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E-service quality and e-retailers: Attribute-based multi-dimensional scaling

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ABSTRACT

Digital retail is a technology-driven business. Customers shop with the help of cutting-edge self-service technologies deployed by marketers to enhance customer experience and e-service quality (e-SQ). However, there is a lack of understanding of how customers differentiate between various digital retailers while shopping. We attempt to compare similarity and dissimilarity between top e-retailers based on customer perception grounded in seven dimensions of e-SQ using data from an important emerging market. Multi-Dimensional Scaling (MDS) technique was applied to analyze similarity judgments of the respondents to draw an aggregate perceptual map of the selected e-retailers. Subsequently, discriminant analysis was carried out and the results were used to create combined spatial maps of e-retailers and e-SQ attributes. It was found that consumers can perceive top e-retailers as similar or isolated brands. Our findings suggest that all seven e-SQ attributes can create differentiation among leading e-retailing brands. However, we recommend e-retailers to fortify their service recovery dimensions, as consumers give greater importance to them. Further, we benchmarked fulfilment and contact as critical dimensions for managing e-SQ from the top two e-retailers (Amazon India and Flipkart) and discussed how they are deploying cutting-edge technologies to beef up these dimensions.

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1. Introduction

Online shopping has become a routine for many customers; and the quality delivered through an e-retailer's website plays a vital role in differentiating them from other low-quality sites. It can attract potential customers (Bilkova & Kopackova, 2013), encourage first-time purchases, retain repeat purchases, generate more revenue (Balfagih, Mohamed, & Mahmud, 2012; King, Schilhavy, Chowa, & Chin, 2016), discriminate between the loyal and disloyal groups (Pandey & Chawla, 2016), determine perceptions of attitude toward the presented product (Algharabat, Abdallah, Rana, & Dwivedi, 2017) and facilitate the formation of customer emotions (Hsu & Tsou, 2011). Prior research has confirmed that product offerings do not interfere with customers' perceptions of e-satisfaction (Gelard & Negahdari, 2011). In this case, e-shops selling similar products provided by manufacturers can create differentiation through website quality (Bilkova & Kopackova, 2013). For such differentiation, e-retailers are integrating cutting-edge technologies such as artificial intelligence (AI) (Shankar, 2018), chatbots

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(Chung, Ko, Joung, & Jin, 2020; Pantano & Pizzi, 2020), machine learning (Xia et al., 2012), big data analytics (Bradlow, Gangwar, Kopalle, & Voleti, 2017; Dekimpe, 2020), recommender systems (Zhao et al., 2015), Internet of Things (IoT) (Caro & Sadr, 2019; Fagerstrøm, Eriksson, & Sigurdsson, 2020; Langley et al., 2020; Ng & Wakenshaw, 2017), 3D simulations (Baek et al., 2015), Image Interactivity Technology (IIT), telepresence (Fiore, Kim, & Lee, 2005), etc. into their websites. Researchers argue that website performance is the key indicator of service quality in the online retail segment (Dickinger & Stangl, 2013) and a strategic tool for business differentiation (Hsu, Hung, & Tang, 2012). Therefore, we adopted a website traffic approach to identify top e-retailers that use cutting-edge technologies to reach their customers.

Rapid globalization of economic activities has generated huge opportunities for retailers in emerging markets (EMs) particularly in BRIC (Brazil, India, China, and Russia) nations (Paul, 2020). Studies indicate that BRIC countries have 42 percent of the world population and represent more than 50 percent of world growth (Paul & Benito, 2018; Reinartz et al., 2011; Wilson et al., 2011). Global retailers are focusing on these emerging markets due to high competitive pressure in mature markets (Diallo, 2012). New consumption patterns by middle-class customers are increasing in these countries leading to substantial demand (Kalia, Kaur, & Singh, 2017). Therefore, researchers have recommended new studies relating to technology usage (Ameen, Willis, & Hussain Shah, 2018) and shopping preferences of customers in retailing and allied sectors (Akhlaq & Ahmed, 2015; Paul, 2017; Paul et al., 2016b), particularly in the context of developing and least developed nations (Elg, Ghauri, & Schaumann, 2015). The present study is targeted at the e-retail sector in an emerging market like India because of its huge digital economy worth approximately $4 trillion. India is the fastest growing online retail market in the world. It is estimated to grow over 1200% to $200 billion by 2026, up from $15 billion in 2016 (Akamai India, 2018). Led by the explosive growth of online retailing giants like Flipkart and Amazon, India has become the second-largest online market worldwide (Guru, Nenavani, Patel, & Bhatt, 2020; IBEF, 2020). The lucrativeness of the Indian online market can be understood with the fact that the US retail behemoth like Walmart has bought an 80% stake in Flipkart (ETtech, 2020; Rajan, 2020).

The most important challenge for an e-retailer is to persuade an existing customer to shop with them instead of their competitor (Bourlier & Gomez, 2016). In this scenario, understanding the reactions of the local customers (Grosso, Castaldo, & Grewal, 2018), store image perceptions (Diallo, 2012), branding and clear positioning via customer and competitor centric approaches can enhance the performance (Ramakrishnan, 2010; Reinartz et al., 2011). Many other studies have also advocated brand uniqueness and differentiation to gain a competitive advantage over competitors and remain attractive to customers (Keller, 2013; Lopez & Leenders, 2019; Paul et al., 2016a). In this context, the current study advances knowledge in two main ways, first, primary research based on an Indian sample was carried out to understand similarity and dissimilarity between top e-retailing brands as per customer perception. Second, due to the absence of face-to-face interactions in this high-technology reliant society, companies are using cutting-edge technologies for customer engagement and delivery of e-services (Moriuchi, Landers, Colton, & Hair, 2020). Therefore, we have discriminated top technology-based e-retailers based on seven dimensions of e-service quality (e-SQ) given by Parasuraman et al. (2005). This is the first original study with an attempt to map top e-retailers grounded in e-SQ theoretical attributes using Multi-Dimensional Scaling (MDS) technique and discriminant analysis in an emerging country context, to the best of our knowledge.

The objective of this study is to address the following research questions: (1) Whether customers perceive top e-retailers that use cutting-edge technologies as similar or dissimilar brands? (2) What are the functions (based on e-SQ dimensions), which significantly discriminate top e-retailers? (3) What is the magnitude of e-SQ dimensions discriminating top e-retailers? (4) What is the proximity and positioning of e-retailers to discriminating functions on the preferential maps (to discuss discriminating functions possessed by top e-retailers for benchmarking)? To answer these questions, we did an extensive literature review on e-SQ, competitive positioning, and cutting-edge technologies used by e-retailers. We identified top e-retailers in India through a web traffic overview. Further, we created a perceptual map through the MDS technique to check similarity-dissimilarity between selected e-retailers and applied attribute-based MDS through discriminant analysis to identify functions (service quality dimensions) that significantly discriminate the e-retailers. Further, the results were juxtaposed on preferential maps to observe the proximity and positioning of e-retailers to discriminating functions. Information in this article will be useful for existing or new e-retailers for re-positioning in an emerging e-commerce market.

2. Background

For the research background, we have discussed the concept of competitive positioning to highlight the *"comparison of virtual stores"* by consumers as an important theme. Acknowledging the influence of service quality on differentiation, corporate image, and competitive positioning (Lee & Yang, 2013; Martensen & Grønholdt, 2010; Zeithaml, 2000), we have discussed extremely popular E-S-QUAL and E-RecS-QUAL scale dimensions, designed solely to measure the service quality of websites (Parasuraman et al., 2005). However, e-SQ and e-retail are technology-intensive concepts, because a company and its customers interact over an online platform involving different technologies working invisibly to create a pleasurable service experience throughout the buying process i.e. from initial information search to fulfillment. Therefore, various cutting-edge technologies enhancing competitiveness and e-SQ in retail were discussed.

2.1. Competitive positioning

In general, positioning can be defined as designing and presentation of an organization's image, so that the target audiences can understand the relative difference with the competition in the same marketplace. Therefore, competitive positioning is the combination of "image" and "reality" to create differentiation in the customers' minds against competitors (Evren & Kozak, 2018; Ries & Trout, 2001; Tractinsky & Lowengart, 2003). Researchers believe that dot.com companies have failed in the past due to a flawful understanding of their customers or the inability to know the perception of the customers about them (Wind & Mahajan, 2002). In this scenario, gaining insights of their position vis-à-vis competition on important perceptual dimensions of the retail environment, the retailers can measure their competitiveness (Kotler, 2000), attract and retain customers, improve their business and identify the "open spaces" to attractively reposition themselves (Tractinsky & Lowengart, 2003). On revisiting the previous academic research, we observed focus on three major themes:

2.1.1. Online shopping readiness/intentions

The line of research focused on understanding consumer tendencies and readiness for online shopping in general (Al-maghrabi, Dennis, & Halliday, 2011; Chang, 2011; Kalia, 2018).

2.1.2. Brand evaluation/perception

The second type of research deals with consumer behavior, online branding (Ailawadi & Keller, 2004), users' evaluation of brands offered through websites (Nam et al., 2017) and attempts of brands to create distance with their nearest competitors (Aggarwal, Vaidyanathan, & Venkatesh, 2009).

2.1.3. Comparison of virtual stores

The third theme of research emphasizes competitiveness for survival

and focuses on how consumers evaluate and compare virtual stores (Beig & Nika, 2019; Jin & Park, 2006), store/site rating (Leung, Au, Liu, & Law, 2018) or buying from a specific store (Gefen, 2000).

Although the third line of research is quite close to the issue of the relative positioning of e-retailers to their competition, the problem of understanding customer's preference for one e-retailer over others is still underexplored. For the current study, we have specifically mapped it with e-SQ. Because, there have been strong shreds of evidence that service quality can create differentiation (Martensen & Grønholdt, 2010), influence overall image (Ailawadi & Keller, 2004), drive global competitiveness (Sun & Pang, 2017), build corporate image (Lee & Yang, 2013) and competitive position (Zeithaml, 2000).

2.2. E-service quality

Parasuraman et al. (2005) defined online retail service quality as "... the extent to which a website facilitates efficient and effective shopping, purchasing and delivery." Similarly, while including online transaction and offline fulfillment aspects, Kim, Jin, and Swinney (2009) mentioned that e-retail quality consists of "...the beginning to the end of a transaction, including information search, website navigation, ordering, interactions, delivery and satisfaction with the ordered product.'' Traditionally, researchers believe that service quality is a useful tool to create segmentation (Sánchez-Pérez et al., 2007) and enhance competitiveness (Sun & Pang, 2017). Researchers showed that a high-quality e-shopping website can attract and retain shoppers, influence their shopping decisions (Ha & Stoel, 2012; King, Schilhavy, Chowa, & Chin, 2016), affect customer patronage behavior (Loiacono, Watson, & Goodhue, 2002; Ranganathan & Ganapathy, 2002) and influence e-commitment, e-satisfaction, and e-loyalty with an e-retailer (Al-Hawari, 2014; Anaza & Zhao, 2013; Gounaris, Dimitriadis, & Stathakopoulos, 2010; Klaus & Maklan, 2012). Therefore, an increasing number of organizations are communicating and interacting with customers through the Web, making an appropriate design of offerings a central issue (King, Schilhavy, Chowa, & Chin, 2016). Internet shopping has become a routine way of shopping and website quality holds a pivotal role in creating differentiation. A desirable strategy to succeed is the sustainable delivery of quality service through websites, which is more than just offering low prices and maintaining web presence (Stamenkov & Dika, 2015). However, researchers argue that e-SQ is multi-dimensional comprising outcome and recovery quality in addition to website interactivity or process quality (Peng et al., 2016). Such interaction-points allow an organization to transform its resources to create an enhanced or new competitive capability (Rolland et al., 2009). Many studies have been conducted in developing countries like India (Ghosh, 2018; Kalia, Arora, & Kumalo, 2016), Pakistan (Khan, Zubair, & Malik, 2019), Jordan (Nawafleh, 2018), and Turkey (Kaya, Behravesh, Abubakar, Kaya, & Orús, 2019) where researchers have highlighted the importance of service quality perception in influencing satisfaction, loyalty, future use, purchase intentions, etc.

On scrutiny, it was found that the majority e-SQ scales have applied insights from conventional service quality literature, especially SERVQUAL (Parasuraman et al., 1988) in original or adapted form (Kalia, 2017). Other researchers strongly recommended E-S-QUAL and E-RecS-QUAL scales as the starting point for conceptualizing the e-SQ (Zemblytė, 2015). Moreover, several recent studies have found the validity of E-S-QUAL and E-RecS-QUAL scale dimensions (Table 1).

Hence, for drawing attribute (e-SQ) based preferential maps of selected e-retailers in this study, seven dimensions have been derived from Electronic service quality (E-S-QUAL, four dimensions) and Electronic recovery service quality (E-RecS-QUAL, three dimensions). Here E-RecS-QUAL is a subscale of E-S-QUAL and both have been designed solely to measure the service quality of websites (Parasuraman et al., 2005). These dimensions are efficiency (the ease and speed of accessing and using the site), fulfillment (the extent to which the site's promises about order delivery and item availability are fulfilled), system availability (the correct technical functioning of the site), privacy (the degree to which the site is safe and protects customer information), responsiveness (effective handling of problems and returns through the site), compensation (the degree to which the site compensates customers for problems) and contact (the availability of assistance through telephone or online representatives).

Table 1
Recent studies re-pointing E-S-QUAL and E-RecS-QUAL scale dimensions.

Dimensions	Authors
Efficiency	Herington and Weaven (2009), Janita and Miranda (2013), Mummalaneni, Meng, & Elliott (2016), Santouridis, Trivellas, & Tsimonis (2012), Zhang, He, Qin, Fu, & He (2019)
System availability	Ariff, Yun, Zakuan, and Ismail (2013), Ariff, Yun, Zakuan, and Jusoh (2012), Zehir, Sehitoglu, Narcikara, & Zehir (2014)
Fulfillment	Caruana and Ewing (2010), Ding, Hu, and Sheng (2011), Santouridis et al. (2012)
Privacy	Acquila-Natale and Iglesias-Pradas (2020), Ha and Stoel (2009), Zemblytė (2015), Santouridis & Kyritsi (2014)
Responsiveness	Ding et al. (2011), Lee, Kim, and Ahn (2011), Wu, Tao, Li, Yang, & Huang (2011)
Compensation	Zemblytė (2015), Hu (2009), Wu et al. (2011)
Contact	Pinho, Martins, & Macedo (2011), Wu et al. (2011), Akinci, Atilgan-Inan, and Aksoy (2010)

2.3. Cutting-edge technologies enhancing competitiveness and e-SQ in retail

Before online purchases, customers seek product information and customers aren't satisfied merely watching the product or reading its description. They want to control the online product to induce tactile sensations (Overmars & Poels, 2015). Therefore, e-retailers are using "telepresence" as a part of e-service (Blut, 2016; Blut, Wang, & Schoefer, 2016). To achieve telepresence, studies have recommended factors like standardization of specification, sensory descriptiveness, interactivity, and feedback quality (Lim & Ayyagari, 2018). Similarly, Fiore et al. (2005) confirmed that the level of Image Interactivity Technology (IIT), telepresence, and value variables, determines customer attitude and willingness to purchase and patronize. Baek et al. (2015) also found that visual merchandising (VM) attributes induce pleasure, arousal, and approach behaviors in a retail environment. Many companies are using augmented reality (AR) based service augmentation to enhance customers' value perceptions through simultaneous environmental embedding and simulated physical control (Hilken, Ruyter, Chylinski, Mahr, & Keeling, 2017).

Another interesting technology fueling retail is machine learning. From recommendations on e-commerce sites to a web search or content filtering it is omnipresent (Lecun, Bengio, & Hinton, 2015). Researchers are exploring how machine learning can be useful in different ways. For example, Xia et al. (2012) extended the extreme machine learning to an accurate novel adaptive approach for avoiding stock-out and maintaining a high inventory fill rate in fashion retailing. While purposing personalized promotion in e-commerce recommender systems based on the machine learning model, Zhao et al. (2015) recruited subjects from Amazon Mechanical Turks and confirmed that personalized promotion leads to significantly higher profits for sellers than baseline pricing.

Artificial Intelligence (AI) is reshaping retailing. In simple words, AI includes "programs, algorithms, systems, and machines that demonstrate intelligence" (Shankar, 2018). In the retail environment, these algorithms work as "virtual assistants" which provide interactive dialog between the customer and the organization (Syam & Sharma, 2018) to help customers understand the information provided on the webpages more simply and facilitate the customer decision-making process (Pantano & Pizzi, 2020). Advance technology-based e-retailers like Amazon continuously collect, curate, and analyze data from multiple data sources to improve the ability of their chatbots to adapt and become more independent, interactive, and accurate (Pantano & Pizzi, 2020;

Shankar, 2018).

Many businesses are deploying digital assistants or chatbots to facilitate processes related to the personalization of customer services. Chatbots are "interactive, virtual agents that engage in verbal interactions with humans" (Przegalinska et al., 2019). These digital assistants can take the form of an animated picture, an interactive avatar, or a human-like animated agent (Pantano & Pizzi, 2020). Researchers strongly endorse service-aspect of chatbot communication (Broeck, Zaroualia, & Poels, 2019) and believe that chatbots might replace human jobs (Huang & Rust, 2018). Past studies have confirmed that customers communicate with the chatbot for longer durations than human profanity (Hill, Ford, & Farreras, 2015). While experimenting with old users (mean age of 69 years), Chattaraman, Kwon, and Gilbert (2012) found that embedding a digital assistant for search and navigational support in an online store can lead to increased trust, perceived social support and patronage intention towards the online store. Similarly, a study revealed that e-service rendered by chatbot leads to interactive and engaging customer service encounters (Chung et al., 2020).

The Internet of Things (IoT) can be defined as "a system of uniquely identifiable and connected constituents (termed as Internet-connected constituents) capable of virtual representation and virtual accessibility leading to an Internet-like structure for remote locating, sensing, and/or operating the constituents with real-time data/information flows between them" (Ng & Wakenshaw, 2017). IoT can fundamentally change the business models of companies and the way customers interact with these companies and other stakeholders because it can create hybrid spaces of cyber-socio-physical interactions. Considering omnichannel retailing, IoT can bring channel integration in terms of supply and demand (Caro & Sadr, 2019). Similarly, retailers can benefit by providing technological solutions to customers that combine the traditional point of purchase stimulus with IoT services (Fagerstrøm et al., 2020).

Prior research has shown retailing as a data-driven industry, where stores are selling millions of SKUs to millions of customers through billions of transactions at a macro level. They predict that technology will transform the entire retail value chain at the institutional, process, and value creation levels (Dekimpe, 2020; Paul & Rosenbaum, 2020). There will be an increase in the importance of big data, extant statistical tools, domain knowledge, and predictive analytics due to the large volume and new sources of data (Bradlow et al., 2017).

Researchers believe that the integration of cutting-edge technologies will influence the dimensions of service quality, especially the traditional dimensions involving interaction quality, assurance (inspiring trust, knowledge, and courtesy) and empathy (care and individual attention) (Bock, Wolter, & Ferrell, 2020). Smart technologies have functions similar to e-service dimensions like reliability, accessibility, responsiveness, pleasure (the customer's view of machine use), client's interests (security and privacy), overall system architecture (design), assurance (competence and credibility of service provider), ease of consumer access (convenience), and customized services (shaping customers' requirements by co-production) (Iqbal, Hassan, & Habibah, 2018; Junsawang, Chaiyasoonthorn, & Chaveesuk, 2020). But scientists have fractioned opinions regarding the delivery of service quality through advanced technologies as it could be superior or inferior to the service quality delivered through humans. For example, e-retailers can introduce advanced self-servicing technologies (SSTs) so that customer can enjoy speed and convenience to co-produce service, but satisfaction and productivity will depend on the customers' skills, behavior, knowledge, and engagement (Iqbal et al., 2018; Orel & Kara, 2014). Researchers argue that certain customers can resist advanced technologies under specific conditions due to technology anxiety or different readiness stages (Lian, 2018; Roy et al., 2018). Similarly, perceived service quality and retail patronage will differ in consumers' who prefer contact with a human than an "avatar" (Lee & Yang, 2013). AI and chatbots may face "speciesism" as some customers may consider them as less human, poor on cognitive abilities and more automated in nature (Cubric, 2020; Pozzana & Ferrara, 2020; Schmitt, 2020).

In the case of an online shopping environment, an e-retailer cannot provide a face-to-face contact service to the customers; thus making the interface design fundamentally essential for e-business (Chuang, Chen, Lin, & Yu, 2016). Researchers argue that website performance is the key indicator to measure service quality in online retail (Dickinger & Stangl, 2013) and marketers have to include superior information communication technology (ICT) tools to create an excellent website (Blut, 2016). Businesses understand that an enjoyable website can positively influence impulse purchasing, compulsive shopping, browsing, and attitude. The website has become a strategic tool for business differentiation (Hsu et al., 2012). Therefore, we have adopted a website traffic approach to identify top e-retailers that use cutting-edge technologies to reach their customers.

2.4. Identifying top e-retailers: Website traffic approach[1]

Due to the unavailability of the formal ranking of e-retailers operating in India, we identified top e-retailers based on the website traffic analysis. Data of 10 popular e-retailers in India was collected through similarweb.com for their website traffic, covering sub-themes like total visits, average visit duration (in minutes), page visit, bounce rate, and traffic sources on desktop (See Table 2).

2.4.1. Total visits

In terms of total visits to the website on desktop & mobile web in the last 1-year, Amazon India undisputedly leads the pack with 445.4 million visits, followed by Flipkart with 255.4 million visits. The remaining three e-retailers collectively summed up to just sixty-four percent of total visits at Flipkart.

2.4.2. Average visit duration (in minutes)

Amazon India had the highest average visit duration (7.37 min) followed by Flipkart (6.38 min), Snapdeal (5.16 min), and Shopclues (4.59 min). The lowest average visit duration was observed in eBay India (4.46 min).

2.4.3. Pages per visit

The number of web pages browsed by visitors per visit was highest in Amazon (10.09), followed by Flipkart (7.55) and Shopclues (6.27). On the lower side, eBay India and Snapdeal had 5.02 and 5.49 web page visits, respectively.

2.4.4. Bounce rate

The highest bounce rate was observed in eBay India (43.58%) and Shopclues (42.05%). However, it was moderate in the case of Amazon India (31.56%) and Flipkart (33.16%). The lowest bounce rate was observed in Snapdeal (27%).

2.4.5. Traffic sources (on desktop)

Significant information and insights can be derived through the analysis of traffic sources of a website. For example, a popular website will generate more direct traffic compared to a lesser-known website. The use of search engines to reach a website indicate that visitors have less information or poor recall for that particular website or brand. Amazon India and Flipkart have a better brand recall. Therefore, they have lower search traffic and higher direct traffic. In contrast, eBay India and Snapdeal have high search traffic and comparatively low direct traffic. Shopclues leads the pack in terms of traffic generated through social media and e-mails. Flipkart was successful in generating traffic through online display advertisements.

Based on the above analysis, the top five advanced technology e-

[1] Similarweb.com. (2017), "Meet SimilarWeb", available at: https://www.similarweb.com/(accessed 22 July 2018).

Table 2
Website traffic overview of e-retailers.

Rank	E-retailers	Total visits[a] (in millions)	Avg. visit duration (in minutes)	Pages per visit	Bounce rate (%)	Traffic sources (On the desktop) %					
						Direct	Referrals	Search	Social	Mail	Display
1	Amazon India	445.4	7.37	10.09	31.56	40.24	14.2	38.6	3.57	2.55	0.8
2	Flipkart	255.4	6.38	7.55	33.16	44.73	9.39	26.8	3.67	1.26	14.2
3	eBay India	64	4.46	5.02	43.58	27.14	10.4	56.6	3.71	1.85	0.33
4	Snapdeal	56	5.16	5.49	27	30.43	8.62	56.5	2.77	1.39	0.28
5	Shopclues	36.2	4.59	6.27	42.05	29.92	12	46.4	8.24	2.41	1.04
6	Infibeam	3.4	2.19	2.52	55.39	23.08	7.35	67.2	0.48	1.72	0.16
7	Homeshop18	3.2	5.01	5.6	37.7	22.78	8.24	64.9	0.91	2.51	0.68
8	Naaptol	1.48	4.34	4.31	44.64	22.87	8.47	66.3	1.03	0.85	0.46
9	Indiatimes shopping	0.0284	0.12	1.25	67.25	29.11	5.28	65.6	0	0	0
10	Rediff shopping	0.01	1.31	1.5	54.07	88.1	0	11.9	0	0	0

[a] On desktop & mobile web, in the last 1 year. Source: Similarweb.com, 2017.

retailers were retained for further discussion and analysis. These top five e-retailers i.e. Amazon India, Flipkart, eBay India, Snapdeal, and Shopclues have the same business model i.e. marketplace model and sell products in all the categories (Kalia, 2015; Malviya, 2019; Shopclues.com, 2018).

A brief introduction to these e-retailers is as follows. *Amazon* in India launched Junglee.com in 2012 as a one-stop site for Indian customers to research their options before they buy. After one year, in 2013, Amazon started its operations in India as a pure-play marketplace player, enabling third-party sellers to sell a wide variety of products through the Amazon India website (Kalia, 2015). *Flipkart* started as a virtual merchant selling books through its website in 2007 but added electronics and other products to its portfolio in 2008. Flipkart adopted a hybrid marketplace model in 2012, in which WS Retail (a sister concern of Flipkart) acts as one of the sellers along with other third-party sellers. With 100 million registered users and 100 thousand sellers, Flipkart hosts 80 million products across 80-plus categories and makes 8 million shipments per month through 21 state-of-the-art warehouses across India (Flipkart.com, 2018). *eBay India* is a hundred percent subsidiary of eBay Inc. eBay claims that it is India's leading e-commerce marketplace and largest online shopping website offering a wide range of products across electronics, collectibles, media, and lifestyle categories. It has 2.1 million active users from 4306 cities in India (Ebay, 2018). Kunal Bahl and Rohit Bansal started *Snapdeal* in February 2010. They shifted to a pure-play marketplace model in 2011. Snapdeal hosts the widest assortment of 60 million products across 800 categories. With more than 0.3 million sellers, Snapdeal delivers across 6000+ cities and towns in India (Snapdeal.com, 2018). Launched in 2011 by Sanjay Sethi, Sandeep Aggarwal, and Radhika Aggarwal, *Shopclues* is India's first online managed marketplace owned by Clues Network Pvt. Ltd., based in Gurgaon, India. Shopclues is having more than one thousand employees managing over 0.5 million merchants, 53 million products, 500 billion worth listed merchandise on its platform, serving over 30 thousand cities in India (Shopclues.com, 2018).

3. Research methodology

This paper is an outcome of our original attempt to map top e-retailers grounded in e-SQ theoretical attributes using the MDS technique and discriminant analysis. This study is exploratory, where we have deployed quantitative analysis to answer the research questions. We used convenience sampling, where the researcher personally approached friends, family, colleagues, and students to fill an offline questionnaire. Three hundred and nineteen respondents were approached, out of which 282 completely filled questionnaires were received, yielding a response rate of 88.40 percent. Hence, for analysis, data were drawn from the 282 respondents. These respondents had done online shopping (in the past 6 months) from at least one of the five e-retailers included in this study and were also aware of other retailers. The structure and organization of the present study are depicted in Fig. 1.

3.1. Sample description

Education-wise, most of the respondents were master's (43.6%) or bachelor's degree (25.5%) holders. The sample had an almost equal percentage of males (49.3%) and females (50.7%). In terms of monthly family income, the maximum number of respondents reported an income of more than 1,40,000 Indian Rupees (INR) per month (30.9%), followed by the lowest income category of less than 50,000 INR per month (27.7%). However, as per the occupation, more than 50 percent of respondents belonged to the service category. The split between marital status was found skewed towards unmarried (69.1%) individuals. Most of the survey respondents were young customers with age varying from 19 to 25 (37.9%), followed by 32.6 percent in the age category of 33 and above (Table 3).

3.2. Research instrument

Data was collected through an offline questionnaire comprised of three primary sections. Respondents were asked to fill in their demographic information, i.e., education, age, gender, family income (in terms of Indian Rupees), occupation, and marital status under section A. Section B comprised of a matrix comparing the five most popular e-

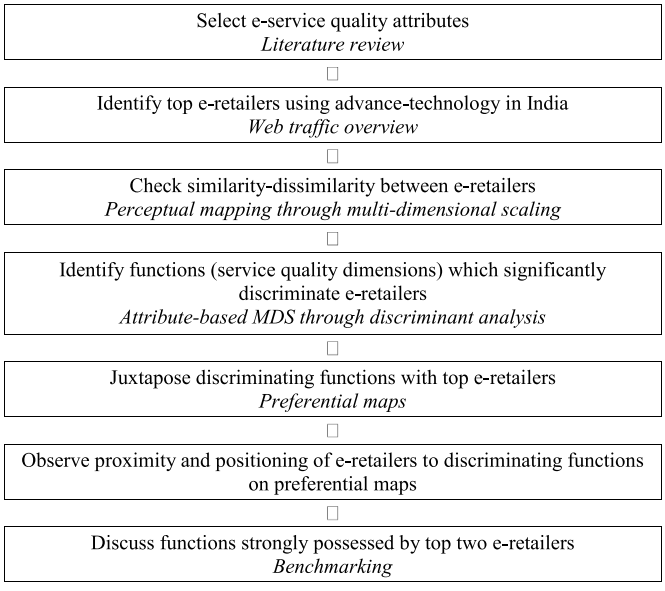

Fig. 1. Structure and organization of the study.

retailers of India. Respondents were asked to indicate similarity and dissimilarity between these e-retailers as per their perception on the scale of 1–10, where 1 stands for highest dissimilarity and 10 for the highest similarity.

In section C, respondents were asked to rate their preferred e-retailer for seven service quality attributes i.e. efficiency, fulfilment, system availability, privacy, responsiveness, compensation and contact (Parasuraman et al., 2005) on the scale of 1–10, where 1 stand for least preferred and 10 for highly preferred.

3.3. Statistical methods

There are several techniques available, including questionnaire development for quantitative assessment of "*how much of something someone has*". However, knowing how individuals structure this knowledge is most important and useful (Anderson, 1982). Quantitative techniques like exploratory factor analysis (EFA) can provide understanding in terms of factor vectors and factor intercorrelations, but it cannot provide visual representation based on real-world geometric space. In such situations, the MDS technique is very useful for the researcher or practitioner to attain a visual representation of these "in the head" constructs (Ferguson, Kerrin, & Patterson, 1997). The MDS technique is very useful in situations where respondents are unaware of the attributes or they are unable or unwilling to represent their reasons (Kėdaitienė & Kėdaitis, 2010). We can easily generalize and discriminate if we understand "similarity" or "dissimilarity" of the situation (or stimuli) to decide the required action (Hout, Papesh, & Goldinger, 2013).

Regarding the current study, initially, we do not pre-specify any characteristics of e-retailers to inductively derive the "mental schemata" of respondents on an aggregate level towards top e-retailers. The "unprompted solicitation" inherent in MDS helps in identification, categorization, and labeling of perceptions even when respondents do not have a set criterion for judgments in their minds. Therefore, there is a "less chance" of findings being contaminated with the preconceptions of the researcher (Ahmed, Hala, Michele, Nazan, & Pervaiz, 2019; Pinkley et al., 2005). Further, the goodness of fit calculated during MDS provides additional reliability (Griessmair, Strunk, & Auer-Srnka, 2011). Subsequently, we used attribute-based MDS to visualize high-dimensional data reduced into a low-dimensional picture (two or three dimensions) to understand the pattern of proximities (i.e., similarities or distances) (Cil, 2012) between top e-retailer based on seven e-SQ dimensions. For the current study, we preferred MDS because it blends mathematical algorithms with subjective interpretation, and an area expert can interpret the graphical output for more refined implications (Gartner, 1989).

This is the first research paper to deploy the MDS technique to obtain quantitative estimates of similarity judgments of the respondents to draw an aggregate perceptual map of the selected e-retailers. Further analysis of responses has been carried out by deploying attribute-based MDS through discriminant analysis. Through this technique, a combined spatial map consisting of e-SQ attribute vectors and e-retailing brands have been created through the output of the discriminant analysis. The demographic information of the respondents has been discussed with the help of descriptive statistics (frequencies). Analysis and spatial representation of responses have been done through the Multi-Dimensional Scaling (ALSCAL) technique. The data was analyzed using SPSS version 23.0 for windows.

Table 3
Sample characteristics (1USD = 70.375 INR[a]).

Characteristics	*N*	%
Education		
Undergraduate	65	23
Graduate	72	25.5
Postgraduate	123	43.6
Doctorate	22	7.8
Gender		
Male	139	49.3
Female	143	50.7
Family income (INR)		
Less than 50,000	78	27.7
50,000–80,000	55	19.5
80,000–1,10,000	45	16
1,10,00–1,40,000	17	6
More Than 1,40,000	87	30.9
Occupation		
Business	29	10.3
Service	153	54.3
Student	78	27.7
Self Employed	22	7.8
Marital status		
Married	87	30.9
Unmarried	195	69.1
Age		
19–25	107	37.9
26–32	83	29.4
33 and Above	97	32.6

[a] Bloomberg. (2019), "USD to INR Exchange Rate", available at: https://www.bloomberg.com/quote/USDINR:CUR (accessed 10 January 2019).

4. Data analysis and results

4.1. Perceptual mapping: multi-dimensional scaling

Similarity judgments of 282 respondents were analyzed through the Multi-Dimensional Scaling (ALSCAL) procedure on an aggregate level for the e-retailers. A high index of fit or R-square value (RSQ = 0.99994) indicated that the MDS model fits the input data. Stress values are also indicative of the quality of MDS solutions. "… *whereas R-square is the measure of goodness of fit, stress measures badness of fit, or the proportion of variance of the optimally scaled data that is not accounted for by the MDS model*" (Malhotra & Dash, 2016). In the case of present data, the lower stress value of 0.00267 indicated excellent goodness of fit (Kruskal, 1964) (Table 4).

The data was plotted on a spatial map (Fig. 2), so that configuration can be interpreted by examining the coordinates and relative positions of the e-retailers. Amazon India and Flipkart were located closely in the same quadrant, i.e., respondents perceived them as similar brands. This also indicated relatively high competition between them. On the contrary, Shopclues, eBay India, and Snapdeal were located as isolated brands on the farthest side of the first, second, and third quadrants, respectively. An isolated position on the spatial map indicates a unique image of a brand.

4.2. Preferential mapping: attribute-based MDS through discriminant analysis

Discriminant analysis was used to develop an attribute-based perceptual map of respondents against each identified discriminating function. Table 5 presents the results of the discriminant analysis. The analysis revealed that all the seven dimensions of e-SQ i.e. efficiency, fulfillment, system availability, privacy, responsiveness, compensation, and contact, considered under the study significantly discriminate e-retailers (Table 5.1). The canonical discriminant functions' descriptions

Table 4
Stimulus coordinates and residual stress value.

Stimulus number	Stimulus name	1	2
1	Amazon	−1.1617	−0.0338
2	Flipkart	−0.3812	−0.2561
3	eBay	−0.4557	1.3986
4	Snapdeal	−0.1309	−1.2985
5	Shopclues	2.1296	0.1898

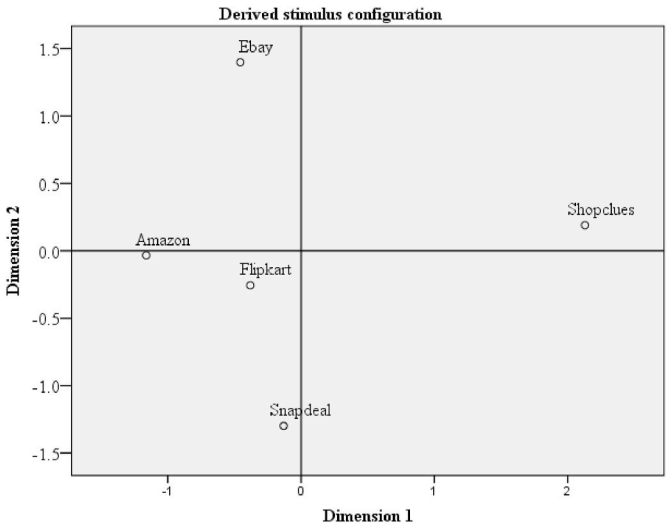

Fig. 2. Spatial map of major e-retailers (Euclidean distance model).

in the result (Table 5.3), made evident that four functions significantly discriminate e-retailers. Since four functions were identified, three perceptual maps of two dimensions were plotted: the first map with Function 1 (F1) and Function 2 (F2) as dimensions, second map with Function 1 (F1) and Function 3 (F3) as dimensions and third map with Function 1 (F1) and Function 4 (F4). Standardized canonical discriminant function coefficients of e-SQ attributes were used to plot attributes (Table 5.3) and unstandardized canonical discriminant functions evaluated at group means (Table 5.4) were taken to plot e-retailers on the map. For example, the standardized canonical discriminant function coefficients of efficiency were −0.034 and 0.355 on F1 and F2 dimensions respectively. Efficiency (-.034 and 0.355) was positioned accordingly on the first map and an arrow was drawn from the origin to that point. This arrow was labeled as an efficiency vector. Similarly, all other attribute vectors, i.e., fulfillment, system availability, privacy, responsiveness, compensation, and contact were positioned on the map (Fig. 3). For plotting e-retailers on the map, unstandardized canonical discriminant functions evaluated at group means were taken. For example, in Amazon India, the unstandardized canonical discriminant functions evaluated at group means from Table 5.4 were −0.350 and 0.252 on F1 and F2 dimensions, respectively. Amazon India was positioned accordingly on the first map (Fig. 3). Similarly, other e-retailers (Flipkart, Snapdeal, Shopclues, and eBay India) were plotted on the map. The second (Fig. 4) and third (Fig. 5) perceptual maps were drawn using the same procedure with F1 against F3 and F1 against F4 dimensions as axes. These perceptual maps were drawn on a Microsoft Excel sheet using the standardized canonical discriminant function coefficients of e-SQ attributes (Table 5.3) and unstandardized canonical discriminant functions, evaluated at group means of e-retailers (Table 5.4).

4.3. Interpretation of perceptual plots

The perceptual maps (Figs. 3, Figure 4, and Fig. 5) depicts the relationship between e-retailers and e-SQ attributes. E-SQ attributes with higher discriminant function coefficients on a given dimension contribute more to discriminate e-retailers in that dimension. The length of the vector represents the relative effect of the respective e-SQ attributes in discriminating on each dimension. Longer attribute vectors in each dimension which are closer to a given dimension contribute more to the interpretation of that dimension. As apparent from the perceptual maps in Figs. 3, Figs. 4 and 5, dimension 1 was primarily characterized by contact, dimension 2 by compensation, dimension 3 by efficiency and system availability, and dimension 4 by responsiveness, fulfillment, and privacy. The e-SQ attribute-e-retailer relationship can be understood by seeing the proximity between the attribute points and any given group (e-retailer) centroid. Longer arrows pointing more closely towards a group centroid (e-retailer) on the map represents e-SQ attributes strongly associated with the e-retailer. It can be noted from Figs. 4 and 5 that Flipkart scores high on the F1 dimension. As dimension 1 is primarily associated with contact, customers who attach higher importance to contact would prefer Flipkart, as Flipkart is perceived as strong on contact.

Similarly, the positioning of other e-retailers in the perceptual map was observed. eBay India scored high on dimension 2 indicating that it is perceived strong on compensation. Dimension 3 primarily consisted of two e-SQ attributes, efficiency, and system availability. The closest e-retailer to system availability vector was eBay India, however, the proximity of specific e-retailer to efficiency vector was not very obvious (Fig. 4). In the case of dimension 4, which included responsiveness, fulfillment, and privacy vectors in descending order of maximum vector length respectively. The closest e-retailer to fulfillment was Amazon India, whereas the closest e-retailer to privacy was eBay India, and the responsiveness vector was Snapdeal (Fig. 5).

Shopclues scored low on all the dimensions compared to competitors. E-SQ attribute vectors pointing the opposite direction from a given group (e-retailer) centroid represent a lower association of the e-retailer on that attribute. It was noted that e-SQ attribute vectors of privacy, compensation, system availability, and responsiveness were pointing in the opposite direction from Amazon India and Flipkart.

On the other hand, contact, fulfillment, and efficiency vectors were found pointing in other directions to eBay India and Snapdeal. It was also noted that Amazon India and Flipkart were closely and uniquely positioned based on the attributes on the perceptual maps (Figs. 4 and 5). Similarly, eBay India and Snapdeal were also positioned uniquely and closely (Figs. 3 and 5). This indicated attribute-perception similarity between these e-retailers. A similarity in perception to contact was observed between Amazon India and Flipkart and similarity in perception to e-SQ attributes like responsiveness (Figs. 3 and 4) and compensation (Figs. 4 and 5) was observed between eBay India and Snapdeal. The close positioning of these e-retailers on the perceptual map indicated high competition among them.

5. Discussion

To the best of our knowledge, this is the first empirical research that attempts to map top e-retailers grounded in e-SQ theoretical attributes using the MDS technique and discriminant analysis in an emerging country context. Our results show that customers can differ in their perceptions of a common set of brands. The results indicate that the e-retail brands considered in the current study have been successful in building brand identity which is the most important task for any cyber brand (Sääksjärvi & Samiee, 2011).

To take this analysis further we tested if this similarity-dissimilarity is due to e-SQ? We used seven dimensions of Electronic service quality (E-S-QUAL, four dimensions) and Electronic recovery service quality (E-RecS-QUAL, three dimensions) (Parasuraman et al., 2005) to draw attribute (e-SQ) based preferential maps of selected e-retailers in our study. We found that all the seven dimensions of e-SQ considered in this study significantly discriminate e-retailers. The result is consistent with the findings of the past studies which confirmed that e-SQ can create differentiation and sustainable competitive advantage (Akinci et al., 2010; Kao & Lin, 2016).

After knowing that seven dimensions of e-SQ significantly discriminate e-retailers, we took this analysis further to understand the discriminating magnitude of individual e-SQ dimensions. We found that customers give greater importance to E-RecS-QUAL dimensions than E-S-QUAL dimensions while comparing e-retailers. This novel finding is coherent to previous studies which indicated that customer form value perceptions and loyalty intentions about the website before and after

Table 5
Results of discriminant analysis.**5.1** Wilk's lambda (U-statistics) and univariate F ratio with 4 and 277 degrees of freedom. **5.2** Canonical discriminant functions. **5.3** Standardized canonical discriminant function coefficients.**5.4** Unstandardized canonical discriminant functions evaluated at group means (functions at group centroids).**5.5** Classification results (a)

Variable	Wilks' lambda	F	df1	df2	Sig.
Efficiency	.925	5.579	4	277	.000
Fulfillment	.936	4.729	4	277	.001
System availability	.935	4.827	4	277	.001
Privacy	.883	9.180	4	277	.000
Responsiveness	.886	8.939	4	277	.000
Compensation	.925	5.634	4	277	.000
Contact	.960	2.857	4	277	.024

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
Eigen values				
1	.281[a]	53.0	53.0	.468
2	.177[a]	33.5	86.5	.388
3	.049[a]	9.2	95.8	.216
4	.022[a]	4.2	100.0	.148

Test of function(s)	Wilks' lambda	Chi-square	df	Sig.
Wilks' lambda				
1 through 4	.619	132.086	28	.000
2 through 4	.792	64.071	18	.000
3 through 4	.933	19.201	10	.038
4	.978	6.105	4	.191

	Function			
	1	2	3	4
Efficiency	-.034	.355	1.507	.276
Fulfillment	-.577	-.009	-.723	1.494
System availability	.445	.202	−1.173	-.776
Privacy	.726	.360	-.520	1.022
Responsiveness	1.238	.770	.236	−1.746
Compensation	.817	−2.573	.261	.330
Contact	−2.039	1.149	.994	-.392

E-retailer	Function			
	1	2	3	4
Amazon	-.350	.252	-.001	.207
Flipkart	-.541	-.612	-.015	-.085
eBay	.752	-.125	-.286	.014
Snapdeal	.522	-.006	.403	-.034
Shopclues	-.311	.760	-.095	-.266

E-retailer			Predicted group membership					Total
			Amazon	Flipkart	eBay	Snapdeal	Shopclues	
Original	Count	Amazon	13	26	4	14	18	75
		Flipkart	7	27	9	9	10	62
		eBay	2	4	27	16	9	58
		Snapdeal	7	8	10	24	3	52
		Shopclues	2	13	0	6	14	35
	%	Amazon	17.3	34.7	5.3	18.7	24.0	100.0
		Flipkart	11.3	43.5	14.5	14.5	16.1	100.0
		eBay	3.4	6.9	46.6	27.6	15.5	100.0
		Snapdeal	13.5	15.4	19.2	46.2	5.8	100.0
		Shopclues	5.7	37.1	0.0	17.1	40.0	100.0

*Significant at 0.05

buying something based on E-Recovery Service Quality of the e-retailer (Das, Mishra, & Cyr, 2019; Lin, Wang, & Chang, 2011; Zehir & Narc, 2016).

Based on web traffic analysis in this study, Amazon India and Flipkart were found as the top two e-retailers in India in terms of high total visits, average visit duration, pages per visit, and high direct traffic. Therefore, we benchmarked fulfillment (Blut, 2016; Chen, Shen, Lee, & Yu, 2017; Zemblytė, 2015) and contact (Elsharnouby & Mahrous, 2015; Saha & Grover, 2011) as essential or primary dimensions from Amazon India and Flipkart respectively. We believe that these dimensions are important than other attributes in creating customers' online shopping experience.

5.1. Theoretical contribution

This research is among the initial studies hinting that E-RecS-QUAL leads to E-S-QUAL. On careful examination of standardized canonical discriminant function coefficients (Table 5.3) and length of e-SQ dimension vectors (Figs. 3–5). We noticed longer vectors for compensation, contact, and responsiveness dimensions i.e. −2.573, −2.039, and −1.746 respectively. These three dimensions constitute E-RecS-QUAL, which is a subscale of E-S-QUAL. Comparatively, four dimensions of E-S-QUAL i.e. efficiency, fulfillment, system availability, and privacy vectors were observed to be shorter in lengths i.e. 1.507, 1.494, 1.173, and 1.022 respectively. It can be inferred that customers give greater importance to E-RecS-QUAL dimensions than E-S-QUAL dimensions while giving preference to e-retailers. Earlier studies emphasized that e-SQ is a major predictor of customer loyalty and satisfaction as compared to service recovery (Honore, Yaya, Marimon, & Casadesus, 2013). But there are studies related to customer responses to online retailer's service recoveries after a service failure (Lin et al., 2011), creation of value perceptions about the web sites based on e-retailers E-Service Quality and E-Recovery Service Quality (Zehir & Narc, 2016), perceived justice with service recovery (PJWSR) (Das et al., 2019) or studies where

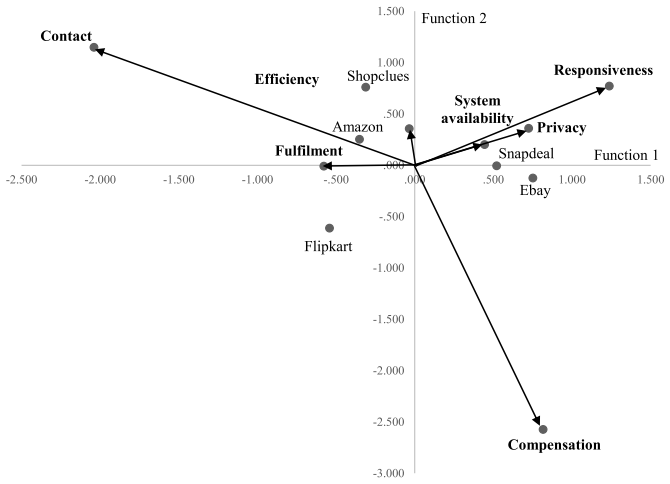

Fig. 3. Function 1 and function 2.

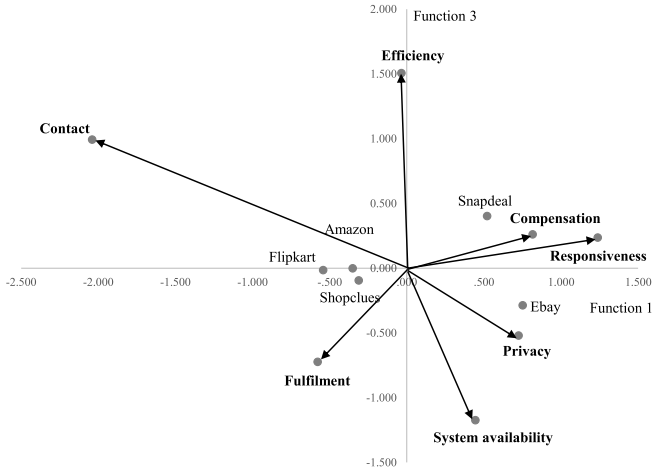

Fig. 4. Function 1 and function 3.

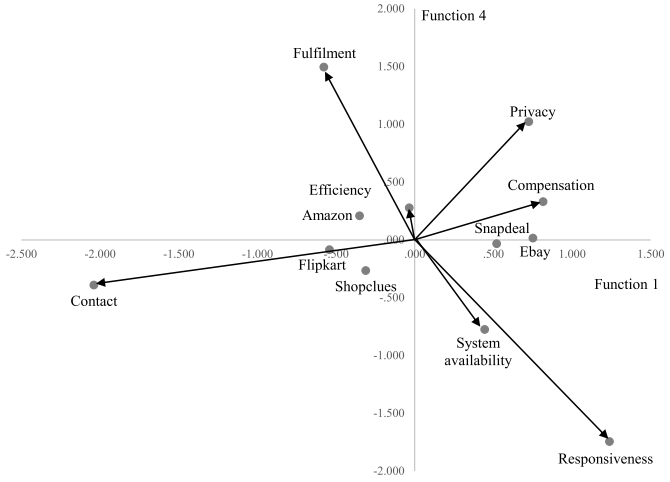

Fig. 5. Function 1 and function 4.

authors highlighted the importance of service recovery as an essential ingredient to create competitive advantage and differentiation (Akinci et al., 2010). E-service failures are the most common stated problems, but little attention has been given in the context of e-retailing (Holloway & Beatty, 2003; Lee & Wu, 2011). Addressing service failures is also crucial as it can cause customers to drift away or engage in negative word of mouth (Maxham & Netemeyer, 2002). Quite concurrent with the above-mentioned studies, one of the interesting findings of this study is that service recovery qualities are more important for e-shoppers. One would imagine that shopping episodes should happen more frequently than product return episodes, but customers have perceived service recovery qualities to be more important than the actual experience in this study. This is contrary to previous reports and is interesting. Therefore studies may identify the mechanism within the e-retail domain where businesses are using cutting edge technologies to deliver e-services. Researchers can explore if e-service failures are due to technology-based service degradation (ITSD) (Tsohou et al., 2019) or technology anxiety of customers (Lian, 2018; Roy et al., 2018). For example, a complex website may evoke negative experiences and motivate customers to seek support via live chat (Mclean & Osei-frimpong, 2019). Our argument is strengthened by the fact that Flipkart has recently started an AI project called 'Mira' in response to its reported 10–11% return rate. They have concluded that large percentages of returns can be prevented by asking one or two simple questions from the customers before they shop (Baruah, 2020). Similarly, other reasons like high service expectations, culture (high uncertainty avoidance) (Zhang et al., 2015), or high future orientation of customers (thinking more about future consequences) can be explored by future studies.

5.2. Managerial implications

5.2.1. Customers can perceive top e-retailers as similar or isolated brands

This study has confirmed the fact that consumers can differ in their perceptions of a common set of brands. On careful examination of the spatial map, we observed that Shopclues, eBay India, and Snapdeal are perceived as isolated brands. Whereas Amazon India and Flipkart are perceived as similar brands. The similarity reflects "…*the degree to which consumers make active and explicit comparisons between the two brands*" (Won et al., 2018). An important research agenda arising from this finding is to know if this similarity is due to the high technology-centric approach of both e-retailing behemoths as compared to their peers? For example, Flipkart has partnered with global tech giant Microsoft to leverage machine learning, AI, and analytics capabilities of Azure platform (which includes Power BI and Cortana Intelligence Suite) for data optimization to improve its marketing, advertising, merchandising and customer service. Similarly, Amazon India is making long-term investments in smart e-commerce technologies to improve its operational efficiencies and customer experiences. Amazon India is deploying AI and machine learning technologies for correcting delivery addresses, improving catalog quality, product size recommendations, deals for events, product search, etc. (Baruah, 2020). From a managerial perspective, marketers can take advantage of this situation in two ways. First, if the brands are similar this can be great information to decide on customer poaching or inducing brand switching (Fudenberg & Tirole, 2000). For example, if a customer is getting the same service or the same product offering from two similar e-retailers, a small price difference may shift the loyalty. On the other hand, marketers can think about creating a substantial differentiation to mitigate such customer migration.

5.2.2. Service quality can create differentiation among top e-retailers

We noticed that all the seven dimensions of e-SQ considered in this study significantly discriminate e-retailers. However, managers must identify the most important aspects of service quality which can build brand credibility and enhance customers' perceived value. After identifying these attributes, marketers can communicate it to the target market to generate higher brand perception in the eyes of their customers (Jahanzeb, Fatima, & Butt, 2013). Also, it would be interesting to know whether cutting-edge technologies employed by e-retailers to enhance physical and interactive quality can create image differentiation (corporate quality) or vice versa (Lee & Yang, 2013).

5.2.3. Benchmarking: e-SQ dimensions related to top e-retailers

The managerial advantage of benchmarking is that, when two brands are perceived as similar, companies can emphasize on brand's superior attributes in comparative advertising (Pornpitakpan & Yuan, 2015). Similarly, e-retailers can emphasize on their superior e-SQ attribute/s when they are perceived relatively similar to other e-retailers. As per web traffic analysis under current research, Amazon India and Flipkart were found as the top two e-retailers in India in terms of high total visits, average visit duration, pages per visit, and high direct traffic. Individually, the remaining three e-tailers (out of top five) are not even 15 percent of the total visits of the topmost e-retailer, i.e., Amazon India. Therefore, we focused on Amazon India and Flipkart for further discussion. We have benchmarked fulfillment and contact dimensions from Amazon India and Flipkart respectively.

On critically observing the service quality attributes closely linked to Amazon India and Flipkart we can understand, "what are the e-SQ attributes that customers associate with top e-retailing brands?" In the present study, we observed that customer perceive fulfillment attribute closer to Amazon India, signaling fulfillment as most important e-SQ dimension. This finding is consistent with past studies that identified fulfillment as the strongest predictor for both e-satisfaction and e-trust as compared to other dimensions of e-tail quality (Kim et al., 2009; Urban, Sultan, & Qualls, 2000). It is strongly recommended for e-retailers to focus on a large proportion of their resources on fulfillment (Kim et al., 2009). Being the market leader, Amazon India has started strengthening fulfillment by launching Connect India Centers (CICs) as assisted shopping points for customers under 'Project Udaan' (Singh, 2017). Amazon employs a massive amount of infrastructure and technology to facilitate warehouse processes which include inbound and outbound logistics, item picking, sorting, packaging, and inventory storage (Inventory Management Services). The software which binds the physical and virtual world is called Amazon Fulfilment Technologies (AFT), which is the world's largest fulfilment execution engine. Amazon also uses advanced cloud-based services like Amazon Aurora, Amazon Web Services (AWS) Database Migration Service, and Amazon Relational Database Service to facilitate timely delivery (Amazon.com, 2020; Roser, 2019). Although these processes run invisibly in the background and they are unknown to customers, but our finding clears that customers identify Amazon strongly on fulfilment dimension.

The second topmost e-retailer identified under this study was Flipkart. Interpretation of perceptual plots indicated that customers perceive Flipkart high on the contact dimension. This finding is relevant because Flipkart is a highly 'customer-centric' company and customers can seek assistance from customer support team (human contact) through various channels including live chat on its official website, social media (such as LinkedIn, Facebook, Twitter, and Blogs), 24/7 telecalling, etc. (Flipkart.com, 2017). Additionally, Flipkart is working on a voice-powered conversational AI platform which includes Automated Speech Recognition (ASR), Text to Speech (TTS), Transliteration, Translation, and Dialog management capabilities (Flipkart Engineering, 2020). This result indicated that contact is perceived as another very important e-service attribute by customers. While increasing service quality, companies should focus on enhancing customer experience at every customer touchpoint (Rosenbaum & Losada, 2017; Şahin et al., 2017). The first e-retailer customer touchpoint is the company website. Website quality influences customers' perceptions of product quality, which subsequently affects online purchase intentions (Wells et al., 2011).

5.3. Limitations and directions for future research

In this study, we have established a perceived similarity or dissimilarity between top e-retailing brands through the MDS technique. Further, these top e-retailers have been discriminated based on seven dimensions of e-SQ with the help of attribute-based MDS through discriminant analysis.

Future researchers can conduct longitudinal studies by analyzing data summary of a comparatively longer period (say over five years) to see the change in web traffic data and comparing it with a shift in brand preference over time. Additionally, researchers can analyze social tagging data to get useful insights into how customers view the content (e-SQ attributes) filtered through their knowledge structures and social influences. Researchers can collect data from a popular social tagging platform in a specified time frame. Bookmarks relevant to a specific brand can be collected by specifying a list of social tags and content tagged with them. A social tag-based approach is considered better than text mining or primary data-based approaches because it uses directly generated brand associations by consumers as per their interactions with brands (Nam et al., 2017). However, some researchers advocate extracting a vast amount of brand-related information available on social media through text mining (He, Zha, & Li, 2013).

A customer may prefer a specific e-retailer to buy a high, medium, or low involvement product (Padmavathy et al., 2019). An e-shopper ordering a high involvement or expensive product through an e-retailer indicates customers' trust in it. Therefore, it would be interesting to predict the most preferred e-retailer through the product-category choice. Product category choice can also be correlated with demographics. For example, a preference for goods and services may change over customers' life-stages as young customers are more experimental and open to new products. Cleveland, Papadopoulos, and Laroche (2011) found that age dominates in consumer electronics and income in luxury goods and household appliances. A customer with high income can buy status-enhancing expensive products, indicating the influence of income over product choice (De Mooij, 2010). Similarly, single consumers make careless decisions as compared to their married counterparts (Khare, 2013). Recently, Kalia (2018a) observed demographic differences in product categories like clothing, books, and auto parts.

Customer brand engagement (CBE) for different e-retailers can be explored to understand the cognitive, emotional, and behavioral brand-related dynamics during focal brand interactions. Such studies can be carried out following the insights from the prior research (Hollebeek, 2011; Hollebeek & Chen, 2014).

The current study has been conducted in the context of a large size emerging economy. We recommend future researchers to complete cross-country studies to further investigate if there is any difference between developing and developed countries and check if customers respond differently to local and international e-retailers.

One of the major limitations of the research is the lack of recent statistics showing top retailers in India. In the absence of any formal ranking identification of top e-retailers has been made based on website traffic analysis. Data of 10 popular e-retailers in India has been collected through similarweb.com in the recent past and top five e-retailers have been retained for discussion and analysis with respect to their website traffic, covering sub-themes like total visits, average visit duration (in minutes), page visit, bounce rate and traffic sources on desktop.

6. Conclusion

An attempt was made through this study to understand similarity or dissimilarity between top e-retailers as per consumer perceptions. Evidence was taken from India, the second-fastest-growing emerging economy and prominent e-commerce market. First, we identified top e-retailers based on website traffic analysis. Subsequently, we created a perceptual map by applying MDS technique on similarity judgment data to outline that consumers can perceive top e-retailers as similar (Amazon India and Flipkart) or isolated brands (Shopclues, eBay India, and Snapdeal). This finding evokes a discussion on marketers' views to mimic its competitor for customer poaching or to create differentiation for an exclusive place in the consumers' minds. We analyzed the situation further and applied discriminant analysis and noticed that consumers distinguish top e-retailing brands based on all the seven

dimensions of e-SQ i.e. there is a sizable scope for e-retailing brands to create e-SQ based differentiation. However, the preferential maps grounded on attribute-based MDS and discriminant analysis brought out that E-RecS-QUAL dimensions have longer vectors as compared to E-S-QUAL dimensions, i.e. even if companies create e-SQ based differentiation the consumers will prefer e-retailers that provide better service recovery. Finally, to identify the core strength of the market leaders in e-retail, we visualized the proximity and positioning of the top two e-retailers on the preferential maps and benchmarked fulfilment and contact as critical dimensions for managing e-SQ.

CRediT author statement

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