020), "Investigating the impact of Internet of Things services from a smartphone app on grocery shopping", *Journal of Retailing and Consumer Services.* DOI: https://doi.org/10.1016/j.jretconser.2019.101927

Franco-Santos, M., and Otley, D. (2018), "Reviewing and theorizing the unintended consequences of performance management systems". *International Journal of Management Reviews*, Vol. 20, No. 3, pp. 696–730.

Follmer, K. B., and Jones, K. S. (2018), "Mental illness in the workplace: An interdisciplinary review and organizational research agenda". *Journal of Management*, Vol. 44, No. 1, pp. 325–351.

Fagerstrøm, A., Eriksson, N., and Sigurdsson, V., (2020), "Investigating the impact of Internet of Things services from a smartphone app on grocery shopping". *Journal of Retailing and Consumer Services*. Vol 52.

Flaherty, S. J., McCarthy, M. B., Collins, A. M., and McAuliffe, F. M., (2019), "A different perspective on consumer engagement: exploring the experience of using health apps to support healthier food purchasing". *Journal of Marketing Management*. Vol 35, pp 310-337

Geng C., Wenjing B., and Tsang-Sing C., (2009), "Consumers' adoption of new technology products: The role of coping strategies". *Journal of Consumer Marketing*. Vol 26, pp 110-120

Germain, P.B. and Cummings, G.G. (2010), "The influence of nursing leadership on nurse performance: a systematic literature review". *Journal of Nursing Management*, 18, pp. 425–439.

Grewal, D., Roggeveen, A.L., Sisodia, R., and Nordfält, J., (2017), "The Future of Retailing". *Journal of Retailing*. Vol. 93, No. 1, pp. 1-6, DOI: http://dx.doi.org/10.1016/j.jretai.2016.12.008

Grewal, D., Roggeveen, A., L., and Nordfält, J., (2017), "Enhancing Customer Engagement Through Consciousness". *Journal of Retailing.* Vol 93, pp 55-64

Grewal, D., Roggeveen, A.L., Sisodia, R., and Nordfält, J., (2017), "Enhancing Customer Engagement Through Consciousness". *Journal of Retailing*. Vol. 93. pp. 55-64

Gupta, S., Pansari, A., Kumar, V., (2018), "Global Customer Engagement". *Journal of Marketing*. Vol. 26, No. 1, pp. 4–29. DOI: 10.1509/jim.17.0091

Henkens, B., Verleye, K., and Larivière, B., (2020), "The smarter, the better?! Customer well-being, engagement, and perceptions in smart service systems". *International Journal of Research in Marketing*. Vol. 38, pp 425-447

Herhausen, D., Kleinlercher, K., Verhoef, P. C., Emrich, O., Rudolph, T. (2019), "Loyalty Formation for Different Customer Journey Segments". *Journal of Retailing*. Vol 95, pp 9-29

Herrando, C., Jimenez-Martinez, J., Martin de Hoyos, M. Jose (2018), "Surfing or flowing? How to retain e-customers on the internet". *Spanish Journal of Marketing – ESIC*. Vol 22, pp. 2-21

Herhausen, D., Binder, J., Schoegel, M., and Herrmann, A. (2015), "Integrating Bricks with Clicks: Retailer-Level and Channel-Level Outcomes of Online–Offline Channel Integration," *Journal of Retailing*, Vol. 91, No. 2, pp. 309-325.

Herrando C., Jimenez-Martinez, J., (2018), Surfing or flowing? How to retain e-customers on the internet. *Spanish Journal of Marketing – ESIC. Vol. 22, pp 2-21*.

Herrando, C., Jimenez-Martinez, J., and Martin de Hoyos, M. J. (2018), "Surfing or flowing? How to retain e-customers on the internet". *Spanish Journal of Marketing – ESIC*. Vol 22, pp 2-21

Hoyer, W. D., Kroschke, M., Schmitt, B., Kraume, K., and Shankar, V. (2020), "Transforming the Customer Experience Through New Technologies". *Journal of Interactive Marketing*, Vol. 51, pp 57–71. DOI: https://doi.org/10.1016/j.intmar.2020.04.001

Hoyer, W.D., Kroschke, M., Schmitt, B., Kraume, K., and Shankar, V., (2020), "Transforming the Customer Experience Through New Technologies". *Journal of Interactive Marketing*. Vol. 51, pp. 57–71

Horwood, S., and Anglim, J. (2019), "Problematic smartphone usage and subjective and psychological well-being". *Computers in Human Behavior*, Vol. 97, No 8, pp. 44–50. DOI: https://doi. org/10.1016/j.chb.2019.02.028.

Hollebeek, L. D., Srivastava, R. K., and Chen, T. (2016). "S-D logic–in- formed customer engagement: integrative framework, revised fundamental propositions, and application to CRM". *Journal of the Academy of Marketing Science*, 1-25

Hoffman, D. L., and Novak, T. P., (2018), "Consumer and object experience in the internet of things: An assemblage theory approach". *Journal of Consumer Research*. Vol 44. pp 1178-1204

Hollebeek, L. D., Srivastava, R. K., and Chen, T. (2019), "S-D logic–informed customer engagement: integrative framework, revised fundamental propositions, and application to CRM". *Journal of the Academy of Marketing Science*. Vol. 47, pp 161-185

Hult, G., Tomas M.; Sharma, P.N., Morgeson, F. V., and Zhang, Y., (2019), Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases? Journal of Retailing, Vol 95, pp 10-23

Huang, M.H., and Rust, R. T., (2020), "A Framework for Collaborative Artificial Intelligence in Marketing. Journal of Retailing, Vol. pp. 30-50

Hult, G. T. M., Sharma, P. N., and Morgeson, F. V., Zhang, Y. (2019), Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases? Journal of Retailing. Vol 95, pp 10-23

Huang, Ming Hui; Rust, Roland T. (2020), "A strategic framework for artificial intelligence in marketing". Journal of the Academy of Marketing Science.

Inman, J. Jeffrey and Nikolova, H. (2017), "Shopper-Facing Retail Technology: A Retailer Adoption Decision Framework Incorporating Shopper Attitudes and Privacy Concerns". *Journal of Retailing*, Vol. 93, pp. 7–28. DOI: 10.1016/j.jretai.2016.12.006.

Kamble, S.S., Gunasekaran, A., Parekh, H. and Joshi, S. (2019), "Modeling the internet of things adoption barriers in food retail supply chains", *Journal of Retailing and Consumer Services*, Vol. 48, pp. 154-168. DOI: www.elsevier.com/locate/jretconser

Kamble, S.S., Gunasekaran,, A., and Gawankar, S.A., (2018), "Sustainable Industry 4.0 framework: A systematic literature review identifying the current trends and future perspectives". *Process Saf. Environ. Prot*. 117, 408–425.

Kauppi, K., Salmi, A., and You, W. (2018), "Sourcing from Africa: A systematic review and a research agenda". *International Journal of Management Reviews*, Vol. 20, No.2, pp. 627–650.

Kauppi, K., Moxham, C. and Bamford, D. (2013), "Should we try out for the major leagues? A call for research in sport operations management". *International Journal of Operations and Production Management*, Vol 33, pp. 1368–1399

Keupp, M.M. and Gassmann, O. (2009), "The past and the future of international entrepreneurship: a review and suggestions for developing the field", *Journal of Management*, Vol. 35 No. 3, pp. 600-633.

Keupp, M.M., Palmié, M. and Gassmann, O. (2012), "The strategic management of innovation: a systematic review and paths for future research", *International Journal of Management Reviews,* Vol. 14 No. 4, pp. 367-390.

Knight, G., Madsen, T. K., and Servais, P. (2004), "An inquiry into born-global firms in Europe and the USA". *International Marketing Review*, Vol. 21, No. 6, pp. 645–665.

Kotb, I., and Adel, R., (2020), "Smart Retailing in COVID-19 World: Insights from Egypt" *European Journal of Marketing and Economics*. Vol 3, No. 3, pp. 71-94.

Kumar, V., Anand A., and Song, H., (2017), "Future of Retailer Profitability: An Organizing Framework". *Journal of Retailing*. Vol. 93, No. 1. pp. 96-119

Kulviwat S., Bruner G.C., and Neelankavil J.P., (2013), "Self-efficacy as an antecedent of cognition and affect in technology acceptance". *Journal of Consumer Marketing*. Vol 31. No. 3, pp 190-199.

Kumar, V., (2018), "Transformative Marketing: The Next 20 Years". *Journal of Marketing*. Vol. 82. pp 1-12

Kumar, V., Pozza, I. D., and Ganesh, J. (2013), "Revisiting the satisfaction-loyalty relationship: Empirical generalizations and directions for future research". *Journal of Retailing*. Vol 89. pp 246-262

Kumar, V., and Pansari A., (2016), "Competitive advantage through engagement". *Journal of Marketing Research*. Vol 53, pp 497-514

Kumar, V., Anand, A., Song, H. (2017), "Future of Retailer Profitability: An Organizing Framework". *Journal of Retailing*. Vol 93. pp 96-119

Kotb, I., and Adel, R., (2020), "Smart Retailing in COVID-19 World: Insights from Egypt" *European Journal of Marketing and Economics*. Vol 3, No. 3, pp. 71-94.

Kozinets, R.V., Sherry, J.F, DeBerry-Spence, B., Duhachek, A., Nuttavuthisit, K., and Storm, D. (2002), "Themed flagship brand stores in the new millennium: Theory, practice, prospects". *Journal of Retailing*. Vol 78. pp 17-29

Kiseol Y., (2010), "Determinants of US consumer mobile shopping services adoption: Implications for designing mobile shopping services". *Journal of Consumer Marketing*. Vol. 27, pp 262-270

Kiseol Yang (2010), "Determinants of US consumer mobile shopping services adoption: Implications for designing mobile shopping services". *Journal of Consumer Marketing*. Vol 27, pp 262-270

Lee, B., Kwon, O., Lee, I., and Kim, J. (2017). "Companionship with smart home devices: The impact of social connectedness and interaction types on perceived social support and companionship in smart homes". *Computers in Human Behavior*, Vol 75, No 10, pp. 922–934. DOI: https://doi.org/10.1016/j.chb.2017.06.031

Lamberton and Stephen (2016), "A Thematic Exploration of Digital, Research Evolution from 2000 to 2015 Social Media, and Mobile Marketing: and an Agenda for Future Inquiry". *Journal of Marketing*: AMA/MSI Special Issue Vol. 80, 146–172.

Liao, S.H., and Yang, L.L., (2020), "Mobile payment and online to offline retail business models", *Journal of Retailing and Consumer Services*. Vol 57, pp. 102230

Liu, W., Batra, R., and Wang, H., (2017), "Product Touch and Consumers' Online and Offline Buying: The Role of Mental Representation". *Journal of Retailing*. Vol 93, pp 369-381

Lamberton, C., Stephen, A. T. (2016), "A thematic exploration of digital, social media, and mobile marketing: Research evolution from 2000 to 2015 and an agenda for future inquiry". *Journal of Marketing*. Vol 80, pp 146-172

Madakam, S., Ramaswamy, R., and Tripathi, S. (2015), "Internet of Things (IoT): A Literature Review". *Journal of Computer and Communications*. Vol. 3, No. 5, pp 164–173. DOI: https://doi.org/10.4236/jcc.2015.35021

Macpherson, A. and Jones, O. (2010), "Editorial: strategies for the development of International Journal of Management Reviews". *International Journal of Management Reviews*, Vol 12, pp. 107–113.

Macpherson, A. and Holt, R. (2007), "Knowledge, learning and small firm growth: a systematic review of the evidence", Research Policy, Vol. 36 No. 2, pp. 172-192.

Mathwick, C., Malhotra, N. K., Rigdon, E., (2002), "The effect of dynamic retail experiences on experiential perceptions of value: an internet and catalog comparison". *Journal of Retailing*. Vol 78, pp 51-60

Malhotra A, Melville N.P., and Watson R.T. (2013), "Spurring impactful research on information systems for environmental sustainability". *MIS Quarterly*, 37(4): 126551274.

Meuter, M. L., Bitner, M. J., Ostrom, A. L., and Brown, S. W. (2005), "Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies". *Journal of Marketing*, Vol. 69, pp 61–83. DOI:10.1509/jmkg.69.2.61.60759

M¨uller-Seitz, G. (2012), "Leadership in interorganizational networks: a literature review and suggestions for future research". *International Journal of Management Reviews*, Vol. 28–443.

McCausland, (2021), "Innovating for Sustainability. A systematic review of the body of knowledge". *Research Technology Management*. Vol. 64, No. 4. pp.59-63

Mathwick, C., Malhotra, N.K., Rigdon, E., (2002), "The effect of dynamic retail experiences on experiential perceptions of value: an internet and catalog comparison". *Journal of Retailing*. Vol 78, pp 51-60

Melumad, S., Pham, M.T., (2020), "The Smartphone as a Pacifying Technology", *Journal of Consumer Research*. Vol 47, pp 237-255

Melumad, S., Pham, M. T., (2020), "The Smartphone as a Pacifying Technology", *Journal of Consumer Research*. Vol 47, pp. 237-255

Maslowska, E., Malthouse, E. C., and Collinger, T., (2016), "The customer engagement ecosystem". *Journal of Marketing Management*. Vol 32, pp 469-501

Ming-Hui H., and Roland T. R., (2017), "Technology-driven service strategy*". Journal of the Academy of Marketing Science*. Vol. 45, pp 906-924

Nguyen B., and Simkin L., (2017), "The Internet of Things (IoT) and marketing: the state of play, future trends and the implications for marketing", *Journal of Marketing Management*, Vol. 33, No. 1-2, pp. 1-6

Nguyen, T.D., and Huynh, P.A., (2018), "The roles of perceived risk and trust on e–payment adoption. In: Anh, L.H., et al. (Eds.), Econometrics for Financial Applications, Studies in Computational Intelligence". *Springer International Publishing AG, Switzerland*, pp. 926–940.

Nguyen D. H., and Leeuw S., and Dullaert W.E.H (2018) "Consumer Behaviour and Order Fulfilment in Online Retailing: A Systematic Review", *Internal Journal of Management Review*. Vol. 20, 255–276 (2018) DOI: 10.1111/ijmr.12129

Novak and Hoffman, (2019), "Relationship journeys in the internet of things: a new framework for understanding interactions between consumers and smart objects". *Journal of the Academy of Marketing Science*, pp. 47:216–237. DOI: https://doi.org/10.1007/s11747-018-0608-3

Nofal, A. M., Nicolaou, N., Symeonidou, N., and Shane, S. (2018), "Biology and management: A review, critique, and research agenda". *Journal of Management*, Vol. 44, No. 1, pp 7–31.

Nguyen, B., Simkin, L., (2017), "The Internet of Things (IoT) and marketing: the state of play, future trends and the implications for marketing". *Journal of Marketing Management*. Vol 33, pp 1-6

Ng, Irene C.L., Wakenshaw, S.Y.L., (2017), "The Internet-of-Things: Review and research directions". *International Journal of Research in Marketing*. Vol 34. pp 3-21

Pansari, A. and Kumar, V. (2017), "Customer engagement: the construct, antecedents, and consequences", *Journal of the Academy of Marketing Science*, Vol. 45 No. 3, pp. 294-311

Parasuraman, A., Zeithaml, V. A., and Malhotra, A. (2005), "E-s-qual: A multiple-item scale for assessing electronic service quality". *Journal of Service Research*, Vol. 7, No 3, pp 213–233. DOI: https://doi.org/10.1177/1094670504271156.

Pantano E., and Verteramo, S., (2017), "How technologies are changing the social relationships in the shopping experience?" *Int. J. Tech. Mark.* 12 (2), 151-164.

Pantano, E., Priporas, C.V., and Dennis, C. (2018), "A new approach to retailing for successful competition in the new smart scenario". *International Journal of Retail Distribution Manag*ement, Vol. 46, No. 3, pp. 264–282.

Parasuraman, A. (2000), "Technology readiness index (TRI): A multiple item scale to measure readiness to embrace new technologies". *Journal of Service Research*, Vol. 2, No. 4, pp 307–320. DOI:10.1177/109467050024001.

Prasad, B.D. (2008), "Content analysis: a method in social science research. In Lal Das, D.K. and Bhaskaran, V. (eds), Research Methods for Social Work". New Delhi: Rawat, pp.173–193.

Pantano, E. and Gandini, A. (2017), "Exploring the forms of sociality mediated by innovative technologies in retail settings", *Computers in Human Behavior*, Vol. 77, pp. 367-373.

Pantano, E., Priporas, C.V., and Dennis, C., (2018), "A new approach to retailing for successful competition in the new smart scenario". *International Journal of Retail and Distribution Management,* Vol. 46, No. 3, pp. 264–282.

Paul, J., and Rosado-Serrano, A. (2019), "Gradual internationalization vs born-global/ international new venture models: A review and research agenda". *International Marketing Review*. Vol. 36 No. 6, pp. 830-858.

Pillai, R., Sivathanu, B., Dwivedi, Y., (2020), "Shopping intention at AI-powered automated retail stores (AIPARS)". *Journal of Retailing and Consumer Services*", Vol 57, pp. 102207. DOI: http://www.elsevier.com/locate/jretconser

Pantano, Eleonora; Vannucci, Virginia (2019), "Who is innovating? An exploratory research of digital technologies diffusion in retail industry". *Journal of Retailing and Consumer Services*. Vol. 49. pp 297-304

Pantano, Eleonora; Passavanti, Rosanna; Priporas, Constantinos-Vasilios; Verteramo, Saverino (2018), To what extent luxury retailing can be smart?" *Journal of Retailing and Consumer Services*. Vol 43, pp 94-100

Pantano, E., and Timmermans, H. (2014), "What is smart for retailing?" *Procedia Environmental Sciences*, Vol. 22, pp 101–107. doi:10.1016/j.proenv.2014.11.010

Plouffe, C. R., Bolander, W., Cote, J. A., Hochstein, B., (2016), "Does the customer matter most? Exploring strategic frontline employees' Influence of customers, the internal business team, and external business partners". *Journal of Marketing*. Vol 80, pp 106-123

Peterson, R. A., Balasubramanian, S., (2002), "Retailing in the 21st century: Reflections and prologue to research". *Journal of Retailing*. Vol 78, pp 9-16

Pantano, E., Vannucci, V., (2019), Journal of Retailing and Consumer Services Who is innovating? An exploratory research of digital technologies diffusion in retail industry. Vol 49, pp 297-304

Rosado-Pinto, F. and Loureiro, S.M.C. (2020). "The growing complexity of customer engagement: a systematic review". *EuroMed Journal of Business*, Vol.15 No. 2, pp. 167-203. doi: 10.1108/EMJB-10-2019-0126

Renko, S. and Druzijanic, M. (2014), "Perceived usefulness of innovative technology in retailing: Consumers' and retailers' point of view", *Journal of Retailing and Consumer Services*, DOI: https://doi.org/10.1016/j.jretconser.2014.02.015

Reinders, M.J., Dabholkar, P.A., and Frambach, R.T. (2008). "Consequences of forcing consumers to use technology-based self-service". *J. Service Res*. Vol. 11, No. 2, pp. 107–123.

Reinartz. W., Wiegand, N., Imschloss, M., (2019), "The impact of digital transformation on the retailing value chain International". *Journal of Research in Marketing,* Vol. 36, pp. 350–366

Reinders, M.J., Frambach, R., and Kleijnen, M., (2015), "Mandatory use of technology-based self-service: does expertise help or hurt?" *Eur. J. Market*. Vol. 49 (1/2), pp 190–211.

Rust, (2020), "The future of marketing". *International Journal of Research in Marketing*. Vol. 37. pp. 15–26. DOI: https://doi.org/10.1016/j.ijresmar.2019.08.002

Rusbult, C. E. (1980), "Commitment and satisfaction in romantic associations: A test of the Investment Model". *Journal of Experimental Social Psychology*, Vol. 16, No. 2, pp. 172–186.

Rust, R. and Huang, M-H. (2014), "The Service Revolution and the Transformation of Marketing Science". *Marketing Science,* Vol 33, No. 2, pp. 206–221

Reimers, V., Clulow, V., (2004), Retail concentration: A comparison of spatial convenience in shopping strips and shopping centres. *Journal of Retailing and Consumer Services*. Vol 11, pp 207-221

Reinartz, W., Wiegand, N., Imschloss, M., (2019), "The impact of digital transformation on the retailing value chain". *International Journal of Research in Marketing*. Vol 36. pp 350-366

Ramaswamy, V., Ozcan, K., (2018), "Offerings as Digitalized Interactive Platforms: A Conceptual Framework and Implications". *Journal of Marketing*. Vol 82, pp 19-31

Roland, T. R. and Ming-Hui, H., (2014), "The service revolution and the transformation of marketing science". *Marketing Science*. Vol. 33, pp 206-221

Reinartz, W., Wiegand, N., Imschloss, M., (2019), "The impact of digital transformation on the retailing value chain". *International Journal of Research in Marketing*. Vol 36, pp 350-366

Sedley, R., (2010), "4th Annual Online Customer Engagement Report 2010" (available at http://issuu.com/richardsedley/ docs/customer-engagement-report2010/)

Sharma, P., Ueno, A., and Kingshott, R., (2020) "Self-service technology in supermarkets – Do frontline staff still matter?" *Journal of Retailing and Consumer Services*. Vol. 59, pp. 102356 DOI: https://doi.org/10.1016/j.jretconser.2020.102356

Stemler, S. ,(2001), "An overview of content analysis. Practical Assessment, Research and Evaluation", Vol. 7, pp. 17. Available at http://pareonline.net/getvn.asp?v=7andn=17 (accessed 10 May 2013).

Sung and Campbell, (2009), "Brand commitment in consumer-brand relationships: An investment model approach". *Journal of Brand Management* Vol. 17, 2, 97–113

Sirola-Karvinen, P. and Hyrkäs, K. (2006), "Clinical super- vision for nurses in administrative and leadership positions: a systematic literature review of the studies focusing on administrative clinical supervision". *Journal of Nursing Management*, Vol. 14, pp. 601–609.

Swilley, (2010), "Technology rejection: The case of the wallet phone". *Journal of Consumer Marketing* Vol. 27, No. 4, pp. 304–312

Szymanski D.M., and Hise R.T., (2000), "e-Satisfaction: An Initial Examination" *Journal of Retailing*, Volume 76(3) pp. 309–322, ISSN: 0022-4359

Sharma, P., Ueno, A., Kingshott, R., (2020), "Self-service technology in supermarkets – Do frontline staff still matter?" *Journal of Retailing and Consumer Services*. Vol. pp.102356

Shin, J., Park, Y., and Lee, D., (2018), "Who will be smart home users? An analysis of adoption and diffusion of smart homes". *Technological Forecasting and Social Change*. Vol. pp 134. 246-253

Siebert, A., Gopaldas, C. A., Lindridge, A., Simões (2020), "Customer Experience Journeys: Loyalty Loops Versus Involvement Spirals". *Journal of Marketing*. Vol. 84, pp. 45-66

Szymanski, D. M., Hise, R. T., (2000), "E-satisfaction: An initial examination*". Journal of Retailing*. Vol. 76. pp. 309-322

Sharma, P., Ueno, A., Kingshott, R., (2020), "Self-service technology in supermarkets – Do frontline staff still matter*?" Journal of Retailing and Consumer Services*. Vol. pp 102356

Songpol K., Gordon C. B. II., and James P. N., (2013), "Self-efficacy as an antecedent of cognition and affect in technology acceptance". *Journal of Consumer Marketing*. Vol 31. pp 190-199

Sourabh, A., and Sangeeta, S., (2018), "Antecedents to consumers' showrooming behaviour: an integrated TAM-TPB framework". *Journal of Consumer Marketing*. Vol 35, pp 438-450

Sourabh, A., and Sangeeta, S., (2018), "Antecedents to consumers' showrooming behaviour: an integrated TAM-TPB framework". *Journal of Consumer Marketing*. Vol 35, pp 438-450

Shaphali, G., Anita P., and Kumar V. (2018), "Global Customer Engagement". *Journal of Marketing*. Vol 26, pp 4-29

Shih, E., Schau, H. J., (2011), "To Justify or Not to Justify: The Role of Anticipated Regret on Consumers' Decisions to Upgrade Technological Innovations". *Journal of Retailing*. Vol 87, pp 242-251

Tang, Y. Ming., Chau, K.Y., Xu, D., Liu, X., (2021), "Consumer perceptions to support IoT based smart parcel locker logistics in China". *Journal of Retailing and Consumer Services*. Vol. 62, pp.102659

Tran, P., Judge, M., Kashima, Y., (2019), "Commitment in relationships: An updated meta-analysis of the Investment". *Personal Relationships*. Vol. 26, pp. 158–180. DOI: 10.1111/pere.12268.

Tranfield, D., Denyer, D., and Smart, P. (2003), "Towards a methodology for developing evidence-informed management knowledge by means of systematic review". *British Journal of Management*, Vol. 14, pp. 207–222.

Ting, H., Fam, K.S., Chan, Y.W., and Cheah, J.H., (2019), "Editorial–ten trends shaping the future of marketing: considerations for the academics". *Asian J. Bus. Res*. Vol. 9, No. 1, pp. I–IX.

Valdez Cervantes, A.V. and Franco, A. (2020), "Retailing technology: do consumers care?" *Spanish Journal of Marketing - ESIC*. Vol. 24, No. 3, pp. 355-375 https://www.emerald.com/insight/2444-9709.htm

Van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., and Verhoef, P. C. (2010), "Domo Arigato Mr. Roboto: Emergence of Automated Social Presence in Organizational Frontlines and Customers' Service Experiences", *Journal of Service Research*, Vol. 20, No 1, pp. 43-58

Valdez, C., A., Franco, A., (2020), "Retailing technology: do consumer's care?" *Spanish Journal of Marketing – ESIC*. Vol 24, pp 355-375

Valentini, S., Neslin, S. A., Montaguti, E., (2020), "Identifying omnichannel deal prone segments, their antecedents, and their consequences". *Journal of Retailing*. Vol 96, pp 310-327

Verhoef, P. C., Kannan, P. K., and Inman, J. (2015), "From multi- channel retailing to omni-channel retailing: introduction to the special issue on multi-channel retailing". *Journal of Retailing*, Vol. 91, No. 2, pp. 174–181.

Vivek, S., Beatty, S., and Morgan, R. (2012), "Customer engagement: Exploring customer relationships beyond purchase". *Journal of Marketing Theory and Practice*, Vol. 20, No. 2, pp. 127–145.

Vrontis, D. and Christofi, M. (2021), "RandD internationalization and innovation: A systematic review, integrative framework and future research directions". *Journal of Business Research*. Vol. 128, No. 3, pp. 812-823

Viswanathan, V., Hollebeek, L. D., Malthouse, E. C., Maslowska, E., Jung Kim, S., and Xie, W. (2017). "The dynamics of consumer engagement with mobile technologies". *Service Science*, Vol. 9, No. 1, pp. 36–49

Wagner, C., and Ann, M. (2007), "Enabling Customer-Centricity Using Wiki the Wiki Way," *Journal of Management Information Systems*, Vol. 23, No. 3, pp. 17–43.

Warby, P. (2018), "Retail locations in the U.S." Warbyparker.com, Accessed date: 15 January 2018 https://www.warbyparker.com/retail.

Wang, M., Sebastian, B., and Saul, G. (2012), "Proxemic peddler," *Proceedings of the 2012 International Symposium on Pervasive Displays*, ACM. Waytz,

Wang, C.L. and Chugh, H. (2014), "Entrepreneurial learning: past research and future challenges". *International Journal of Management Reviews*, Vol. 16, pp. 24–61.

Weibler, J. (2017), "Towards a three-component model of relational social constructionist leadership: A systematic review and critical interpretive synthesis". *International Journal of Management Reviews*, Vol. 19, No. 2, pp. 214–236.

Woodside, A. and Sood, S. (2017), Vignettes in the two-step arrival of the internet of things and its reshaping of marketing management's service-dominant logic. *Journal of Marketing Management*. Vol. 33, pp 98-110

Wood, S.L. (2002), "Future fantasies: A social change perspective of retailing in the 21st century". *Journal of Retailing*. Vol. 78, No. 1. pp. 77-83

Wu, Jintao; Chen, Junsong; Dou, Wenyu (2017), "The Internet of Things and interaction style: the effect of smart interaction on brand attachment". *Journal of Marketing Management*. Vol. 33, pp 61-73.

Wood, Stacy L (2002), "Future fantasies: A social change perspective of retailing in the 21st century". *Journal of Retailing*. Vol. 78, pp 77-83

Woodside, Arch G.; Sood, Suresh (2017), "Vignettes in the two-step arrival of the internet of things and its reshaping of marketing management's service-dominant logic". *Journal of Marketing Management*. Vol 33, pp. 98-110

White, A., Breazeale, M., Collier, J.E., (2012), "The Effects of Perceived Fairness on Customer Responses to Retailer SST Push Policies". *Journal of Retailing*. Vol 88. pp. 250-261

Xia, F., Yang, L. T., Wang, L., and Vine, A. (2012), "Editorial: The internet of things". *International Journal of Communication Systems*, Vol. 25, No 4, pp. 1101–1102. doi:10.1002/dac.2417

Yadav M.S., and Pavlou P.A., (2014); Marketing in computer-mediated environments: Research synthesis and new directions. *Journal of Marketing*. Vol 78, pp 20-40

Yadav, M.S. and Pavlou, P.A. (2020), "Technology-enabled interactions in digital environments: a conceptual foundation for current and future research. *Journal of the Academy of Marketing Science*. Vol 48, No 1, pp. 132-136. DOI: https://doi.org/10.1007/s11747-019-00712-3

Yadav, M., Pavlou, P. A., (2020), "Marketing in computer-mediated environments: Research synthesis and new directions". *Journal of Marketing*. Vol 78, pp 20-40 Yang, K. (2010), "Determinants of US consumer mobile shopping services adoption: Implications for designing mobile shopping services". *Journal of Consumer Marketing*. Vol 27, No. 3, pp. 262-270

Yousafzai, S., Foxall G., and Pallister, J., (2007a), "Technology acceptance: A meta-analysis of the TAM: Part 1". *Journal of Modelling in Management*. Vol. 2 No. 3, pp. 251-280. DOI: 10.1108/17465660710834453

Yousafzai, S., Foxall G., and Pallister, J., (2007b), "Technology acceptance: A meta-analysis of the TAM: Part 2". *Journal of Modelling in Management*. Vol. 2 No. 3, pp. 281-304. DOI 10.1108/17465660710834462

Zhu, Z., Nakata, C., Sivakumar, K., Grewal, D., (2013), "Fix It or Leave It? Customer Recovery from Self-service Technology Failures". *Journal of Retailing*. Vol 89, pp 15-29

11.Appendix
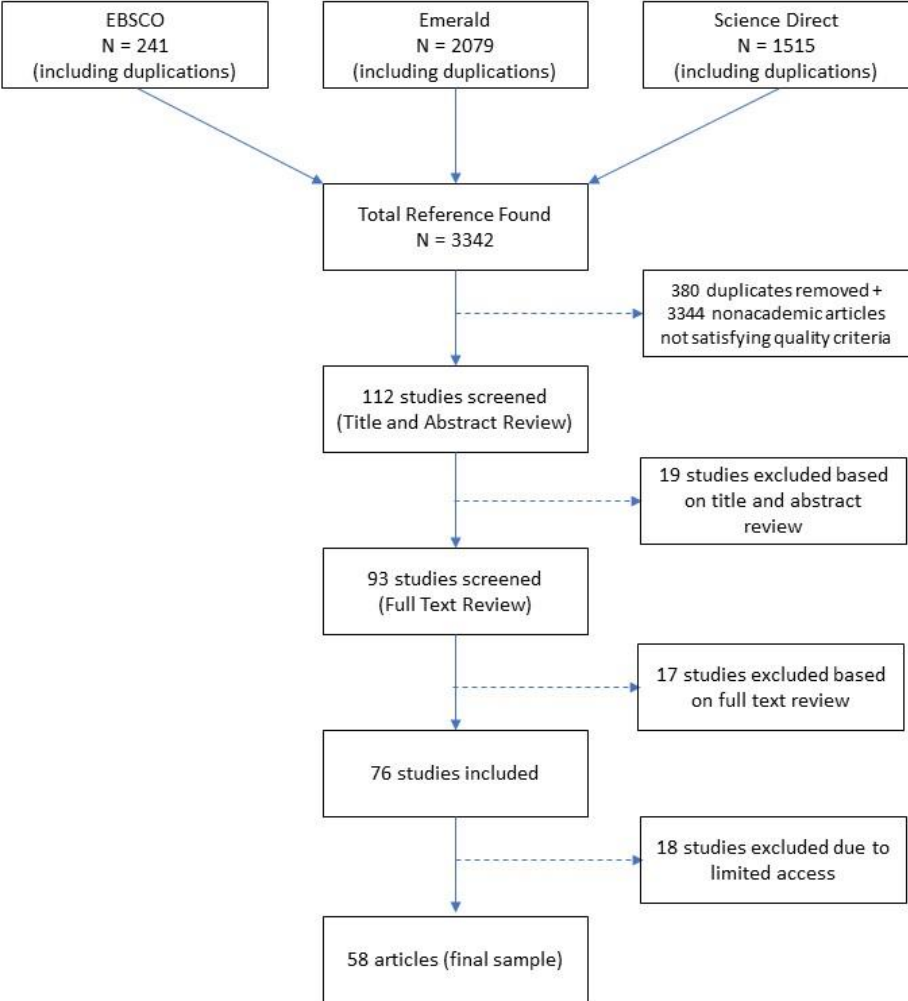
Fig. 1. Literature search strategy

Table 1

Weight of reviewed publications

Year	No	Weight (%)
2000	1	2%
2002	4	7%
2004	1	2%
2009	1	2%
2010	2	3%
2011	1	2%
2012	1	2%
2013	3	5%
2014	1	2%
2016	5	9%
2017	11	19%
2018	7	12%
2019	6	10%
2020	13	22%
2021	1	2%
Total	58	100%

Table 2

Distribution of widely used research methods in our sample

Method	Articles	Total %
Quantitative	21	36%
Case Analysis	17	29%
Qualitative	16	28%
Mixed	4	7%
Total	58	100%

Figure 2

Article frequency analysis by type of source and year

Table 3

Widely used methods in reviewed studies

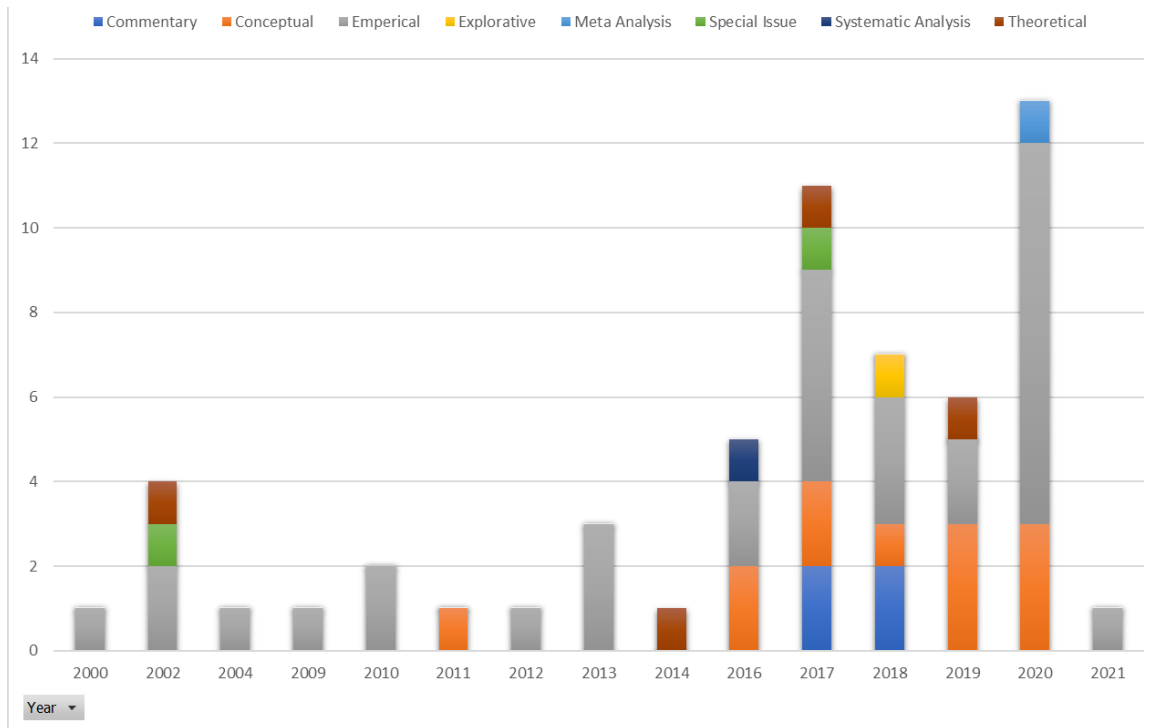| Mixed Method	Qualitative	Quantitative	Case Analysis
Tang, Yuk Ming; Chau, Ka Yin; Xu, Duo; Liu, Xiaoyun (2021)	Siebert, Anton; Gopaldas, Cláudia, Ahir; Lindridge, Andrew; Simões (2020)	Fagerstrøm, Asle; Eriksson, Niklas; Sigurdsson, Valdimar (2020)	Sharma, Piyush; Ueno, Akiko; Kingshott, Russel (2020)
Byun, Sang-Eun; Han, Siyuan; Kim, Hyejeong; Centrallo, Carol (2020)	Valdez Cervantes, Alfonso; Franco, Ana (2020)	Liao, Shu-Hsien; Yang, Ling-Ling (2020)	Blut, Markus; Wang, Cheng (2020)
Hult, G. Tomas M.; Sharma, Pratyush Nidhi; Morgeson, Forrest V.; Zhang, Yufei (2019)	Melumad, Shiri; Pham, Michel Tuan (2020)	Cheah, Jun-Hwa; Lim, Xin-Jean; Ting, Hiram; Liu, Yide; Quach, Sara (2020)	Yadav, Manjit S; Pavlou, Paul A (2020)
Szymanski, David M.; Hise, Richard T. (2000)	Pantano, Eleonora; Vannucci, Virginia (2019)	Valentini, Sara; Neslin, Scott A.; Montaguti, Elisa (2020)	Flaherty, Sarah Jane; McCarthy, Mary B.; Collins, Alan M.; McAuliffe, Fionnuala M. (2019)
	Pantano, Eleonora; Passavanti, Rosanna; Priporas, Constantinos-Vasilios; Verteramo, Saverino (2018)	Huang, Ming Hui; Rust, Roland T. (2020)	Hollebeek, Linda D; Srivastava, Rajendra K; Chen, Tom (2019)
	Wu, Jintao; Chen, Junsong; Dou, Wenyu (2017)	Henkens, Bieke; Verleye, Katrien; Larivière, Bart (2020)	Reinartz, Werner; Wiegand, Nico; Imschloss, Monika (2019)
	Grewal, Dhruv; Roggeveen, Anne L.; Nordfält, Jens (2017)	Herhausen, Dennis; Kleinlercher, Kristina; Verhoef, Peter C.; Emrich, Oliver; Rudolph, Thomas (2019)	Ramaswamy, Venkat; Ozcan, Kerimcan (2018)
	Maslowska, Ewa; Malthouse, Edward C.; Collinger, Tom (2016)	Herrando, Carolina; Jimenez-Martinez, Julio; Martin de Hoyos, M. Jose (2018)	Kumar, V. (2018)
	Kumar, V.; Pozza, Ilaria Dalla; Ganesh, Jaishankar (2013)	Balaji, M. S.; Roy, Sanjit Kumar (2017)	Hoffman, Donna L.; Novak, Thomas P. (2018)
	Zhu, Zhen; Nakata, Cheryl; Sivakumar, K.; Grewal, Dhruv (2013)	Liu, Wumei; Batra, Rajeev; Wang, Haizhogn (2017)	Nguyen, Bang; Simkin, Lyndon (2017)
	Shih, Eric; Schau, Hope Jensen (2011)	Ng, Irene C.L.; Wakenshaw, Susan Y.L. (2017)	Balmer, John M. T.; Yen, Dorothy A. (2017)
	Wood, Stacy L (2002)	Dessart, Laurence; Veloutsou, Cleopatra; Morgan-Thomas, Anna (2016)	Woodside, Arch G.; Sood, Suresh (2017)
	Kozinets, Robert V; Sherry, John F; DeBerry-Spence, Benet; Duhachek, Adam; Nuttavuthisit, Krittinee; Storm, Diana (2002)	White, Allyn; Breazeale, Michael; Collier, Joel E. (2012)	Grewal, Dhruv; Roggeveen, Anne L.; Sisodia, Rajendra; Nordfält, Jens (2017)
	Ming-Hui Huang & Roland T. Rust (2017)	Reimers, Vaughan; Clulow, Val (2004)	Kumar, V; Anand, Ankit; Song, Hyunseok (2017)
	Roland T. Rust & Ming-Hui Huang (2014)	Mathwick, Charla; Malhotra, Naresh K; Rigdon, Edward (2002)	Lamberton, Cait; Stephen, Andrew T. (2016)
	Shaphali Gupta, Anita Pansari, and V. Kumar (2018)	Songpol Kulviwat; Gordon C. Bruner II; James P. Neelankavil (2013)	Plouffe, Christopher R.; Bolander, Willy; Cote, Joseph A.; Hochstein, Bryan (2016)
		Geng Cui; Wenjing Bao; Tsang-Sing Chan (2009)	Peterson, Robert A; Balasubramanian, Sridhar (2002)
		Kiseol Yang (2010) Esther Swilley (2010) Kumar V. Pansari A. (2016) Sourabh Arora and Sangeeta Sahney (2018)	

Table 4

Journals included in the sample

Production outlet	ABS Ranking	No of articles
Journal of Consumer Marketing	4*	5
Journal of Marketing	4*	5
Journal of the Academy of Marketing Science	4*	4
Journal of Consumer Research	4*	2
Spanish Journal of Marketing - ESIC	4*	2
Journal of Marketing Research	4*	1
Marketing Science	4*	1
International Journal of Research in Marketing	4	2
Journal of International Marketing	3	1
Journal of Retailing	2	16
Journal of Marketing Management	2	10
Journal of Retailing and Consumer Services	2	9
Total		58

Table 5

Authorship analysis of reviewed articles

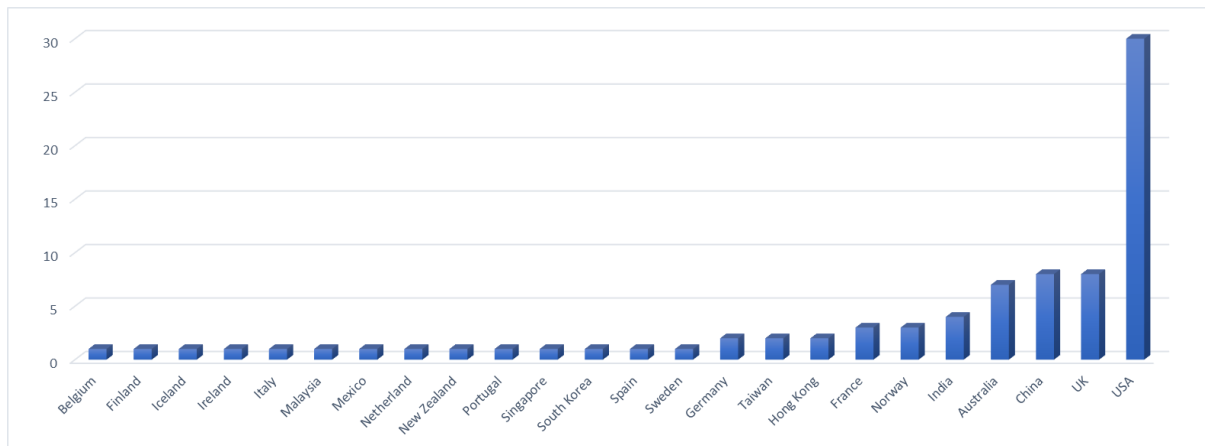| Authorship characteristics	No.	%
Number of authors		
One	7	12%
Two	25	43%
Three or more	26	45%
Total	58	100%
Number of countries		
One	20	34%
Two	21	36%
Three or more	17	29%
Total	58	100%
Number of institutions		
One	20	34%
Two	21	36%
Three or more	17	29%
Total	58	100%

Figure 3

First author's geographical location.

Table 6

Theories used by reviewed studies

Citation details	Theories used
Cheah, Jun-Hwa; Lim, Xin-Jean; Ting, Hiram; Liu, Yide; Quach, Sara (2020)	Psychological Reactance Theory (PRT)
Esther Swilley (2010)	Technology Acceptance Model (TAM)
Geng Cui; Wenjing Bao; Tsang-Sing Chan (2009)	Technology Acceptance Model (TAM)
Herrando, Carolina; Jimenez-Martinez, Julio; Martin de Hoyos, M. Jose (2018)	Stimulus Organism Response
Huang, Ming Hui; Rust, Roland T. (2020)	Construal Level Theory (CLT)
Hult, G. Tomas M.; Sharma, Pratyush Nidhi; Morgeson, Forrest V.; Zhang, Yufei (2019)	American Customer Satisfaction Index (ACSI) Model
Kiseol Yang (2010)	Unified Theory of Acceptance and Use of Technology (UTAUT)
Mathwick, Charla; Malhotra, Naresh K; Rigdon, Edward (2002)	Cognitive Continuum Theory (CCT)
Melumad, Shiri; Pham, Michel Tuan (2020)	Social Exchange Theory
Pantano, Eleonora; Vannucci, Virginia (2019)	Rogers' Theory of Innovation Diffusion
Reinartz, Werner; Wiegand, Nico; Imschloss, Monika (2019)	Assemblage Theory
Sharma, Piyush; Ueno, Akiko; Kingshott, Russel (2020)	Technology Acceptance Model (TAM) and Quality–Value–Satisfaction (QVS)
Songpol Kulviwat; Gordon C. Bruner II; James P. Neelankavil (2013)	Consumer Acceptance of Technology (CAT) and Technology Acceptance Model (TAM)
Sourabh Arora and Sangeeta Sahney (2018)	Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM)
Tang, Yuk Ming; Chau, Ka Yin; Xu, Duo; Liu, Xiaoyun (2021)	Service quality and customer satisfaction
White, Allyn; Breazeale, Michael; Collier, Joel E. (2012)	Fairness Heuristic Theory
Zhu, Zhen; Nakata, Cheryl; Sivakumar, K.; Grewal, Dhruv (2013)	Expectancy Theory and Attribution Theory

Table 7

Frequencies of used theories

Theories	No	%
American Customer Satisfaction Index (ACSI) Model	1	2%
Assemblage Theory	1	2%
Cognitive Continuum Theory (CCT)	1	2%
Construal Level Theory (CLT)	1	2%
Consumer Acceptance of Technology (CAT) and Technology Acceptance Model (TAM)	1	2%
Expectancy Theory and Attribution Theory	1	2%
Fairness Heuristic Theory	1	2%
NA	38	66%
Psychological Reactance Theory (PRT)	1	2%
Rogers' Theory of Innovation Diffusion	1	2%
Service quality and customer satisfaction	1	2%
Social Exchange Theory	1	2%
Special Issue	2	3%
Stimulus Organism Response	1	2%
Technology Acceptance Model (TAM)	3	5%
Technology Acceptance Model (TAM) and Quality–Value–Satisfaction (QVS)	1	2%
Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM)	1	2%
Unified Theory of Acceptance and Use of Technology (UTAUT)	1	2%
Total	58	100%

Table 8
Future research direction using the TCCM framework

Domain	Citation	Avenues for future research
Theory	Plouffe, Christopher R.; Bolander, Willy; Cote, Joseph A.; Hochstein, Bryan (2016)	Generate a general framework that could be applied to different environments namely consumer-to-consumer, business-to-business and consumer-to-business
Context	Balaji, M. S.; Roy, Sanjit Kumar (2017)	Replicate study in other cultures and countries to aid generalizability
	Blut, Markus; Wang, Cheng (2020)	In which task contexts will direct technology-technology interactions replace human-driven interactions (among firms and consumers)? In which contexts is this type of replacement likely to remain partial? Why?
	Esther Swilley (2010)	As this study was limited to one technology, the wallet phone, attitudes toward other technological devices, not just the software, should be addressed.
	Grewal, Dhruv; Roggeveen, Anne L.; Nordfält, Jens (2017)	Examine the effect of the interaction style and its implications in bona fide business settings with IoT technologies
	Grewal, Dhruv; Roggeveen, Anne L.; Sisodia, Rajendra; Nordfält, Jens (2017)	Examine customer satisfaction at different touch points in the customer purchase journey.
	Henkens, Bieke; Verleye, Katrien; Larivière, Bart (2020)	Explore the role of haptics in the effect, whether similar psychological effects arise for other electronic devices that consumers have constant tactile contact with, such as "wearable tech" (e.g., Fitbits, Apple watches).
	Herhausen, Dennis; Kleinlercher, Kristina; Verhoef, Peter C.; Emrich, Oliver; Rudolph, Thomas (2019)	Examine post-purchase touchpoints of the customer journey.
	Henkens, Bieke; Verleye, Katrien; Larivière, Bart (2020)	Explore the role of haptics in the effect, whether similar psychological effects arise for other electronic devices that consumers have constant tactile contact with, such as "wearable tech" (e.g., Fitbits, Apple watches).
	Hult, G. Tomas M.; Sharma, Pratyush Nidhi; Morgeson, Forrest V.; Zhang, Yufei (2019)	Analyze in more detail the interplay between purchase channels, product categories, and customer demographics
	Kumar, V.; Pozza, Ilaria Dalla; Ganesh, Jaishankar (2013)	A systematic analysis of the relationship between satisfaction and loyalty for the various levels of profitability is much needed in the literature
	Kumar, V; Anand, Ankit; Song, Hyunseok (2017)	Examine ways to enhance customers' sense of engagement and explore whether the IoT will increase CE with retailers, service providers, and brands as machines take over all the "talking" to other machines (i.e., the start of machine-to-machine commerce).
	Liu, Wumei; Batra, Rajeev; Wang, Haizhogn (2017)	Can sellers compensate for concrete consumers' inability to touch and to increase their PI and WTP for a product sold online for which they cannot touch prior to purchase?
	Maslowska, Ewa; Malthouse, Edward C.; Collinger, Tom (2016)	Explore the interrelationships between engagement and disengagement over time using a longitudinal sample.
	Mathwick, Charla; Malhotra, Naresh K; Rigdon, Edward (2002)	Replication of this study in mixed gender and male gender populations is warranted
	Liu, Wumei; Batra, Rajeev; Wang, Haizhogn (2017)	Can sellers compensate for concrete consumers' inability to touch and to increase their PI and WTP for a product sold online for which they cannot touch prior to purchase?
	Mathwick, Charla; Malhotra, Naresh K; Rigdon, Edward (2002)	Replication of this study in mixed gender and male gender populations is warranted
	Ng, Irene C.L.; Wakenshaw, Susan Y.L. (2017)	Extend research to other social networks hosting OBCs, such as Twitter, Pinterest, and Instagram.
	Pantano, Eleonora; Vannucci, Virginia (2019)	Consider other categories to offer a more comprehensive overview of the actual innovation diffusion and compare among different retailers operating in different cities or different areas, such the shopping centers and the anchor stores.

Table 8

Future research direction using the TCCM framework

Domain	Citation	Avenues for future research
Context	Reinartz, Werner; Wiegand, Nico; Imschloss, Monika (2019)	Examine the expectation that self-extension experiences will tend to be defined by direct interactions, while self-expansion experiences will emerge more often from ambient interactions
	Siebert, Anton; Gopaldas, Cláudia, Ahir; Lindridge, Andrew; Simões (2020)	Examining new and diverse types of customer journeys
	Songpol Kulviwat; Gordon C. Bruner II; James P. Neelankavil (2013)	Future studies should focus on large but distinct demographic groups. College students are ideal for initial studies of technology-driven products due to their confidence and inclination to accept innovations.
	Sourabh Arora and Sangeeta Sahney (2018)	Further research is required to arrive at definitive conclusions in understanding the consumers' showrooming behaviors
	Valdez Cervantes, Alfonso; Franco, Ana (2020)	Extend scope beyond supermarket so effects can be generalized to other retailing formats and investigate effects on other forms of in-store technology
	Valentini, Sara; Neslin, Scott A.; Montaguti, Elisa (2020)	Understudy channels through which retailers deliver promotions and examine why consumers bifurcate into offline-focused and online-focused deal prone segments
	White, Allyn; Breazeale, Michael; Collier, Joel E. (2012)	Studies to examine other types of SST (e.g., bill payment kiosks) would provide additional value to SST migration research.
	Wood, Stacy L (2002)	Extend research to multiple countries and cultures to enable generalization of our results
	Yadav, Manjit S; Pavlou, Paul A (2020)	Future research should elaborate on customer engagement in the context of smart service systems in which more than two actors are involved.
Characteristics	Balmer, John M. T.; Yen, Dorothy A. (2017)	Investigate how IoTCC empowers different stakeholders, impacting on the corporate identity, image, and reputation?
	Cheah, Jun-Hwa; Lim, Xin-Jean; Ting, Hiram; Liu, Yide; Quach, Sara (2020)	Explore the effects of privacy concerns specifically by addressing the boundary conditions of cultural values.
	Fagerstrøm, Asle; Eriksson, Niklas; Sigurdsson, Valdimar (2020)	Develop a prototype for smartphone app through an experiment in a physical grocery store. Extend studies to other countries like USA and China and comparisons between developed and developing countries
	Geng Cui; Wenjing Bao; Tsang-Sing Chan (2009)	Extend research to multiple countries and cultures to enable generalization of our results
	Herrando, Carolina; Jimenez-Martinez, Julio; Martin de Hoyos, M. Jose (2018)	Extend research to multiple countries and cultures to enable generalization of our results
	Herhausen, Dennis; Kleinlercher, Kristina; Verhoef, Peter C.; Emrich, Oliver; Rudolph, Thomas (2019)	Examine post-purchase touchpoints of the customer journey.
	Herrando, Carolina; Jimenez-Martinez, Julio; Martin de Hoyos, M. Jose (2018)	Extend research to multiple countries and cultures to enable generalization of our results
	Hoffman, Donna L.; Novak, Thomas P. (2018)	Extend research to understand connections impact firm performance is important
	Hollebeek, Linda D; Srivastava, Rajendra K; Chen, Tom (2019)	Explore how physical stores can exploit their exclusive value-creation potential in terms of providing experiences and empowerment, enabling them to succeed in an increasingly digital world.
	Huang, Ming Hui; Rust, Roland T. (2020)	Replicate and validate their findings as well as explore in various locations in retail stores.

Table 8

Future research direction using the TCCM framework

Domain	Citation	Avenues for future research
Characteristics	Liao, Shu-Hsien; Yang, Ling-Ling (2020)	Investigate mobile payment and implementations on the retail channels
	Melumad, Shiri; Pham, Michel Tuan (2020)	Findings suggest the need to examine whether engagement dimensions influence one another in different contexts and the impact that this may have on the individual experience.
	Ming-Hui Huang & Roland T. Rust (2017)	How can a firm determine a customer's needs online, in the quickest and most efficient way?
	Ramaswamy, Venkat; Ozcan, Kerimcan (2018)	More research needed on interaction orientation
	Reimers, Vaughan; Clulow, Val (2004)	Future research must therefore move beyond supply side measures of concentration, and focus on how spatial convenience through retail segregation, is likely to influence consumer patronage behavior.
	Shaphali Gupta, Anita Pansari, and V. Kumar (2018)	Future researchers could do a comparative study of Hofstede's conceptualization and other conceptualizations to determine the use of the most relevant cultural dimensions in any framework.
	Kumar V and Anita Pansari (2016)	Further research should focus on the time-varying effect of engagement on firm performance because it could provide additional insights into the effect of the engagement framework on performance after implementation of the recommended strategies.
	Wu, Jintao; Chen, Junsong; Dou, Wenyu (2017)	Examine the effect of the interaction style and its implications in bona fide business settings with IoT technologies
	Zhu, Zhen; Nakata, Cheryl; Sivakumar, K.; Grewal, Dhruv (2013)	Additional studies needed to determine the impact of relational ties between customers and firms. Studies should be corroborated with actual service firms to gather customer-recovery data
Methodology	Byun, Sang-Eun; Han, Siyuan; Kim, Hyejeong; Centrallo, Carol (2020)	Empirically evaluate the relationships proposed or extend the framework by including other important variables
	Dessart, Laurence; Veloutsou, Cleopatra; Morgan-Thomas, Anna (2016)	Further research must add to this discourse—both empirically and theoretically
	Flaherty, Sarah Jane; McCarthy, Mary B.; Collins, Alan M.; McAuliffe, Fionnuala M. (2019)	Subject CE and S-D logic literature to empirical testing and validation
	Kiseol Yang (2010)	Future researchers should investigate the moderating roles of gender and age in the adoption of mobile shopping services.
	Lamberton, Cait; Stephen, Andrew T. (2016)	Offer conceptual pieces or single-study observational models on broad topics but to do little to offer comprehensive tests.
	Maslowska, Ewa; Malthouse, Edward C.; Collinger, Tom (2016)	Explore the interrelationships between engagement and disengagement over time using a longitudinal sample.
	Nguyen, Bang; Simkin, Lyndon (2017)	What factors affect consumer's engagement with firms? How can firms use the IoT to design and develop a better customer experience?
	Pantano, Eleonora; Passavanti, Rosanna; Priporas, Constantinos-Vasilios; Verteramo, Saverino (2018)	Adopt quantitative methods to reinforce the generalizability of results and a further evaluate the willingness to become smart of the different retail industries
	Roland T. Rust & Ming-Hui Huang (2014)	IT and the service revolution are creating a wealth of new topics to study and new methods with which to study them
	Sharma, Piyush; Ueno, Akiko; Kingshott, Russel (2020)	Use qualitative studies to provide more explanations to speculate different mediator effect on TR dimensions
	Shih, Eric; Schau, Hope Jensen (2011)	Future research using field experiments or survey to improve generalizability of situations consumers might face in real retail purchasing contexts
	Szymanski, David M.; Hise, Richard T. (2000)	An expectancy-disconfirmation analysis should also be conducted with simultaneous comparisons of online retailing to brick-and-mortar retailing, direct marketing, and catalog retailing.
	Tang, Yuk Ming; Chau, Ka Yin; Xu, Duo; Liu, Xiaoyun (2021)	Extend data size by collecting surveys from various target locations such as schools, office buildings, and residential areas

Table 9

Analytical Tools

Tools	No	%
ANOVA	3	5%
ANOVA and T-Test	1	2%
Bid Rent Theory	1	2%
Confirmatory Factor Analysis (CFA)	5	9%
Confirmatory Factor Analysis (CFA) & Regression Analysis	1	2%
Conjoint Analysis	1	2%
Exploratory Factor Analysis	2	3%
framework based on Pantano andTimmermans (2014)	1	2%
Inductive Thematic Analysis	2	3%
Latent Class Analyses (LCA)	2	3%
Mediation Approach with Bayesian Estimation	1	2%
Multivariate Regression	1	2%
NA	22	38%
Reliability Analysis	2	3%
Snowflake schema database	1	2%
Special Issue	2	3%
Story-Telling Task Analysis	1	2%
Structural Equation Modeling	5	9%
Structural Equation Modelling (PLS-SEM)and Partial Least Squares	4	7%
Grand Total	58	100%

Table 10

Method of data analysis

Row Labels	No	%
Comparison	1	2%
Conjoint Analysis	1	2%
Interviews	4	7%
Meta Analysis	1	2%
NA	17	29%
Questionnaire	32	55%
Special Issue	2	3%
Total	58	100%