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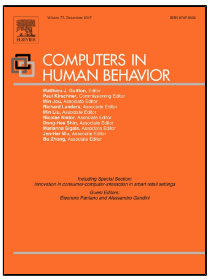

Investigating the Effects of Smart Technology on Customer Dynamics and Customer Experience

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Highlights

- Commitment to learn has an effect on customer participation and dynamics
- Customer dynamics have an effect on customer experience in a retail environment
- Impacts of customer behavioural intention on customer participation and customer dynamics
- Smart technologies affect the traditional customer decision making process in a retail context

Investigating the Effects of Smart Technology on Customer Dynamics and Customer Experience

Abstract

Increased use of smart technologies by customers is leading to recognition of their influence on the shopping experiences of customers by practitioners. However, the academic literature fails to acknowledge the influence of smart technology usage, combined with behavioural intention of the customer, on the dynamics and experience of customers. This research utilises explanatory research at the preliminary stage to examine this phenomenon in a retail setting. A conceptual framework was created, based on the scholarly knowledge available in extant literature, and was tested using a survey of a convenience sample of 330 consumers shopping in a high-end retail store in London, United Kingdom. Structural Equation Modelling (SEM) via AMOS was employed to test the proposed model. This study contributes to technology adoption based consumer behaviour literature, by explaining the ability of learning commitment to drive the participation of an individual, but its inability to influence their behavioural intention. Findings of this research also reflect on the role of customer dynamics and customer experience in embracing innovative application of smart technologies in a retail setting. The results and implications included in our study also contribute to the understanding of the determinants that affect customer dynamics and customer experience when making use of smart technologies.

Keywords: Customer Experience; Customer Dynamics; Behavioural Intentions; Smart Technologies; Technology Adoption

1. Introduction

The rapid proliferation and use of smart technologies (e.g. smart mobile phones, tablets, wearables etc.), which was once predominantly a trend amongst the younger generation, is becoming widely accepted by all parts of society (Grewal et al., 2017). In this context, a technology is referred to as 'smart' when it is an electronic device or system that can be connected to the internet and used interactively. With society having turned more tech- and internet-savvy (Immonen and Sintonen, 2015), people now have the chance to experience efficient services provided by organisations. This trend has resulted in consumers expecting targeted, more responsive, and equally efficient services from retailers and other businesses.

Retailers have embraced the concept of customer experience management, with many incorporating the notion into their business mission statements. Equally, retailers around the globe, including Europe, are aware of the new possibilities that smart technologies have to offer in their retail environment (e.g. Smart Labels and Unique Identifiers, NFC payments) and have started exploring them (Pantano, 2014). According to Barthel et al. (2015), one of the key drivers in retail is an increasing demand for a seamless experience between online, mobile and in-store shopping. The creation of a superior customer experience is asserted to be one of the pivotal objectives in retailing environments whether it be offline (Verhoef et al., 2009) or online (Chang et al., 2016). According to a report by McKinsey, these disruptive technologies are forecast to have a $6.2 trillion effect on the world economy by 2025 and one of the key industries that this will impact will be retail (Manyika et al., 2013). However, the possibilities are far more than simply introducing or making use of new technologies, as this phenomenon in the retail environment has opened up challenges and opportunities at the same time for the retailers (Grewal et al., 2017). Therefore, it is important that the retailers assess the real value and the changes that the use of smart technologies can have on consumer dynamics and creating a new customer shopping experience, based on all the interactions and thoughts about the business (Verhoef et al., 2009; Oh et al., 2007).

Despite the emergence of smart technologies and the recognition by practitioners of their importance in influencing new shopping experiences, the academic literature investigating this topic has been limited. Publications on customer experience are mainly found in practitioner-oriented journals or management books (Meyer, 2007; Shaw and Ivens, 2005). Furthermore, the extant literature (e.g. Frow and Payne, 2007; Gentile et al., 2007)

primarily focuses more on managerial actions and outcomes, rather than on the theories underlying the antecedents and consequences of customer experience. To date, rigorous empirical studies investigating the value of the new consumer shopping experiences and changes in consumer dynamics triggered by smart technologies are still limited. The purpose of this study is therefore to investigate the effect of an individual's commitment to learn combined with their behavioural intention on customer dynamics and their retail shopping experience, in the context of the innovative application of smart technologies.

Drawing on the literature focusing on consumer behaviour particularly customer participation, this research proposes that customer dynamics (e.g. searching, comparing, evaluating) may account for an impact on customer experience. In doing so, it provides insight for the retailers and managers into the value created by the use of smart technologies in the retail environment and the implications for the customer shopping experience. Two primary research questions were developed to aid managers in understanding customer dynamics and experience in a retail environment influenced by the use of smart technologies. The first question asked was: Does commitment to learn and behavioural intentions such as social influence, perceived value, etc. have an effect on customer participation and dynamics? Second, does customer dynamics have an effect on customer experience in a retail environment influenced by the use of smart technologies? If there were a substantial effect, retail managers need to understand the important role that customer dynamics has on customer experience.

In order to address the research aim and questions, this paper first reviews the extant literature of the customer experience in a retail environment as part of section 2 (Conceptual Background). Section 3 then presents the research model along with the proposed hypotheses. The following section 4 reports the research method and section 5 reports the data analysis and findings. The final sections (section 6 and 7) of the paper presents a discussion with conclusion, which highlights the key findings, the research implications to both theory and practice, the limitations of this study and recommends future research directions. This study will be of significance to the ICT research community and to retail practitioners.

2. Conceptual Background

2.1 Customer Experience in a Retail Environment

Undoubtedly, customer experience (CE) plays a significant role in determining the success of a company's offering (Yakhlef, 2015; Gentile et al., 2007). Organisations have used both tangible products and intangible services to generate unforgettable events for consumers (Chen and Lin, 2015; Tsaur et al., 2007; Pine and Gilmore, 1998). According to Schmitt (1999), customer experience is defined as the perception or acknowledgment that follows from the stimulated motivation of a consumer who observes or participates in an event which can enrich the value of services and products. The scholarly literature on CE is abundant and the debate between practitioners and scholars is very active. Over the last few decades, the researchers on retail marketing have taken a keen interest in how in-store retail environments influence the consumer experience (Yakhlef, 2015; Verhoef et al., 2009; Naylor et al., 2008; Sousa and Voss, 2006; Schmitt, 2003; Bitner, 1992; Belk, 1988). More recently, as the number of contact points between a business and its customers has increased, especially with the rise of smart technologies, such attention to the customer has revealed the essential importance of monitoring the many experiences that are created from those contact points. Such experience plays a significant role in influencing the consumers' preferences, which then impact on consumers' purchase decisions.

A recent study by Anderson and Bolton (2015) highlighted the importance of the use of smart technologies such as sensors and radio-frequency identification (RFID) within the retail sector, to capture data to be interpreted for retail acumen. The sensors capture simple data sets, such as the number of customers who have walked through a doorway or down an aisle, to more complex data, such as demographic or behavioural data. For a retailer, this provides an opportunity for analysing a rich source of information to facilitate optimizing the customer experience and thereby improves sales (Anderson and Bolton, 2015).

According to Pantano and Timmermans (2014), the implementation of smart technologies in retailing necessitates modifications in both selling activities and businesses processes. The authors highlight that from an organisational point of view, smart technologies require an effort for recognizing, selecting and presenting the finest technology, while enhancing the way to generate, obtain, manage and transfer knowledge from customers to companies and vice versa. As a result, highlighting the importance of commitment to learn as well as leveraging the appropriate smart technologies has become essential. Scholarly studies

such as Jeppesen and Molin (2003) and Jeppesen (2002) advocate that education and innovation efforts from which a company may gain advantage need not essentially be located within the business and may well reside in the customer environment. By using smart technologies, a smart partnership between customer and retailer, after the in-store adoption, is created. At the same time, there is a need for retailers to understand the consumers' demands and their behavioural intentions (Chang et al., 2016) such as customers' perceived value and effort expectancy (Teo and Lim, 2001; Cronin et al., 2000), which is also aided by the introduction of smart technology.

2.2 The Dynamics of Customer Experience

Marketing and chief executives' agendas have recognised the importance of understanding and enhancing the customer experience, in retail fields and consumer packaged goods manufacturing (Grewal et al., 2009) which remains a critical field for academic studies. As highlighted by Pantano and Timmermans (2014), the relationship between customers and retailers is strengthened by emotional engagement, easily used and interactive interfaces, and entertaining devices, which allow customers and retailers the dynamic visualisation of information. So, the use of technology becomes smart by connecting retailers and clients with the mutual goal of achieving better customer dynamics and customer experience (Ostrom et al., 2015; Ahmadinia et al., 2015) Customer Dynamics (CD) in this context refers to the flow of searching, comparison and evaluation activities that takes place between a customer and the retailer (Lemon et al., 2002; Douglas and Craig, 1997). This research elaborates on the emerging strategies for creating dynamic customer experiences in a retail environment leveraging smart technologies. For example, Table 1 below provides some of the customer solutions provided by retailers that influence the customer dynamics and experiences.

<<Please Insert Table 1>>

Our arguments are embedded widely in the literature that discusses the behaviour of consumers in the retail environment, to emphasise that consumers will progressively hold control in the fast-changing digital environment (Anderson and Bolton, 2015; Naylor et al., 2008; Sousa and Voss, 2006; Schmitt, 2003). The studies supporting our point of view also

stress the ability of retailers to get to grips with the implications of converging technologies. Therefore, initiating a discussion on how important it is for retailers to make sense of consumer behaviour as they demand a smart retail experience is timely and significant. The recent shifts in behaviour of consumers may be daunting for retailers unless they are able to embrace the changes in customer dynamics and provide the experience demanded by their customers. Therefore, the key for retailers in such an environment will be to keep a close eye on customer behaviour and their changing habits in an online setting (including increased use of comparison engines) which will affect their business.

3. Research Model and Hypotheses Development

This research links behavioural intentions (e.g. social influence, perceived value etc.) of individual customers with their commitment to learn (Petkus, 2010) and explores if together they can have an influence on customer intention to participate in the adoption of smart technology and the dynamics of individuals participating, so as to improve their experience in a retail setting (Figure 1).

Weijters et al. (2007) reviewed a model of self-service technology adoption by customers in a retail setting with the purpose of improving service quality and cost reduction for improved productivity. The authors tried to identify antecedents and consequences of customers' motivation to use self-service technologies, a type of smart technology using survey and observational data following the self-scanning methodology adopted by Dabholkar et al. (2003). Using cross-sectional survey data, collected from six grocery stores in Western Europe by six teams of research associates during a three-day period, enabled the authors to measure the ability of customers' attitude towards the use of technology to drive actual use, their satisfaction and the number of items purchased while they spent time in store. Although this research explains the use of technology in the context of our research, it does not reflect on the links conceptualised by us between customers' participation in the adoption of smart technology and their commitment to learn. Plouffe et al. (2001) compared the intentions of customers towards adoption of technology in a multi-group customer setting to understand how they jointly adopt innovation for success. Keeping a focus on financial services being offered by the retail sector, the authors tried to evaluate technology adoption by 350 consumers and 250 retailers and examined how these two groups were different from

each other based on the parameters of 1) relative advantage defined as a clear comparative advantage and 2) compatibility defined as degree of fitment of product to current preferences. Their findings indicate that the notion of control over their adoption decision is important for consumers, whereas the intention of retailers was driven by the potential of the adoption to add value to their bottom line. This research explains technology adoption by consumers. However, it fails to explain how much influence customers' commitment to learn a new technology can have on their technology adoption. Hence, it becomes important to hypothesize from the point of view of our research that:

H1: Customers' participation in adoption of smart technology in a retail setting is driven by customers' commitment to learn.

A research conducted by Nguyen and Barrett (2006) investigated the intention of firms to adopt technology-based practices using data collected from 144 export firms in Vietnam. The application of the technology acceptance model (TAM) enabled the authors to explain that perceived usefulness, however not perceived ease of use, of the internet is a strong predictor of intention to adopt technology based services and processes. Their findings further emphasised the role of market orientation on the intention of customers to adopt technology when mediated by perceived usefulness. Li et al. (2006) explored the link between behavioural intentions of customers towards technology adoption and their level of commitment towards websites. Authors associated trust held by an individual with the behavioural intention of customers to understand customer retention and customer decision-making strategies. They derived their results from data collected from 335 respondents to reflect upon different types of commitment, such as affective commitment and calculative commitment, other than the quality of alternatives available to customers. In another study, Jeppesen and Molin (2003) place emphasis on developments of interactive learning in the customer community that enables consumer innovation. Venkatesh et al. (2003) highlight social influence, performance expectancy, effort expectancy, and facilitating conditions as key factors that influence behavioural intention. Ajzen (2002) measured perceived behavioural control using two components of (1) perceived self-efficacy/perceived value and (2) perceived controllability. The source of perceived value as a component of customer

intention to use internet space is based on the security issues model proposed by Daniel and Jonathan (2013) and Hutchinson and Warren (2003).

The study by Petkus (2010) highlights how the effect of consumer activity such as interactive learning and behavioural intention to learn can result in high value to the firm in the context of computer game development. Authors of studies such as Jeppesen and Molin (2003), Petkus (2010), Nguyen and Barrett (2006), Gounaris (2005) or Keh and Xie (2009) have discussed links between customer commitment and behavioural intention in different settings; however, they have not been able to establish the link between commitment of customers to learn and their behavioural intentions. The current literature (Daniel and Jonathan, 2013; Hutchinson and Warren, 2003; Urumsah, 2015) fails to use the components of behavioural intention in the context of internet retail setting. To fill this gap in the literature, we hypothesize that:

H2: Behavioural intention of customers to adopt smart technology in a retail setting identifies the extent to which customers are committed to learn.

Authors like Vijayasarthy (2004) used the theory of reasoned-action and the technology adoption model to explain the intentions of customers to use on-line shopping facilities. The study revolved around variables like ease of use, usefulness, privacy, compatibility, security, normative belief and self-efficacy. Data received from 281 consumers and variables investigated by them were found to be important predictors of behavioural intentions towards on-line shopping. Makarem et al. (2009) examined factors that determine customer satisfaction in technology enabled service encounters to understand if technology or touch based service processes had any influence on the behavioural intentions of customers considering changing interactions between employees of a company and its customers. Using data collected through an administered survey followed by use of qualitative data for expert insights, the authors established that customer satisfaction in technology enabled service encounters can be linked to positive behavioural intentions of customers. Although this study explains the link between level of participation of the customer and their adoption of smart technology, it has not explained how it is able to influence behavioural intentions of customers. Also, based on previous studies such as Lemon et al. (2002) and Douglas and Craig (1997), we understand that consumer dynamics is the flow of activities such as

searching, comparison and evaluation, which takes place between a customer and the retailer. These research studies are, however, unable to explain why dynamics of customers when driven by smart technology adoption have the ability to affect their behavioural intentions; it did not consider technology adoption by customers in a retail setting. Considering tis gap in the academic literature, we would like to examine the extent to which:

> *H3: Customers' participation in adoption of smart technology in a retail setting is driven by customers' behavioural intentions.*

A study conducted by Snape and Rynikiewicz (2011) investigated energy consumption behaviour of customers based on their dynamics for a complex and adaptive smart electricity grid system. The grid system studied was comprised of physical networks, economic markets and multiple agents interacting with each other. This study investigates the practices and trajectories associated with the behavioural and cognitive norms of these agents and other actors working within the system. Using an agent-based model developed by the authors, this study explained how social learning and individual behaviour impact energy use and energy saving patterns. Another recent investigation by Ahn et al. (2016) tried to understand sustainable living of consumers by looking at the expanding range of technologies being employed in residential settings. The authors tried to identify factors that can link the adoption of sustainable household technology with product developers, policy makers and product marketers for reducing the impact of domestic pollution on the environment. Using the united theory of acceptance with use of technology, Ahn et al. (2016) developed a model based on an online survey which they conducted with 592 consumers. Findings from the structural model explain how expectancy of efforts with social pressure and environmentalism alone cannot predict the adoption intention of consumers. This study used items related to product attributes of sustainable household technology such as compatibility, performance, and hedonic expectancy and customer characteristics. Although these studies have looked at adoption of smart technology by consumers, they have ignored how the link between dynamics of consumers, when viewed using the AIDA model previously applied in online settings by Hassan et al. (2015) from a small businesses perspective, can drive behavioural intentions of customers who adopt smart technology in a retail setting or for tourists using internet blogs (Lin and Huang, 2006). To push existing knowledge about

capability of customer dynamics to drive their behavioural intention based on their adoption of smart technology, we hypothesize that:

H4: Dynamics of customers when driven by adoption of smart technology in a retail setting can drive behavioural intention of customers.

The technology acceptance model (TAM) has enabled researchers to explain the adoption and acceptance of technology by customers (Mallat, 2007; Mattila et al., 2003; Mittal and Lassar, 1998). Ha and Stoel (2009) used this model to integrate e-shopping quality, trust, and enjoyment and collected data from 298 college students to understand the quality of apparel products based on its four dimensions - i.e. 1) web site design, 2) privacy/security dimension, 3) atmospheric/experiential dimension and 4) customer service. Their structural model revealed the extent to which e-shopping quality determines the perceptions of customers about the usefulness of a website, trust and enjoyment in relationship to the website. Out of these factors, the authors identified shopping enjoyment and trust as having high significance in technology adoption by customers. Similarly, the use of technology to facilitate shopping was studied in the context of disenfranchised customers by Walker et al. (2002). This research investigated the potential benefits of technology based services to customers and providers alike based on the concept that it all depends upon the purpose to which technology is put and the manner in which it is used. Considering a balanced approach between operational desirability, personal capacity, willingness and experiences of individuals based on their behavioural intentions and perceptions, the authors tried to predict whether customers would adopt or reject a technology. A research by Ngo and O' Cass (2013) revealed that customer participation is the degree of consumers' involvement and effort, both physical and mental, essential to participate in an activity. Existing studies other than the ones discussed above, like Neuhofer et al. (2015) or Casey and Jones (2013) or Holgado and Macchi (2014), however, do not discuss the hidden link between customer participation, dynamics of customers and customer experience. To fill this gap in the current understanding of academics about this phenomenon, we hypothesize that

H5: Dynamics of customers when driven by adoption of smart technology in a retail setting is driven by customers' participation.

Influence of smart technology on experience of customers has been studied many times by scholars such as Hsu and Lu (2004). Considering on-line games as entertainment technology for consumers, Hsu and Lu (2004) collected data from 233 users to understand the impact of belief related constructs that consisted of social influence and flow experience on their perceptions of online games. Using a technology acceptance model, analysis of the study by Hsu and Lu (2004) found that social norms, attitude and flow experience explain game playing as predictors of entertainment oriented technology adoption. Another research conducted by Wu and Wang (2005) tried to evaluate indicators of mobile commerce adaptation by consumers using a technology adoption model. Authors of this research integrated concepts related to consumer dynamics using innovation diffusion theory, perceived risk and costs, to determine mobile commerce acceptance by consumers.

Using data collected through a survey of mobile commerce consumers, Wu and Wang (2005) performed confirmatory factor analysis on a causal model of mobile commerce acceptance and found that 'compatibility' had a strong influence, unlike 'ease of use', which did not have a strong impact on the behavioural intent of users. Definition of compatibility used by Wu and Wang (2005) considered the degree of consistency on whether innovation is perceived to be compatible with values, experiences, and needs of users. The authors also reflected on the influence of factors such as slow connections, poor quality of connection, out of date content, apart from missing errors and links, on frustrating experiences of customers in an online setting. Cocosila and Igonor (2015) hypothesize about the social value dimension from an image, social presence, critical mass and social norm perspective in their empirical study investigating the adoption of Twitter social networking application. In general, these studies have looked at consumers and users in online settings but they have missed the causality between dynamics of consumers and their experiences of smart technology adoption in a retail setting. To fill this gap in the existing literature, we hypothesize that:

H6: Dynamics of customers when driven by adoption of smart technology in a retail setting can drive customer experience.

<<Please Insert Figure 1>>

4. Methods

4.1 Data collection

The idea of changes in consumers' dynamics and the influence of smart technology on customer experience could not be examined without referencing particular retailers and asking for customer comment. Therefore, a particular company is referenced on the assessment survey (Elsbach and Bhattacharya, 2001) for evaluating the retailer. The retailer was chosen via in-depth assessment of brand presence for a major London-based chain store brand which has many customers, is also a recognized brand and a traveller destination. This retail store enjoys an optimistic reputation, which relates to its retail brand name (Dennis et al., 2014; Gupta et al., 2010). In a survey, 620 questionnaires were sent to the retailer employing a convenience sample. However, 330 adult customers contributed in the research over a four months and 2 weeks period.

This study examined non-response bias which "involves the assumption that people who are more interested in the subject of a questionnaire respond more readily and that non-response bias occurs on items in which the subject's answer is related to his interest in the questionnaire" (Armstrong and Overton, 1977, p. 2). The researchers tried to convince the participants that their information would be treated with the uppermost confidentiality. According to Sekaran (2003), this helps to decrease the non-response rate to a minimum. In addition, non-response bias was calculated by measuring the difference by means of the recommended examination by Lambert and Harrington (1990). This study used Mann-Whitney U-test between early and late participants with respect to the means of all research variables, by selecting the first 50 observations as early participants and the last 50 observations as late participants. The findings illustrated that the importance value in the research variable is not less than .5 probability value, which is insignificant. Hence, there was no statistically significant difference between early and late participants. Therefore, non-response bias was not a concern in this research. Of 330 usable responses, females completed 59%, 52% of respondents were aged 19 or less, 30% were between the ages of 20 and 29 years (Churchill, 1999) and 48.8% held an undergraduate degree. 17.6% of participants were employees at the store. Table 2 illustrates the respondents' characteristics in more detail.

<<Please Insert Table 2>>

4.2. Measures

For the survey instrument, the questions were derived from established scales in previous research. The measurement for the constructs of interest was based on established scales proven to be psychometrically sound (Churchill, 1979). All items were scored based on seven-point Likert scales ranking from 1 (strongly disagree) to 7 (strongly agree), to deliver acceptable properties. The underlying distribution of responses tends towards commitment to learn (Calantone et al., 2002) and behavioural intention (Cronin et al., 2000; Hutchinson and Warren, 2003; Daniel and Jonathan, 2013; Urumsah, 2015). Customer participation scales (Ngo and O'Cass, 2013) were adopted according to the context. Customer dynamics (Gorton et al., 2013) was also obtained from existing scales. Additionally, customer experience (Oh et al., 2007; Otto and Ritchie, 1996) was measured. Table 3 illustrates the definitions and items which were employed to conduct this research investigation. Kaiser-Mayer-Olkin's measure of sampling adequacy is .910>.6. It suggests suitability for exploratory factor analysis; moreover, the relationships between the items are statistically significant and provide a parsimonious set of factors. In addition, Bartlett's test of Sphericity illustrates the relationship between the measurement items, which is higher than .3 and is also appropriate for exploratory factor analysis (Tabachnick and Fidell, 2007; Hair et al., 2006).

<<Please Insert Table 3>>

As an initial examination of their performance within the sample, the primary measurement items were subjected to reliability analyses and a series of factor analyses. All the *a priori* scales presented satisfactory reliability of Cronbach's alpha (<.930) (Nunnally, 1978). However, items such as BI1 (social influence) and CP6 (we work with customers to provide supporting systems to help them get more value out of our services) were removed due to multiple loadings on two factors and low reliability. CL1 (retailer's ability as the key competitive advantage) was dropped due to problematic cross-loadings on extra factors. In addition, CXH2 (experience) was removed for low reliability. The remaining items loaded considerably on the projected constructs, with composite reliabilities ranging from .930 to .963 (Table 3).

Discriminant validity was tested via confirmatory factor analysis and examined by AVE (average variance extracted) for each research construct and compared with the square

correlation among the constructs (Fornell and Larcker, 1981). Based on Dillon and Goldstein (1984) and Fornell and Larcker's (1981) recommendation, the variances extracted for the constructs were also compared to the square of each off diagonal value within the Phi-matrix for the constructs. The results show that the average variance extracted (AVE) for each construct ranged from .598 to .865, and the items signify a distinctive underlying concept. Moreover, a good rule of thumb is that an average variance extracted of 0.5 or higher shows adequate convergent validity. Table 4 presents the results. To address multi-collinearity, we followed established procedures to mean centre related variables prior to generating proposed interaction terms to assess the hypotheses.

<<Please Insert Table 4>>

5. Data analysis and findings

As per the suggestion by scholars (Anderson and Gerbing, 1988; Hair et al., 2006), the two-stage approach in SEM (structural equation modelling) was employed to test the importance of all pattern coefficients of the eight hypotheses, using 330 observations in the analysis. The first stage examined the inner-model (measurement model) by employing AMOS 21 and it was tested to recognize the causal relationships between variables (observed items) and unobserved (the latent) constructs. In addition, the construct validity was examined by CFA (confirmatory factor analysis) in this stage by following Hair et al.'s (2006) recommendations. The second stage was tested using regression path, which explained the causal association between the observed constructs (Anderson and Gerbing, 1988).

To evaluate how the model fit can be compared to a research baseline-model, this study used incremental fit indices [CFI, IFI, and TLI] (Hair et al., 2006). To solve the possible problem of an unreliable standard error and Chi square statistic due to ML application, the model-fit indicators were tested (Bentler and Chou, 1987). Therefore, RMSEA and CFI provide adequate distinctive data to assess the model. CFI .923>.90 shows that good fit is an incremental index, which estimates the fit of a model with the null baseline model. As pointed out by Hair et al. (2006), TLI (Tucker-Lewis index), which is recognized as NNFI (non-normed fit index), compares the χ^2 value of the model to that of the independence model and takes degrees of freedom for the model into consideration (Tabachnick and Fidell, 2007).

Based on the recommended criteria by Garver and Mentzer (1999), CFI (comparative fit index), and RMSEA (root mean squared approximation of error) .076<.08 which illustrates acceptable fit (Hair et al., 2006). So, the measurement model of these three factors was nomologically valid (Steenkamp and Van Trijp, 1991). Furthermore, IFI (incremental fit index), and TLI (Tucker-Lewis index) were .923 and .915 correspondingly and are greater than the recommended threshold of .90 and each criteria of fit, therefore, illustrated that the measurement model's fit was adequate (Hair et al., 2006). The findings of CFA provided a satisfactory fit.

As illustrated in Table 4, Cronbach's alpha of all measures was higher than .930, representing adequate internal consistency. Furthermore, the reliability of measures employing composite reliability were examined; they were greater than recommended (.736>.7) and suggested a satisfactory level of reliability (Hair et al., 2006; Bagozzi and Yi, 1988). Convergent validity was examined with the values of standard errors and CFA loadings. All item and construct loadings were noteworthy (t-value/CR>1.96). The homogeneity of the research construct was assessed by convergent validity. The average variance extracted for each construct ranged from .598 to .865 and which illustrates adequate convergent validity (Table 4).

We examined the proposed research conceptual model employing structural equation modelling (Figure 2). The structural model details the causal associations between theoretical constructs. Based on the structural model, the research hypotheses were examined from the standardised estimate and t-value (critical ratio) (Anderson and Gerbing, 1982; Chau, 1997). The structure equation modelling reflects the assumed linear, causal relationships between the constructs which were tested with the data collected from the validated measures. The path coefficients represent standardised regression coefficients. The structure equation modelling reflects the assumed linear, causal relationships between the constructs were tested with the data collected from the validated measures.

Hypothesis 1 suggests that commitment to learn associations are positively related to customer participation. The result supports this hypothesis (γ=.183, t=2.238). In contrast, commitment to learn relationship with behavioural intention was non-significant and the regression path unexpectedly showed a significant negative relationship between these two variables (γ=.131, t=1.591, p=.112). In other words, the regression weight for behavioural intention in predicting commitment to learn is significantly different from 0 at the .001

significance level, therefore, Hypothesis 2 was rejected. Hypotheses 3 and 4 concern the potential impact of behavioural intention on customer participation and customer dynamics. The analysis shows that there are significant positive relationships (γ=.366, t=7.043; γ=.159, t=3.048 respectively). The standardised regression path between customer participation and customer dynamics (H5) was found to be statistically significant (γ=.191, t=3.828). In addition, Hypothesis 6, the relationship between customer dynamics and consumer experience, was found to be significant (γ=.138, t=2.681). The findings regarding causal paths (standardised path coefficients (β), standard error, *p*-value and hypotheses result) and the parameter estimates corresponding to the hypothesised SEM paths and the resulting regression weights are presented in Table 5.

<<Please Insert Table 5>>

6. Discussion

The focus of this study was to help scholars, retail managers and policy makers to gain a better understanding of the concept of customer dynamics and experience by the practice of smart technologies by posing two questions: (i) Do commitment to learn and behavioural intentions such as social influence, perceived value, etc. have an effect on customer participation and dynamics? and (ii) Do customer dynamics have an effect on customer experience in a retail environment influenced by the use of smart technologies?

The results from a survey of a convenience sample of 330 consumers in high-end retail stores in London indicates that customers' participation in adoption of smart technology in a retail setting is driven by customers' willingness and the ability to learn (customers' commitment) (Calantone et al., 2002) (H1: γ=.183, t=2.238, supported).

There are many individuals who know how to use a smart phone, shop online, or send email and their commitment to learn or use a technology is significant in driving customer participation in smart retail environments. On the other hand, according to the authors there is also the concern of a digital divide where some of the older customer base might not be willing or know how to use a smart phone, shop online, or send email. In most cases, it is not because they do not have access to know how, rather they have come to believe that they are too old to learn or are cautious of the risks of using technology (Immonen and Sintonen, 2015). So, the authors believe that the challenge here for the retailer is to encourage such

consumer base in the take up of smart technology and its associated benefits in order to drive customer participation. This can also be linked to an individual's behavioural intentions for their participation in smart retail environments where the degree of consumers' effort and involvement, both mental and physical ability, is highly significant to participate in an activity.

However, the findings demonstrate that there is no relationship between commitment to learn and customers' perceived likelihood or subjective probability that she/he will engage in a given behaviour (behavioural intention) in a retail setting (Teo and Lim, 2001; Cronin et al., 2000) (H2: γ=.131, t=1.591, p=.112, not supported). This finding is contrary to existing studies that highlight the importance of consumer's commitment to learn for organisations (Jeppesen and Molin, 2003; Jeppesen, 2002). However, this might be explained by the fact that almost 96% of the respondents were aged between 18-39 years old. This would suggest that most of these consumers would have been already engaged in using smart technologies (e.g. smart phones, tablets, etc.) and therefore less of an emphasis was placed by these potential customers on their ability and commitment to learn smart technologies.

Researchers find that there are strong relationships between customer behavioural intention on customer participation (Ngo and O'Cass, 2013) and customer dynamics (H3: γ=.366, t=7.043; and H4: γ=.159, t=3.048, supported). The increased use of smart technology coupled with the advancement of second generation web-based technologies such as social media (Sivarajah et al., 2015) have provided plenty of opportunities for consumers to adapt to this way of thinking. Social media applications such as Facebook, Twitter, and Instagram are playing significant roles in expanding consumer participation and also influencing customer dynamics related activities (i.e. comparing and evaluating various products) in a smart retail environment. For instance, interacting with customers on social media may result in growing the number of potential customers and the possibility of turning potential customers into buyers. Furthermore, when shifting current potential consumers into buyers, social media encourages those purchasers to endorse and share their purchase experience with their networks by giving their positive or negative opinions about a purchased product. This is also a result of the social influence of users and peers in the social media network and potential consumer's behavioural intention to participate in these platforms in learning and understanding other user views about existing and new products and services, which is better enabled by these web-based technologies.

The dynamics of customers, which refers to the searching, comparison and evaluation of the flow of activities that takes place between a customer and the retailer (Douglas and Craig, 1997; Lemon et al., 2002) can be driven by the adoption of smart technology in a retail setting (H5: γ=.191, t=3.828, supported). This finding adds to the existing literature (Pantano and Naccarato, 2010) which highlights that introduction of advanced technologies affects the traditional customer decision making process based on: the need for acknowledgment, search for information, pre-purchase assessment, and post-consumption evaluation. In today's world of digital innovation, power is swiftly shifting to the consumer more than ever. For example, the digital medium has brought about transparency of prices and made it convenient for consumers with a mobile device or computer to speedily search a product for the lowest price (Grewal et al., 2009). The typical online purchase now involves the use of either a search for online coupons, a price comparison engine, a free shipping offer, or discounts, a daily deal or some other incentive that decreases the price paid. This has meant that the adoption of smart technologies has led to different consumer dynamics in a smart retail environment and there is a need for retailers to embrace this power shift and drive better customer experience in order to acquire and retain potential customers.

Finally, the results illustrate the significant relationships between customer dynamics and customer experience which refers to the overall experience the customer has with the retailer, based on all interactions and thoughts about the business (Oh et al., 2007; Verhoef et al., 2009) (H6: γ=.138, t=2.681, supported). The customer experience is no longer limited to customers and their close friends. Smart technologies combined with social media have given customers the ability to reach out to their contacts online and share that same message with millions of people around the globe. One mistake by a retailer or one bad customer experience can put a firm's reputation at significant risk. However, there are also plenty of opportunities to harness smart technologies and encourage customer advocates to share their experiences, which can extend their reach. These findings highlight that there is a need for retailers to embrace smart technologies and recognize how they affect the customer experience – both positively and negatively. This will then allow retailers to capitalize on this trend and swoop in on new business.

7. Implications to Research and Practice

This study contributes to the extant research stream on customer dynamics and customer experience with the development of a conceptual model highlighting the determinants such as commitment to learn, customer's behavioural intentions and customer participation's implication on customer dynamics and experience in a retail environment leveraging smart technologies. This research theorizes that customer participation may account for the effect of user behavioural intentions and willingness to learn, which consequently impacts customer dynamics and experience. The empirical findings add to the existing literature by highlighting for instance the strong relationships between customer behavioural intention and customer participation and customer dynamics. Furthermore, an interesting research implication is that this study points out that the use of smart technologies is affecting the traditional customer decision-making process within a retail context. This study has developed a new set of potential research trajectories for exploration in the future.

The authors of this paper have presented the practice community such as retail managers with an insight into the role of customer participation and consumer dynamics in realising the value of customer experience influenced by the use of smart technologies. More specifically, it highlights the dynamics of consumer behaviour within the digital retail settings enriched with smart technologies. As a result, the findings of this study are significant to decision-makers as it emphasises that retail executives need to learn, evolve and embrace the likely effects of smart technologies on customer participation and customer dynamics. The retail managers must also recognise that the innovative technologies will get inexpensive, more versatile and faster and therefore their customer's shopping experience will not just include visiting the store but searching for various retailers, rapid and hassle-free returns, comparing prices, and so on, using their smart mobile devices (Varadarajan et al., 2010).

Practitioners need to understand that shoppers' awareness depends not solely on business-generated marketing efforts but also on online expert recommendations or reviews from their peers on social media sites such as Facebook and Instagram (Clemons, 2009). Furthermore, retail executives can also leverage smart technologies to send coupon codes and offers to customers' mobile devices (Oh et al., 2012). The retailers can optimize search terms and location-based promotions (Reinartz, 2016; Rigby, 2011). They can provide personalised and targeted offers to shoppers who check in to stores through external platforms like

Foursquare. The list of possibilities is ever growing and therefore practitioners need to be flexible and embrace these changes in the retail environment that is influenced by various emerging technologies.

8. Conclusions, Limitations and Future Directions

This study synthesises literature from smart technology, customer behaviour, retail marketing and retail management and empirically verifies current understanding of the applicability of customer dynamics in gaining knowledge of customer behaviour. This has been achieved by examining the contribution of behavioural intentions, commitment to learn and customer participation to drive customer experience. Further studies should seek to comprehend the management and marketing strategies, which can enhance the customer experience through descriptive research by linking consumer dynamics and customer experience with retail strategies, and retail performance metrics, which may help companies to attract more customers. Building a favourable customer experience has drawn the attention of marketing, management authors and retailers, but there is limited academic research on this area (Dennis et al., 2014; Verhoef et al., 2009).

This research has illustrated a holistic representation of the customer dynamic and experience construct and developed and validated a conceptual research model outlining its determinants. This should result in insights that could make an important contribution to extant knowledge and will help to validate and improve the findings in the related literature. Therefore, the findings of the present study promise benefits in the retail context in the UK. Moreover, these findings call for great caution when invoking our framework and application in a retail context for consumers of different age groups located in different locations or another country. Our caution is based on the arguments presented by marketing scholars such as Gupta and Gupta (2013) whose studies have explained close links between kind of store, country of origin and consumer behaviour. We also anticipate culture to be an important element to be considered for future research on this topic. Furthermore, the sample of our study consists of young people. Adoption of smart technology by senior citizens or pregnant women for medical purposes or by young women for safety purposes has not been considered by our research. Therefore, customer segments of different needs and in various age groups can be considered to be a limitation of our study, which should also be considered by future studies. Other factors influencing the setting of our kind of research could be the effect of

brand on consumer behaviour or linkages such as brand personality and customer personality (Gupta, 2015). Our model should be reinterpreted by scholars pursuing further research in this area to propose a mechanism with which commitment of consumer to learn can influence their participation, and experience through a review of customer dynamics (searching, comparing, and evaluating).

Future research on this topic should consider justifying reversing the sequence of relationships between customer commitment, participation and experience. An empirical evidence in this area of study will help researchers to rationalise the causal relationships between variables that have been the focus of this study. Predominantly, this study argues that customer participation may account for the effect of user behavioural intentions and willingness to learn, which in turn impacts customer dynamics and experience that offer a rich agenda for future research. This research calls on policy makers and managers to consider the role of customer participation and consumer dynamics in realising the value of customer experience. More specifically, it provides practitioners with a better understanding of consumers' behaviour within the new retail settings enriched with smart technologies. Thus, the findings of this study are significant for decision-makers. This study also seeks to provide an insight into changes in consumer dynamics, concerning for instance searching, comparing, evaluating, and purchasing behaviour within the new technologies-mediated environment.

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Table 1: Examples of Customer Solutions in a Smart Retail Context

Customer Solutions	Smart Retail Application Example	Reference
Mobile Payments/Point of Sale (POS)	Use of Near Field Communication (NFC) readers, tap and go systems or virtual wallets by retailers that support these forms of payment will likely increase at a fast rate.	Barthel et al. (2015)
Virtual Reality Experience	Retailers are experimenting with smart mirrors in dressing rooms. Depending on the technology used, these can allow "virtual trying-on" of clothes, propose accessories to match an outfit, enable shoppers to upload photos of them wearing their new outfit to social media, and support electronic ordering straight from the dressing room,	Pantano and Naccarato (2010)
Personalised Promotional Offers	Beacon technology offers stores to identify individual shoppers who have installed the store's app on their smartphone. They can then propose personalised offers and discounts to that shopper as they browse – based on the data they already have about that customer's preferences and previous purchases.	Skinner (2014)
Browse and Order	Retailers are setting up 'browse and order' points to enable shoppers to browse catalogues, order or reserve items, and have them delivered to a location of their choice. As a result allowing for customers to avoid queuing in-store.	Davis (2014)
Product Trial and Display	Use of bright lighting for fitting rooms, changing lighting based on the garment that a customer is trying on or when shop browsing through their catalogue the physical product you are interested in will be illuminated.	European Institute of Innovation and Technology (2014); Horska and Bercik (2014)

Table 2: Respondents' characteristics

Gender			**Occupation**		
Female	196	59.4	Top executive or manager	21	6.4
Male	134	40.6	Owner of a company	11	3.3
Education			Employee at the store	58	17.6
High school/Some colleges	96	29.1	Lawyer, dentist or architect etc.	43	13.0
Undergraduate	161	48.8	Office/clerical staffs	39	11.8
Postgraduate and above	73	22.1	Civil servant	13	3.9
Age			Craftsman	27	8.2
19 years old or less	172	52.1	Student	52	15.8
20 to 29 years	99	30.0	Housewife	49	14.8
30 to 39 years	48	14.5	Retired	17	5.2
40 to 49 years	2	.6			
50 to 59 years	3	.9			
60 years old or more	6	1.8			

Table 3: The main constructs, definitions, and measurements items

Main Constructs		
Commitment to learn		
Operational Definition: Customer's willingness and the ability to learn (Calantone et al., 2002)		
CL1	Customer's ability as the key competitive advantage	Calantone et al., 2002; Jeppesen and Molin, 2003
CL2	The basic values as the key to improvement	
CL3	Customer learning as an investment	
CL4	Learning as the key commodity necessary to survive	
Behavioural intention		
Operational Definition: An individual's perceived likelihood or subjective probability that he or she will engage in a given behaviour (Ajzen, 2002; Cronin et al., 2000; Teo et al., 2001; Venkatesh et al., 2003; 2008)		
BI1	Social influence	Cronin et al., 2000; Hutchinson and Warren, 2003; Daniel and Jonathan, 2013; Urumsah, 2015
BI2	Perceived value	
BI3	Effort expectancy	
BI4	Perceived credibility	
BI5	Facilitating conditions	
BI6	Perceived overall quality	
Customer dynamics		
Operational Definition: This is the flow of activities (i.e. search, compare, evaluate) that takes place between a customer and the retailer (Douglas and Craig, 1997; Lemon et al., 2002)		
CD1	Awareness	Ferrell and Hartline, 2011; Kotler and Armstrong, 2010; Kotler and Keller, 2006
CD2	Interest	
CD3	Desire	
CD4	Action	
Customer experience		
Operational Definition: This refers to the overall experiences the customer has with the retailer, based on all interactions and thoughts about the business (Oh et al., 2007; Verhoef et al., 2009)		
Hedonic		Otto and Ritchie, 1996
CXH1	Memorable	
CXH2	Experience	
CXH3	Entertaining	
CXH4	Exciting	
CX1	Sense of comfort	Otto and Ritchie, 1996
CX2	Educational	Oh et al., 2007
CX3	Novelty	Otto and Ritchie, 1996
Recognition		Otto and Ritchie, 1996
CXR1	Felt important	
CXR2	Felt respected	
CXR3	Felt welcomed	
CX4	Safety	Oh et al., 2007
CX5	Sense of beauty	
CX6	Relational	
Customer participation		
Operational Definition: The degree of consumers' effort and involvement, both mental and physical, necessary to participate in an activity (Ngo and O' Cass, 2013)		
CP1	We work with customers to serve them better	Ngo and O'Cass, 2013
CP2	We work with our customers to co-produce offerings that mobilize customers	
CP3	We interact with customers to co-design offerings that meet customers' unique, changing needs	
CP4	We provide supporting services in cooperation with customers	
CP5	We co-opt customer involvement into our services	
CP6	We work with customers to provide supporting systems to help them get	

more value out of our services

Table 4: Descriptive statistics, reliabilities and Factor loadings

Constructs	Cronbach's alpha	Items	EFA Final loading	Correlated item- total correlation	Mean	SD	AVE	Construct Reliability
Commitment to learn (CL)	**.930**						**.865**	**.736**
Items deleted (CL1) Cross-loaded		CL2	.923	.169	5.7455	1.38448		
		CL3	.945	.165	5.6394	1.51997		
		CL4	.922	.167	5.5788	1.41470		
Behavioural intention	**.959**						**.751**	**.812**
Items deleted (BI1) Cross-loaded and low reliability		BI2	.846	.635	5.5939	1.44356		
		BI3	.875	.600	5.6697	1.41528		
		BI4	.836	.591	5.3455	1.48817		
		BI5	.883	.640	5.6333	1.42132		
		BI6	.893	.597	5.6061	1.38905		
Customer expectation	**.934**						**.732**	**.810**
		CE1	.852	.493	5.5273	1.28382		
		CE2	.875	.498	5.5758	1.28187		
		CE3	.865	.434	5.4333	1.44086		
		CE4	.890	.473	5.4121	1.41201		
		CE5	.793	.522	5.8091	1.21662		
Customer dynamics	**.951**						**.623**	**.895**
		CD1	.904	.371	5.6424	1.23747		
		CD2	.914	.404	5.7000	1.24907		
		CD3	.892	.403	5.7273	1.19453		
		CD4	.928	.386	5.6879	1.23383		
Customer experience	**.948**						**.598**	**.902**
Items deleted (CXH2) low reliability		CXH1	.763	.689	5.2697	1.35606		
		CXH3	.798	.704	5.2364	1.40728		
		CXH4	.805	.641	5.1273	1.41492		
		CX1	.844	.680	5.3545	1.33633		
		CX2	.819	.585	5.3182	1.34322		
		CX3	.420	.403	5.3182	1.12121		
		CXR1	.767	.633	5.5848	1.26217		
		CXR2	.753	.599	5.6364	1.22333		
		CXR3	.839	.667	5.2818	1.41506		
		CX4	.745	.612	5.1727	1.32907		
		CX5	.862	.684	5.3879	1.34634		
		CX6	.773	.631	5.3727	1.28014		
Customer participation	**.963**						**.791**	**.816**
Items deleted (CP6) Cross-loaded and low reliability		**CP1**	.895	.564	5.5970	1.42214		
		CP2	.873	.584	5.5818	1.37751		
		CP3	.877	.581	5.5273	1.35523		
		CP4	.905	.593	5.5879	1.40770		
		CP5	.896	.590	5.6273	1.31296		

Table 5: Results of hypothesis testing

				Estimate	S.E	C.R	*p*	Hypothesis
H1	**Commitment to Learn**	--->	**Customer Participation**	.183	.082	2.238	.025	Accepted
H2	**Commitment to Learn**	--->	**Behavioural Intention**	.131	.083	1.591	.112	Rejected
H3	**Behavioural Intention**	--->	**Customer Participation**	.366	.052	7.043	***	Accepted
H4	**Behavioural Intention**	--->	**Customer Dynamics**	.159	.052	3.048	.002	Accepted
H5	**Customer Participation**	**--->**	**Customer Dynamics**	.191	.050	3.828	***	Accepted
H6	**Customer Dynamics**	--->	**Customer Experience**	.138	.052	2.681	.007	Accepted

***p<.001, **p<.01, *p<.05

Notes: Path = Relationship between independent variable on dependent variable; β = Standardised regression coefficient; S.E. = Standard error; *p* = Level of significance.

Figure 1: Research Model

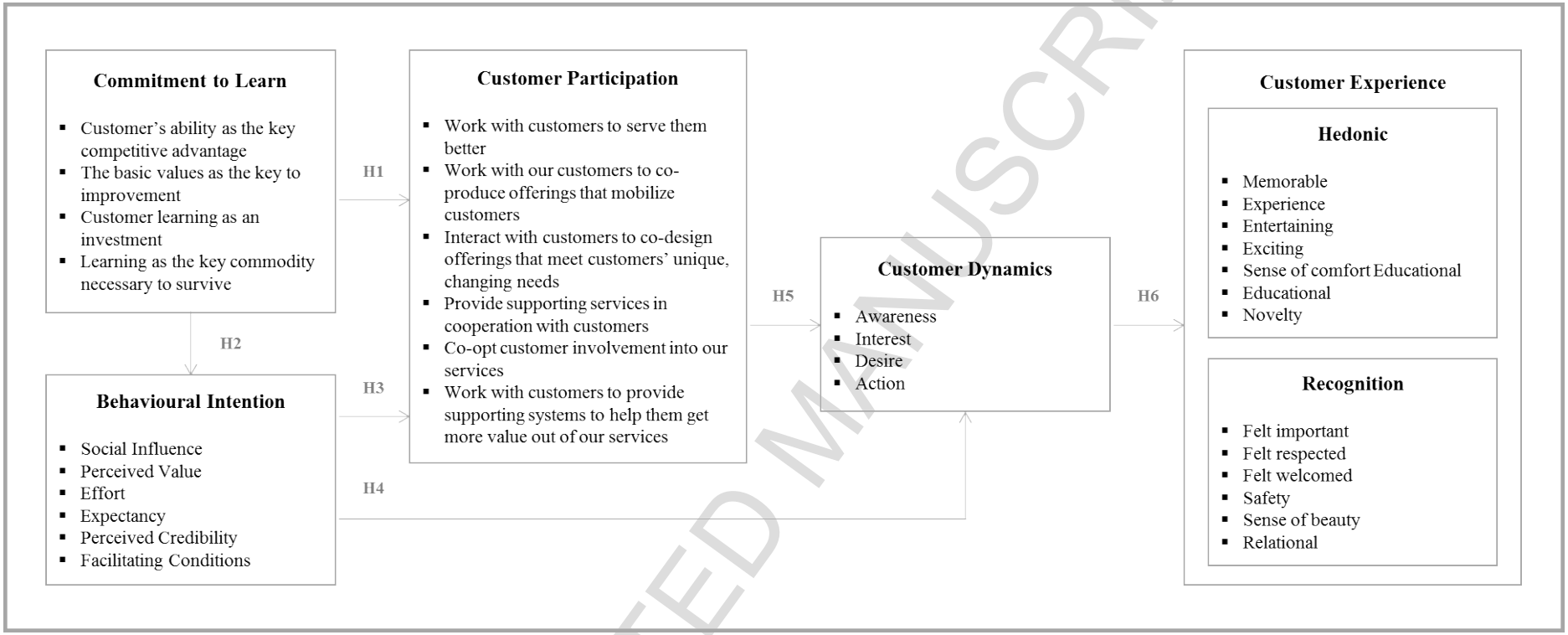

Figure 2: Validated structural model