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Nikunj Kumar Jain, Hasmukh Gajjar, Bhavin J. Shah, Ashish Sadh,

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E-fulfillment dimensions and its influence on customers in e-tailing: a critical review

E-fulfillment
dimensions

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Nikunj Kumar Jain

*Department of Quantitative Techniques and Operations Management,
Fore School of Management, New Delhi, India*

Hasmukh Gajjar and Bhavin J. Shah

*Operations Management and Quantitative Techniques Area,
Indian Institute of Management Indore, Indore, India, and*

Ashish Sadh

Marketing Area, Indian Institute of Management Indore, Indore, India

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Abstract

Purpose – The purpose of this paper is to understand the dimensions of the e-fulfillment process and its influence on customers in pure e-tailing; to classify the pertinent literature that has evolved over time addressing relevant managerial issues; and to identify the gaps between the practices prevalent in the e-fulfillment and those suggested by academicians to develop insights for future research.

Design/methodology/approach – A critical systemic literature review approach was used for the study with quantitative and qualitative analysis.

Findings – The authors identified seven dimensions of e-fulfillment in the literature on pure e-tailing: e-business quality, product quality, pricing, availability, timeliness, condition and ease of return and explored its linkages with shopping satisfaction and repurchase intention of customers in e-tailing.

Research limitations/implications – The study was skewed toward an empirical approach. The study does not include many of the analytical models in this space.

Practical implications – This study helps e-tailers, academicians and practitioners understand critical dimensions of e-fulfillment and its influence on customers in the pure e-tailing setting in order to design customer-centric e-fulfillment architecture.

Originality/value – The study identified seven dimensions of e-fulfillment in the literature and explored its influence on shopping satisfaction and repurchase intention of customers in pure e-tailing. This is the first compilation of standalone/isolated studies available in the literature to provide e-tailers and academicians meaningful insights into e-fulfillment in the pure e-tailing setting.

Keywords Returns, Repurchase intention, Shopping satisfaction, E-fulfillment dimensions, Pure e-tailing

Paper type Research paper

Introduction

Online retailing (e-tailing) is gaining more popularity among customers worldwide due to the ease of shopping and attractive deals. According to Euromonitor International report 2012, global online retail sales peaked at \$579.9 billion representing 4 percent of the total retail market. Sales are expected to grow at a 15.06 percent compound annual growth rate for the 2012-2017 period due to the increasing penetration of the internet, smart electronic devices and better logistics infrastructure (Euromonitor International, 2013).

A major challenge for an e-tailer is retaining customers who frequently switch to other e-tailers due to the negligible switching cost and minimal effort. E-fulfillment is one major area of e-tailer operations, which significantly influences customers' shopping experience (Koufteros *et al.*, 2014; Lee and Lin, 2005; Thirumalai and Sinha, 2005) and repurchase intention (Koufteros *et al.*, 2014; Posselt and Gerstner, 2005). E-tailers can regain customer loyalty by offering a convenient return process to their customers (Griffis *et al.*, 2012; Mollenkopf *et al.*, 2007, 2011). E-tailers often try to differentiate themselves by providing



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excellent service in one or more dimensions of the e-fulfillment process and influencing customers' shopping satisfaction, repurchase intention, behavioral intention and loyalty. This study is aimed to identify critical e-fulfillment dimensions by thoroughly examining the e-fulfillment process that results into an enriched customer experience in pure play e-tailing. Next, we briefly introduce the e-fulfillment process as well as customers' behavior and attitude.

E-tailers offer a large variety of products and services with discounts to increase customer traffic to their websites. E-tailing operations primarily involve vendor selection, demand and supply management, revenue management, logistics and distribution management among other functions. A robust supply chain network is often seen as a pre-requisite for scaling-up operations for the multi-product online retail model (CRISIL, 2012). E-fulfillment is a key process in e-tailing that requires smooth coordination among all e-tailing operations and is the major interface between e-tailers and customers. E-fulfillment is all about meeting customer expectation and satisfaction – a process that begins with accepting the customer order and ends with the customer receiving exactly what he or she wants, when and where he or she wants it (Tarn *et al.*, 2003). Agatz *et al.* (2008) defined e-fulfillment as the purchasing, warehousing, delivery and sales stages of the supply chain. Pyke *et al.* (2001) suggested that product returns is a part of e-fulfillment and proposed five e-fulfillment processes: order capture, order processing, pick and pack, ship and after-sales service which includes returns handling. Agatz *et al.* (2008, 2013), Davis-Sramek *et al.* (2008), Lee and Whang (2001), Pyke *et al.* (2001), Ricker and Kalakota (1999) and Tarn *et al.* (2003) also defined various stages of the e-fulfillment process. E-fulfillment can be broadly classified into two categories: order procurement and order fulfillment. Order procurement involves order capturing and processing while order fulfillment involves picking and packing, shipping, after-sales service and returns handling.

Several authors have examined various customer behavioral and attitudinal dimensions such as behavioral intention, purchase intention, repurchase intention and loyalty in e-tailing or e-commerce (Khalifa and Liu, 2007; Reibstein, 2002; Reichheld and Scheffer, 2000; Rose *et al.*, 2012). Very few studies have focused on the relationship between e-fulfillment dimensions and customers' behavioral (Boyer and Hult, 2005a, 2006; Collier and Bienstock, 2006; Jiang and Rosenbloom, 2005) and attitudinal (Griffis *et al.*, 2012; Kim *et al.*, 2013; Koufteros *et al.*, 2014) aspects. The purpose of this study was to identify the dimensions of the e-fulfillment process and its influence on customers in pure e-tailing.

In this section, we introduced the study and motivation behind this study. The rest of the paper is organized as follows: the second section provides the scope of the study while the third section describes the methodology used for the critical review. The fourth section describes the literature review on the e-fulfillment process and its dimensions and provides a conceptual framework to study the influence of these dimensions on customers. We then provide a discussion and future research directions. Finally, we describe managerial insights and conclude the paper.

Scope of the study

We started our critical review process by identifying the literature review papers relevant to our study. We found a total of nine literature review papers (see Table I). However, these papers carried out literature reviews on broader themes such as e-commerce (Reynolds, 2000), e-service quality (Ladhari, 2010; Rowley, 2006), internet retailing (Doherty and Ellis-Chadwick, 2006, 2010), e-commerce and retailing (Burt and Sparks, 2003), the impact of e-business on supply chain management (Johnson and Whang, 2002) and taxonomy of multi-channel retailing (Beck and Rygl, 2015). The closest literature review paper to this study was by Agatz *et al.* (2008), who classified e-fulfillment issues of multi-channel retail into two categories: sales and delivery

S.No.	Author	Year	Title	Summary
1	Reynolds	2000	e-Commerce: a critical review, <i>International Journal of Retail and Distribution Management</i>	This paper critically reviewed the literature on various aspects of e-commerce
2	Doherty and Ellis-Chadwick	2006	New perspectives in internet retailing: a review and strategic critique of the field, <i>International Journal of Retail and Distribution Management</i>	This paper critically reviewed and organized the wide-ranging fragmented literature on internet retailing into three broad categories: the retailer perspective, the consumer perspective and the technological perspective
3	Doherty and Ellis-Chadwick	2010	Internet retailing: the past, the present and the future, <i>International Journal of Retail and Distribution Management</i>	It provided a useful critical appraisal of many aspects of internet retailing and predicted future directions for and trends in online shopping
4	Burt and Sparks	2003	E-commerce and the retail process: a review, <i>Journal of Retailing and Consumer Services</i>	This study reviewed the literature reflecting the impact of e-commerce on the retail process. The authors concluded that multi-channel retailing has significant cost reductions in operations, consumer reactions pertaining to new and virtual offers were difficult to understand and retail functions should enhance quality and presentations to attract customers
5	Ladhari	2010	Developing e-service quality scales: a literature review, <i>Journal of Retailing and Consumer Services</i>	This study carried out an extensive literature review of research on the development of e-service quality scales
6	Johnson and Whang	2002	E-business and supply chain management: an overview and framework, <i>Production and Operations Management</i>	It examined the research impact of e-business on supply chain management and classified descriptive frameworks, analytical models, empirical analysis and case studies research articles into three categories: e-commerce, e-procurement and e-collaboration
7	Rowley	2006	An analysis of the e-service literature: towards a research agenda, <i>Internet Research</i>	This paper reviewed articles on e-service quality dimensions and e-service experience factors. They proposed that for better understanding of e-service experiences the e-service dimensions and e-service factors should be taken into consideration
8	Agatz <i>et al.</i>	2008	E-fulfillment and multi-channel distribution – a review, <i>European Journal of Operational Research</i>	This study reviewed and classified analytical models on e-fulfillment issues in multi-channel retail into two categories: sales and delivery planning and supply chain management
9	Beck and Rygiel	2015	Categorization of multiple channel retailing in multi-, cross-, and omni-channel retailing for retailers and retailing, <i>Journal of Retailing and Consumer Services</i>	Categorization of multiple channel retailing in multi-, cross-, and omni-channel retailing

Table I.
Relevant literature review papers found in leading journals

planning and supply chain management. However, that study focused on a review of analytic models in multi-channel retail. Our study primarily focuses on understanding the critical dimensions of the e-fulfillment process and its influence on customers in the pure e-tailing setting in order to design customer-centric e-fulfillment architecture. In all, 73 research articles found on this theme during the next stage of critical review process are discussed in the following sections.

Methodology

We adopted the following four-step process for performing a critical review of the literature on e-fulfillment: select suitable online databases, identify appropriate keywords, assemble an appropriate sample of journal articles and select articles for review.

Selecting suitable online databases

The first step in conducting a literature review is to identify the relevant online databases and indexes. Literature was searched in various databases such as Emerald, Science Direct ABI/INFORM, EBSCOhost and Google Scholar, since these databases include management and social science research journals.

Identifying appropriate keywords

After selecting the relevant online databases, the next step was to search the journal articles by using appropriate keywords. We were interested in conducting a review of literature on e-fulfillment processes in the e-tailing context. Therefore, to identify relevant journal articles, we used the following keywords: e-fulfillment, order fulfillment, online retail, e-commerce and e-tailing. Although e-fulfillment was the focus in this study, some papers related to e-commerce were included in the review to get more insights into the e-fulfillment process.

Assembling an appropriate sample of journal articles

After we had identified the online databases and keywords, we targeted the journals in which the research articles focused mainly on e-fulfillment and the order fulfillment process in the e-tailing context. We identified 24 journal articles related to e-fulfillment process were frequently published. These journals were then targeted to identify research articles.

Selecting research articles for review

Once we had finalized the journals, we inspected the articles in the journals based on the keywords and thoroughly reviewed them. We classified the research paper as relevant, when the authors examined e-fulfillment dimensions in an online retailing context including behavioral and attitudinal aspects of consumer as well. In all, 73 research articles pertinent to this study were selected after critically examining all the papers available from the targeted databases. The key statistics related to the journal articles selected for critical review are presented in Tables II and III. The statistics reveal that the research in e-tailing is contemporary and is gaining attention by the researchers. Next, we carry out the literature review and model development.

Literature review

In this section, we analyzed the pertinent literature on the various e-fulfillment dimensions described in Figure 1 and established their influence on customers in the pure play e-tailing setting. We classified e-fulfillment into two categories, namely, order procurement and order fulfillment. Order procurement was further sub-classified into three dimensions: e-business quality, product quality and pricing. Order fulfillment was

further sub-classified into four dimensions: physical distribution service quality (PDSQ) dimensions; availability, timeliness, condition and reverse logistics. The detailed review is summarized in Table AI.

E-fulfillment
dimensions

E-business quality

Initially, research on e-tailing focused on scale (instrument) development for measuring service quality of e-tailers. Zeithaml *et al.* (2002) developed electronic service quality scale by incorporating five dimensions (information availability and content, ease of use,

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Journal	No. of papers
<i>Journal of Operations Management</i>	13
<i>International Journal of Retail and Distribution Management</i>	12
<i>Journal of Retailing</i> ; and <i>Journal of Retailing and Consumer Services</i>	7
<i>Asia-Pacific Journal of Marketing and Logistics</i>	6
<i>Decision Sciences</i>	6
<i>Journal of Academy of Marketing Science</i>	4
<i>Journal of Services Research</i>	3
<i>Journal of Business Research</i> ; and <i>Journal of Business Logistics</i>	4
Others	18
Total	73

Table II.
Distribution by
journal of
articles selected
for critical review

Year	Until 2000	2001-2005	2006-2010	2011-2016	Total
No. of papers	4	20	22	27	73

Table III.
Distribution by year
of articles selected
for critical review

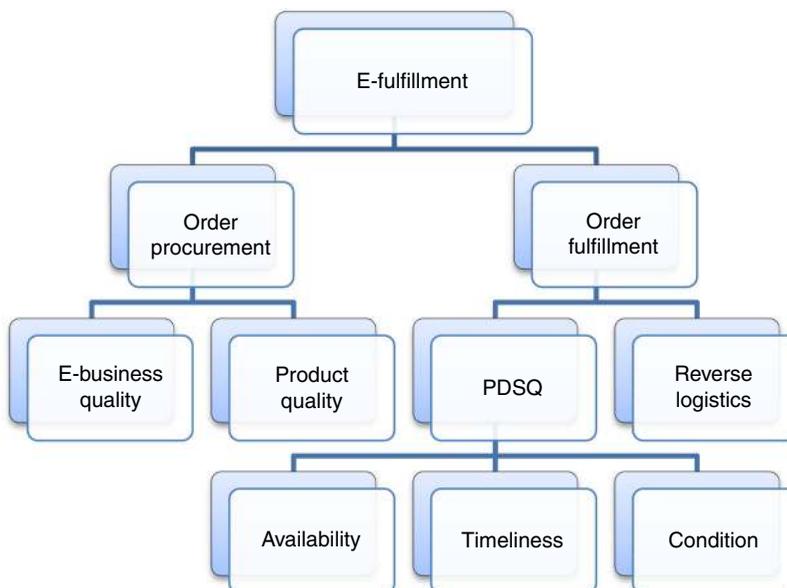


Figure 1.
Literature review
classification

privacy/security, graphic style and fulfillment/reliability) to measure the service quality of e-tailers. Wolfenbarger and Gilly (2003) proposed e-tail quality (e-tailQ) (website design, fulfillment/reliability, privacy/security and customer service) and Parasuraman *et al.* (2005) developed a multi-item ES-QUAL scale with four dimensions (efficiency, fulfillment, system availability and privacy) for measuring service quality delivered by various websites. Service recovery quality (E-RecS-QUAL scale composed of responsiveness, compensation and contact) addressed after-sales service (Parasuraman *et al.*, 2005); utilitarian and hedonic elements (Bauer *et al.*, 2006) and operational drivers of service quality (Heim and Field, 2007) had been examined in e-tailing context. Boyer and Olson (2002) studied a similar measure for online retail and labeled the construct site ease, which assessed specific aspects of navigation, the sequence of steps, and the ease of searching on a website for ordering a product online. Agarwal and Prasad (1999) considered different aspects of quality that are critically affected by taking orders online. Boyer and Hult (2005a) developed the construct e-business quality based on previous work (Agarwal and Prasad, 1999; Boyer and Olson, 2002; Zeithaml *et al.*, 2000). They promulgated the idea of a simple and understandable website that makes transactions as easy and transparent as possible, while delivering what the customer ordered.

Boyer and Hult (2005a, b), Gehrt *et al.* (2012), Hult *et al.* (2007) and Lim *et al.* (2009) studied the significant influence of e-business quality on customer behavioral intentions related to repurchase from a grocery e-tailer. Collier and Bienstock (2006) studied the influence of website ease on repurchase intention and satisfaction of customers and observed significant relationships. Other studies also showed a significant relationship between ease of website use and shopping satisfaction (Collier and Bienstock, 2006; Kim *et al.*, 2009; Lin and Sun, 2009; Pentina *et al.*, 2011; Thaichon *et al.*, 2014), repurchase intention (Lee *et al.*, 2011). In pure play e-tailing, customer's first encounter with e-tailer occurs with e-tailer's website. Since, there is no customer assistance available in pure play e-tailing as compared to multi-channel or brick and mortar stores; it is essential for the e-tailers to provide easy, smooth and friendly website to engage the customers in the shopping process. Hence, e-business quality may significantly affect the customer shopping satisfaction and repurchase intention. Thus, we propose the following hypotheses:

H1. E-business quality positively influences online shopping satisfaction.

H2. E-business quality positively influences repurchase intention.

Product quality

In e-tailing, customers cannot see, feel and touch the product. Several authors emphasized on perceived product quality, accurate product description, product information to account for product quality (Finch, 2007). Finch (2007) coined the term "product risk" to address the ambiguity in terms of the price and description of the product. Further, the role of product risk on logistics performance (Ramanathan, 2010), returns management and customer loyalty (Ramanathan, 2011b) was examined in the literature.

Product quality refers to the physical quality of the goods as perceived by the customer, the degree of choice or the assortment and the e-tailer's ability to keep the products in stock and/or make appropriate substitutions (Boyer and Hult, 2005a). Several authors found a significant relationship between product quality and shopping satisfaction (Liu *et al.*, 2008; Thirumalai and Sinha, 2005, 2011; Trabold *et al.*, 2006), customers' behavioral intentions (Boyer and Hult, 2005a, 2006) and customer loyalty (Heim and Sinha, 2001). Since customers cannot touch and feel the products in pure e-tailing as compared to offline retail store, it is very important for e-tailer to provide the following details to the customers to arrive at-purchase decision: complete product details/specifications; substitute products; search feature based on price, attributes and customer ratings, etc.; and depth and breadth of

assortment, i.e. product variety. In absence of sales assistance in e-tailing, customers may emphasize on this dimension while making the purchase decision. Therefore, we propose the following hypotheses:

H3. Product quality positively influences online shopping satisfaction.

H4. Product quality positively influences repurchase intention.

Order fulfillment dimensions

Order fulfillment in e-tailing involves the order pick, pack and shipping process, which was captured as PDSQ (Bienstock *et al.*, 1996; Rabinovich and Bailey, 2004), logistics service quality (Mentzer *et al.*, 2001) and operational order fulfillment service quality (Davis-Sramek *et al.*, 2008). Mentzer *et al.* (1989, 1999) discussed PDSQ in terms of three dimensions: availability, timeliness and condition. Koufteros *et al.* (2014) added billing accuracy and described it as an order fulfillment service quality construct. Thirumalai and Sinha (2005) studied customer satisfaction with order fulfillment processes across various product categories. Otim and Grover (2006) found that post-purchase services such as order-tracking, on-time delivery and customer support significantly influenced customer loyalty.

Previous studies (Mentzer *et al.*, 1989, 2001; Emerson and Grimm, 1996; Bienstock *et al.*, 1996) have considered various dimensions of PDSQ such as availability of products, timeliness of delivery, quality of delivery, order status information and order condition. However, most of these studies considered them in business-to-business context but they provide good insights in the context of pure e-tailing. We consider the following three dimensions of order fulfillment service quality: availability, timeliness and condition. Availability refers to inventory capability (Xing and Grant, 2006); timeliness accounts for timely delivery of products or services (Koufteros *et al.*, 2014) in e-tailing context. Condition refers to whether the products ordered arrived in good condition (Koufteros *et al.*, 2014). The customer expects that the right product is shipped without any damage within the promised delivery time window. Since customer cannot see product availability physically, it is very important that e-tailors ensure the availability of product in their fulfillment center as displayed on the website. Any mismatch or shortage of product at fulfillment center may lead to delay in shipment. On the contrary, if the right product is available in inventory, customer order can be fulfilled immediately and customer may feel happy receiving the message that order is packed and shipped. This may lead to higher customer satisfaction. Second dimension of the order fulfillment service quality is timely delivery. It is necessary for e-tailors to maintain timely delivery of the products as promised to their customers to increase the customer satisfaction. Many times, customer wants the product to be shipped on a particular day such as birthday or anniversary day and if they are not shipped on time, customer finds no value of that product. Hence, timely delivery plays an imperative role to turn customers happy and loyal. Therefore, e-tailors must track the order shipment and pass on the order status information to their customers on a timely basis. Condition of the product is a crucial dimension for the customers as they expect the shipped product to be non-defective and un-damaged.

Rao, Goldsby, Griffis and Iyengar (2011) and Rao, Griffis, and Goldsby (2011) developed the concept of electronic logistics service quality (e-LSQ) to investigate the relationship between e-fulfillment quality and customer retention using secondary data from www.bizrate.com. They found that customer satisfaction with respect to e-LSQ is positively related to customer's purchase satisfaction and customer retention. Various order fulfillment service quality variables are potent predictors of shopping

satisfaction (Kim *et al.*, 2009; Koufteros *et al.*, 2014; Lee and Lin, 2005; Rao, Goldsby, Griffis and Iyengar, 2011; Trabold *et al.*, 2006), repurchase intention (Posselt and Gerstner, 2005) and customer loyalty (Heim and Sinha, 2001). This leads to the following hypotheses:

- H5. Availability positively influences online shopping satisfaction.
- H6. Availability positively influences repurchase intention.
- H7. Timeliness positively influences online shopping satisfaction.
- H8. Timeliness positively influences repurchase intention.
- H9. Condition positively influences online shopping satisfaction.
- H10. Condition positively influences repurchase intention.

Reverse logistics

Product returns are typically higher in e-tailing and have always irritated e-tailers (Pyke *et al.*, 2001). Returns require logistics for not only receiving, inspecting, re-palletizing, repackaging and re-labeling the product but also integrating the inventory back into the system, and with reduced costs for customers and with additional logistics cost burden for the e-tailer. Ease of return refers to the process in which products are returned from the point of consumption to a retailer for possible repair, resale or recycling, etc. (Tarn *et al.*, 2003). Returns also represent the missed opportunity to manage customer relationships and build customer loyalty to the e-tailer (Mollenkopf *et al.*, 2007).

Ease of return is about how a retailer deals with damaged, unwanted or faulty products, how many channel options consumers have to return the products and how promptly products can be collected or replaced (Xing *et al.*, 2010; Xing and Grant, 2006). Mollenkopf *et al.* (2007) observed that product returns that require high levels of customer effort can have a negative effect on customer satisfaction with returns transaction. Mollenkopf *et al.* (2011) emphasized that returns management can also support the conflicting marketing-operations interface by utilizing the conceptualization of customer value and its related drivers. They proposed returns policy, returns processing, product quality, service support, personal interaction and supplier know-how as the value drivers of returns management. Jiang and Rosenbloom (2005) analyzed price and customer satisfaction at different stages of customers' intention to return products. Rao *et al.* (2014) explored the products returns arising from process attributes of PDSQ. Griffis *et al.* (2012) proposed that a returns policy may strongly influence future customer buying behavior. Mollenkopf *et al.* (2011) proposed that the management of product returns and reverse exchanges are important for cost reduction, customer acquisition and enhanced profitability for any organization. Several other studies established that effective management of product returns may lead to customer satisfaction (Heim and Field, 2007; Jiang and Rosenbloom, 2005; Reibstein, 2002) and may also lead to repeat purchase (Posselt and Gerstner, 2005; Griffis *et al.*, 2012) and customer loyalty (Heim and Sinha, 2001; Mollenkopf *et al.*, 2007). Thus, we propose the following hypotheses:

- H11. Ease of return positively influences online shopping satisfaction.
- H12. Ease of return positively influences repurchase intention.

Customers' aspects

Customer loyalty in e-tailing has been studied from the behavioral and attitudinal perspectives (Anderson and Srinivasan, 2003; Cronin *et al.*, 2000; Srinivasan *et al.*, 2002; Yi and La, 2004; Zeithaml *et al.*, 1996). Repurchase intention measures the attitude approach

of customer loyalty that includes repeat purchases and recommendations and is a good indicator of customer loyalty (Baldinger and Rubinson, 1996; Dick and Basu, 1994). Ha *et al.* (2010) contended that shopping satisfaction is a potent driver of repeat sales and customer loyalty. Anderson and Srinivasan (2003) defined e-satisfaction as the customer's contentment with his or her prior purchasing experience with the e-tailer. Yi and La (2004) claimed that shopping satisfaction is an antecedent to the repurchase intention. Thus, customers' repurchase intention and shopping satisfaction are relevant performance indicators in pure e-tailing.

As discussed previously, shopping satisfaction is an antecedent to repurchase intention (Mittal and Kamakura, 2001; Khalifa and Liu, 2007; Rose *et al.*, 2012). However, the link between shopping satisfaction and repurchase intention is more complex (Anderson and Srinivasan, 2003; Yi and La, 2004) in e-tailing context. This leads to the following hypotheses:

H13. Shopping satisfaction positively influences online repurchase intention.

The proposed framework shows e-fulfillment dimensions may mediate through shopping satisfaction for repurchase intention. It is hypothesized earlier that e-fulfillment dimensions positively influence the shopping satisfaction, i.e. shopping satisfaction of the customer for a particular e-tailer is derived from e-tailer's performance on these dimensions. Shopping satisfaction is also an antecedent to the repurchase intention. Hence, it is possible that accumulated shopping satisfaction of the customer can mediate the relationship between e-fulfillment dimensions and repurchase intention, e.g. one delayed shipment can influence the repurchase intention of the customer heavily but impact can be contained with the help of higher shopping satisfaction gained during previous purchases. This leads to the following hypotheses:

H14. Shopping satisfaction has a mediating effect between e-fulfillment dimensions and online repurchase intention.

Conceptual framework

E-fulfillment is one major area of e-tailers' operations, which significantly influences customers' shopping experience (Koufteros *et al.*, 2014; Lee and Lin, 2005; Thirumalai and Sinha, 2005) and repurchase intention (Koufteros *et al.*, 2014; Posselt and Gerstner, 2005). Rabinovich and Bailey (2004) studied service quality aspect of order fulfillment and suggested three dimensions (availability, timeliness and condition). While, Mentzer *et al.* (1989, 1999) excluded reliability and considered condition dimension. Xing and Grant (2006) and Xing *et al.* (2010) extended Mentzer *et al.*'s (1989, 1999) framework by adding ease of return as the fourth dimension. While Koufteros *et al.* (2014) added billing accuracy as the fourth dimension of order fulfillment service quality and studied influence of all the four dimensions on encounter satisfaction in e-tailing. However, these studies did not include the order procurement dimensions (e-business quality and product quality) of the e-fulfillment process. Boyer and Hult (2005a, b) focused on IT, operations and marketing aspects of grocery e-tailers considering e-business quality, product quality and service quality dimensions. They found strong relationship amongst these dimensions and customer behavioral intentions and number of purchases. However, these studies (Boyer and Hult, 2005a, b) did not consider the various aspects of service quality.

The literature review shows that previous studies proposed standalone frameworks examining a certain part of e-fulfillment process and tested effect of few relevant e-fulfillment dimensions on certain aspects of the customer. However, study involving all the dimensions of e-fulfillment (e-business quality, product quality, timeliness, availability, conditions and ease of returns) and their influence on the customers is currently missing in the literature. Few authors have considered these dimensions

but operationalized them using secondary data sources such as Bizrate.com. There is a need to build an integrated e-fulfillment framework to examine the customer expectations from entire e-fulfillment process using primary data. With better understanding of relative influence of these e-fulfillment dimensions, the integrated framework will help e-tailer to focus on improvement in certain areas of e-fulfillment process to enhance customer satisfaction.

We consider the entire process of e-fulfillment as described by Pyke *et al.* (2001) and use the classification shown in Figure 1 to arrive at six e-fulfillment dimensions in the context of pure play e-tailing. We propose a conceptual framework to study the influence of these six dimensions on shopping satisfaction and repurchase intentions of the customers. The framework is shown in Figure 2 and described below in detail.

E-fulfillment framework is developed using *H1-H14* proposed earlier. Customer acquisition (Lewis, 2006) and retention (Reichheld and Schefer, 2000) are centrally focused in e-tailing; there is a need to understand the influence of various e-fulfillment dimensions on customers in order to serve them well. The framework would help to empirically test the direct effect of various e-fulfillment dimensions on online shopping satisfaction and repurchase intention of the customers. It would also help to empirically test the mediating effect of online shopping satisfaction on the relationship between e-fulfillment dimensions and repurchase intention of the customer. As described previously, this framework is helpful to e-tailers to measure their existing performance on the six e-fulfillment dimensions (e-business quality, product quality, availability, delivery timeliness, shipment condition and ease of return) as perceived by their customers through questionnaire survey. This framework can further help them understand the importance of various dimensions to enhance the shopping satisfaction and repurchase intention of the customers.

Discussion and future research scope

The literature review showed that previous studies considered merely one or a very few dimensions of the e-fulfillment process. Some authors studied order procurement dimensions (e-business quality and product quality) and order fulfillment dimensions

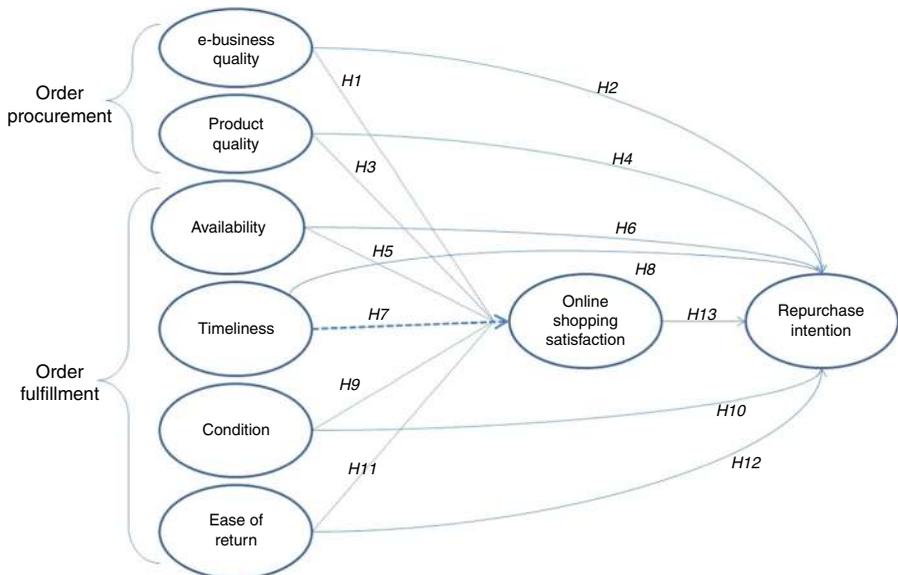


Figure 2.
Conceptual framework

(availability, timeliness, conditions and returns) separately. Heim and Sinha (2001) first attempted to put together an integrated framework that included all e-fulfillment dimensions and studied its impact on customer loyalty. Some of these dimensions were established and tested out in different settings such as e-commerce, internet retailing and multi-channel retailing. This clearly establishes the dire need to holistically provide and test various dimensions of e-fulfillment in the context of pure e-tailing. This study will help pure play e-tailers develop intrinsic detailed insight into various dimensions of e-fulfillment and its links with customer expectations. Thus, this study enables pure play e-tailers to differentiate by focusing on these dimensions in the cut-throat competitive e-tailing market.

Customer acquisition (Lewis, 2006) and retention (Reichheld and Scheffer, 2000) are the central focus in e-tailing; there is a need to understand the influence of various e-fulfillment dimensions on customers in order to serve them well. Previous studies tried to establish the influence of few and not all e-fulfillment dimensions on customers' behavior (Boyer and Hult, 2005a; Davis-Sramek *et al.*, 2008; Hult *et al.*, 2007) and attitude (Koufteros *et al.*, 2014; Lin and Lekhawipat, 2014). There was no attempt to integrate all e-fulfillment dimensions and test its influence on various aspects of customers in total. Such an integrated framework will help pure play e-tailers devise the right e-fulfillment strategy by focusing on certain important e-fulfillment dimensions.

Previous studies empirically tested their frameworks/constructs mainly using secondary data that captured customer feedback from various rating websites such as www.bizrate.com (Thirumalai and Sinha, 2005, 2011), epubliceye.com (Ramanathan, 2010, 2011a, b), etc. Limited empirical studies based on primary surveys have been carried out in this stream. There is a need to empirically test the proposed framework using primary data from the customers' perspective. Future research can be carried out to empirically test the proposed hypotheses and to analyze the linkage of these dimensions on the shopping satisfaction and repurchase intention of customers. This can provide more insights into how customers perceive various dimensions of e-fulfillment for a pure e-tailer.

There is also a need to examine the robustness of the relationship between the e-fulfillment dimensions and its influence on customers. Limited research has explored the relationships in the presence of external variables such as gender, income, age, shopping frequency, transaction recency, etc. Mediating analysis of shopping satisfaction between e-fulfillment dimensions and repurchase intention, customer loyalty, etc. is likely to yield additional valuable insights into e-fulfillment. Further investigation of the moderating role of customer trust, product type and demographics may provide meaningful insights into e-fulfillment that can significantly contribute to the existing knowledge domain. Pricing (Lewis, 2006; Lewis *et al.*, 2006) is another important order procurement dimension that can influence customers for repeat purchases from the same e-tailers. Certain fulfillment dimensions like discounts, product tracking, information asymmetry between seller and e-portal, 3D product visualization and virtual try-on solution can be further explored for robust and holistic framework.

Further, most studies on e-fulfillment focused on the customer base in developed countries where organized retail and online retail markets are more mature, and garner a larger share of the total retail market. However, in developing countries, online retail is in nascent stage due to lack of IT infrastructure and poor logistics network. This further provides an opportunity for academicians to test the integrated framework between developing and developed countries in order to get deeper insights of the customers regarding their e-fulfillment dimensions. Such insights could be useful to global e-tailers to design and improve their e-fulfillment operations globally by making them more customer centric locally.

Managerial insights

Sound understanding of the critical e-fulfillment dimensions and their links to customers' behavior and attitude will enable pure e-tailers to differentiate them in the crowded and extremely competitive e-tail market.

E-business quality is an important dimension of e-fulfillment and measures e-tailers' website-related features. E-tailers consider website as their strength and the area where they can make biggest improvements in customer experience[1]. E-tailers that offer superior e-business quality (Boyer and Hult, 2005a, b; Collier and Bienstock, 2006) can easily convert first-time buyers into loyal customers. Product-related features are measured by product quality. E-tailers that provide high-quality goods, a different variety of products and a better assortment (Boyer and Hult, 2005a, b) will retain customers. E-tailers are creating "virtual fitting rooms" to provide detailed sizing information to the customers and thus enhance reliability in online shopping and reduce returns as well (Euromonitor International, 2014).

E-tailers should provide accurate product availability information (Heim and Sinha, 2001) and alternatives/substitutions (Boyer and Hult, 2005a) when the desired product is out of stock to convince the customer to purchase the product online. Timely delivery (Xing and Grant, 2006; Xing *et al.*, 2010) of products and good condition (Koufteros *et al.*, 2014) of the products on arrival are important order fulfillment dimensions for gaining customer trust and loyalty. These PDSQ dimensions should be met by e-tailers or their logistics service providers for enhancing customer acquisition and customer retention (Xing and Grant, 2006; Xing *et al.*, 2010, 2011). E-tailers have started speeding-up delivery commitments by offering click and collect options, building more fulfillment centers, coordinating and collaborating with store-based-retailers, and couriers for direct shipping of products to the customers (Euromonitor International, 2014).

Academicians have separately studied returns policy or process *vis-à-vis* customers' actual experience on returning a product. Mollenkopf *et al.* (2007) developed a construct, "return satisfaction" to measure customer satisfaction about returning a product and established it as a mediator between service recovery quality and customer loyalty. However, mediating or moderating the impact of returns satisfaction between returns (returns policy offered by an e-tailer) and various customer aspects such as shopping satisfaction, repurchase intention, word of mouth, etc. should be studied further.

Convenient delivery and collection options, competitive delivery and easy returns are significant operations and logistics performance dimensions on which customers value e-tailers (Wright, 2016). Superior website features, concrete product-related information, prompt and smooth delivery of shipments in good condition and liberal returns policies will help e-tailers to acquire and retain the customers. This study will also help pure play e-tailers identify broader areas of investment and improvement in designing customer-centric e-fulfillment architecture.

Conclusion

This study presented a critical and systematic review of the vast literature on the e-fulfillment process in e-tailing. E-fulfillment dimensions were divided into two categories: order procurement dimensions (e-business quality and product quality) and order fulfillment dimensions (availability, timeliness, condition and reverse logistics). A conceptual framework was proposed to empirically test the impact of e-fulfillment dimensions on customers' shopping satisfaction and repurchase intention. The proposed framework suggests that e-tailers not only be aware of e-fulfillment dimensions but also its linkages with shopping satisfaction and repurchase intention of the customer during the service encounter. This framework will help e-tailers to focus on improving certain e-fulfillment dimensions to enhance customer experience that may help them to retain the

customers in the long term. Consumer research should focus on meeting the customer expectations during pre-purchase, at-purchase and post-purchase processes with the understanding of how to benchmark and improve the e-fulfillment dimensions.

Several gaps were identified as future research directions in order to gain deeper insights into e-fulfillment. The framework may help e-tailers to identify areas/dimensions for investment and improvement to meet the customer expectations. This study helps e-tailers, academicians and practitioners understand critical dimensions of the e-fulfillment process and its influence on customers in the pure play e-tailing setting in order to give customers an enhanced shopping experience and thus create value for e-tailers.

Note

1. "Customer Experience", Internet Retailing Research Report 2014.

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Appendix

Author	Order procurement			Order fulfillment			Customer aspects			Word of mouth		
	E-business quality	Product quality	Availability	Timeliness	Condition	Reverse logistics	Online shopping satisfaction	Behavioral intentions	Purchase intention/behavior		Repurchase intention	Customer loyalty
Audrain-Pontevia <i>et al.</i> (2013)							•					
Bauer <i>et al.</i> (2006)	•	•	•	•	•	•						
Bienstock <i>et al.</i> (1996)			•	•	•							•
Boyer and Hult (2005a)	•	•						•				
Boyer and Hult (2005b)	•	•						•				
Boyer and Hult (2006)	•	•						•				
Boyer and Olson (2002)	•	•				•						
Chiu <i>et al.</i> (2014)	•	•				•				•		
Chuang <i>et al.</i> (2006)	•	•				•	•					
Collier and Bienstock (2006)								•				
Gao and Bai (2014)	•											
Griffis <i>et al.</i> (2012)	•											
Harris and Goode (2004)	•											
Heim and Field (2007)	•	•				•						
Heim and Sinha (2001)	•	•				•						
Holloway and Beatty (2008)	•					•						
Huang and Oppewal (2006)	•					•						
Hult <i>et al.</i> (2007)	•	•				•						
Jiang and Rosenbloom (2005)	•	•				•						

(Continued)

E-fulfillment dimensions

Table A1. Review of the literature

Table AI.

Author	Order procurement		Order fulfillment			Customer aspects			Word of mouth			
	E-business quality	Product quality	Availability	Timeliness	Condition	Reverse logistics	Online shopping satisfaction	Behavioral intentions		Purchase intention/behavior	Repurchase intention	Customer loyalty
Kaur and Khanam Quareshi (2015)		•							•			
Khalifa and Liu (2007)							•			•		
Kim <i>et al.</i> (2009)	•	•	•	•	•		•	•				
Koufteros <i>et al.</i> (2014)							•					•
Lee and Lin (2005)	•						•			•		
Lee <i>et al.</i> (2011)	•						•					
Lim <i>et al.</i> (2009)	•	•					•					
Lin and Lekhawipat (2014)												
Liu <i>et al.</i> (2008)	•	•					•					
Liu <i>et al.</i> (2013)	•	•					•					
Massad <i>et al.</i> (2006)	•	•					•					
Mentzer <i>et al.</i> (1989)												
Mentzer <i>et al.</i> (1999)												
Mittal and Kamakura (2001)												
Mollenkopf <i>et al.</i> (2007)	•											
Mollenkopf <i>et al.</i> (2011)												
Morganosky and Cude (2000)	•											
Morganosky and Cude (2002)	•											
Otim and Grover (2006)	•	•										•

(Continued)

Author	Order procurement		Order fulfillment			Customer aspects			Word of mouth			
	E-business quality	Product quality	Availability	Timeliness	Condition	Reverse logistics	Online shopping satisfaction	Behavioral intentions		Purchase intention/behavior	Repurchase intention	Customer loyalty
Ozen and Engizek (2014)							•					
Pappas <i>et al.</i> (2014)							•					
Parasuraman <i>et al.</i> (2005)	•	•	•	•	•	•						
Park and Kim (2003)	•	•							•			
Pentina <i>et al.</i> (2011)	•						•					
Posselt and Gerstner (2005)	•	•	•	•	•	•	•			•		
Rabinovich and Bailey (2004)			•	•	•	•						
Rabinovich <i>et al.</i> (2003)		•	•	•	•	•						
Rabinovich <i>et al.</i> (2007)		•	•	•	•	•						
Rabinovich, Maltz <i>et al.</i> (2008)			•	•	•	•						
Rabinovich, Rungtusanatham <i>et al.</i> (2008)			•	•	•	•						
Rabinovich <i>et al.</i> (2011)						•						
Ramanathan (2010)	•	•	•	•	•	•						
Ramanathan (2011a)	•	•	•	•	•	•					•	
Ramanathan (2011b)	•	•	•	•	•	•						
Rao, Goldsby, Griffis and Iyengar (2011)			•	•	•	•			•			•

(Continued)

Table AI.

About the authors

Nikunj Kumar Jain is working as an Assistant Professor in the department of Operations and Quantitative Methods, International Management Institute, New Delhi, India. He holds a Fellow Program in Management from the Indian Institute of Management Indore, India and a BTech in Electrical Engineering from the MANIT, Bhopal, India. He has three years of work experience in a grass root refinery project at Bharat Oman Refineries Ltd Bina, District Sagar, India. His research interests include retail operations, mathematical modeling and supply chain management. He has presented papers in national and international conferences.

Hasmukh Gajjar is working as an Associate Professor at the Indian Institute of Management Indore, India. He holds a PhD Degree from the Shailesh J. Mehta School of Management, Indian Institute of Technology Bombay, India. He is a Graduate in Mechanical Engineering and an MBA in Operations Management. He has more than ten years of work experience in the field of Operations Management. His research work on retail shelf space allocation has been already accepted in the leading journals like *Annals of Operations Research*, *Asia-Pacific Journal of Operational Research* and *International Journal of Retail & Distribution Management*. His research interests include retail operations, modeling and optimization. Hasmukh Gajjar is the corresponding author and can be contacted at: hasmukh@iimdr.ac.in

Bhavin J. Shah is working as an Associate Professor in the area of Operations Management and Quantitative Techniques at the Indian Institute of Management Indore. He holds PhD Degree in Operations Research and has published research papers in the area of inventory modeling, perishable inventory systems and supply chain revenue sharing models. His current area of research interest includes supply chain modeling, perishable inventory systems, revenue sharing models in coordinated supply chains, service management, logistics management, business model generation and validation, simulation studies, management control systems, healthcare delivery systems, hospital management, project management, and case research.

Ashish Sadh is a Professor of Marketing at the Indian Institute of Management, Indore, India. He has been teaching in the postgraduate programme, executive postgraduate programme and management development programme of the Institute. He is a Visiting Faculty with the Asian Institute of Technology, Bangkok and is very actively involved in the training and consultancy projects for public, private and government organizations within and outside India. His research interests include brand management, advertising management and social marketing.

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