Shopping intention at AI-powered Automated Retail Stores (AIPARS)

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Abstract

Artificial Intelligence (AI) is transforming the way retail stores operate. AI-Powered Automated Retail Stores are the next revolution in physical retail. Consumers are facing fully automated technology in these retail stores. Therefore, it is necessary to scrutinize the antecedents of consumers' intention to shop at AI-Powered Automated Retail Stores. This study delves into this area to find the predictors of consumers' intention to shop at AI-Powered Automated Retail Stores. It extends the technology readiness and acceptance model by the addition of AI context-specific constructs such as Perceived Enjoyment, Customization and Interactivity from the present literature. The proposed model is tested by surveying 1250 consumers & the data is analyzed using the PLS-SEM technique and empirically validated. The outcome of the study reveals that Innovativeness and Optimism of consumers affect the perceived ease and perceived usefulness. Insecurity negatively affects the perceived usefulness of AI-powered automated retail stores. Perceived ease of use, perceived usefulness, perceived enjoyment, customization and interactivity are significant predictors of shopping intention of consumers in AI-powered automated stores. This research presents insightful academic and managerial implications in the domain of retailing and technology in retail.

Keywords: TRAM, PLS-SEM, perceived enjoyment, customization, interactivity, Artificial Intelligence-powered Automated Retail Stores.

Introduction

Artificial intelligence (AI) is a disruptive innovation, which has provided momentum for digital transformation in the industry with rapid advancements over the last decade (Duan et al., 2019; Dwivedi et al., 2019a). As per Nilsson, (2009, p.13), "artificial intelligence is that activity devoted to making machines intelligent and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment". Although AI has been around since the 1950s, it has gained popularity lately (Duan et al., 2019), as it is creating value for the business by helping the retailers to anticipate future demand, promotion and delivery of goods and services to the customers (Bughin et al., 2017). In retail, AI can help in anticipating customer demand, automation of store operations, customer engagement, customer personalization and price optimization. AI has already improved 50% efficiency in the assortment, 20% stock reduction and a 30% increase in online sales of retailers who are using AI tools (Bughin et al., 2017). As per the IBM Report, (2017), on smart shopping, 91% of the retail executives confirm that AI in retailing will play a disruptive role and 45% of customers want AI-based online shopping options and recommendations in physical retailing. Applications of AI-based technologies and automation in retailing are for branding and new customer recruitment, forecasting demand, personalization and loyalty, supply chain planning, improving merchandising, marking and advertising, boosting efficiency in service and customer engagement (IBM, 2019). As per the Juniper research, global retailer expenditure on AI will be reaching 7.3 billion US$ by the year 2022 (InsideRetail Asia, 2019). It is expected that by 2024, the diffusion of AI technology in the retail sector will be 8 billion US$ (Bhutani and Wadhwani, 2019). 80% of the consumer product and retail company executives surveyed across 170 countries mention that by 2021, companies will be using AI powered automation. Also, 40% of them revealed that companies are already using some or the other kind of automation in retailing (IBM, 2019).

AI-based technologies and techniques such as Robots, Chatbots, bots, augmented reality, virtual reality, machine learning, deep learning, computer vision, cognitive conversation commerce along with the internet of things are changing the physical as well as the online retailing space. AI-Powered Automated Retail Stores (AIPARS) can be defined as the stores which integrate AI and Robotics along with advanced software systems to create fully automated self-service retail

stores which provide one-click check-out for customers, automated explaining, marketing, selling, payments, customization of product alerts and information, product delivery and customer education (Tom and Karun, 2018; Huilgol, 2017; Chris, 2018). AIPARS depicts the 'smart' technology advancements, socio-economic developments along with changing customer shopping behaviour in retail, powered by the swift progress in connected technologies, communication and information (Demirkan and Spohrer, 2014).

'Amazon Go' which is a chain of fully automated stores by Amazon is expanding with 3000 stores in the USA by 2021 (Begley et al., 2019). In China, Suning- a retailer chain of electronics has established AIPARS and Auchan retail is coming up with several fully automated small convenience stores (Deloitte, 2018). Retailers such as Aditya Birla Retail, Reliance Retail and Shopper's Stop are using the application of AI-based technologies to develop a seamless interface and experience for the consumers in India (Bhatia, 2018). The physical retail stores are facing tough competition with e-commerce companies (Chiu et al., 2011). Amazon is expected to start automated stores in India (Huilgol, 2017) and there are companies like Walmart also aspiring to enter the Indian market. The first AIPARS- 'Watasale' grocery store has started in Kerala, India in September 2018 with plans to expand in other cities of India (Tom and Karun, 2018) AIPARS is poised to be the next revolution in physical retail in India. It is imperative to study and comprehend the consumers' perspective of shopping at AIPARS. These stores are yet to become a reality in India. AIPARS are high-end technology-based stores and the success of such an emerging concept ultimately depends on the customers' adoption intention. AIPARS are designed to save manpower cost and increase the revenue of the store. Innovative technologies in retail stores influence the behaviour of consumer in retail sector (Garaus et al., 2016; Roy et al., 2017; Pantano and Vannucci, 2019; Bulmer et al., 2018). Consumers are facing innovative technologies in retail stores and it is necessary to study their perception towards technology as it affects the purchase intention of consumers (Inman and Nikolova, 2017; Adapa et al., 2020). Therefore, it is essential to study the behavioural consumer's intention to shop at such stores. It will be helpful for the managers of retail stores to understand consumer behaviour regarding shopping at AIPARS and they can develop suitable strategies for the smooth adoption of shopping by customers at AIPARS.

To understand the predictors of the behavioural intention of customers to adopt new technology, such as perceived ease of use and perceived usefulness, prior studies have deployed various models of technology adoption (Chen et al., 2018; Davis, 1989; Dwivedi et al. 2019b; 2017; 2016; Rana et al., 2016; Evanschitzky et al., 2015; Müller-Seitz et al., 2009; Mukerjee et al., 2019; Venkatesh et al., 2003; 2012). However, the main focus of those studies based on the technology acceptance models was the empirical investigation on the adoption of self-service technology, functional technologies and technology-enabled services (Mukerjee et al., 2019; Lin and Chang, 2011; Lundberg, 2017; Evanschitzky et al., 2015) in the context of shopping. However, less emphasis was laid on the AI technology-specific characteristics, which motivate the shopping behaviour. Hence, the authors try to fill this theoretical gap by scrutinizing the effect of AI technology-specific features on the shopping behaviour of the customers. AIPARS is a budding concept in an emerging economy like India and it is vital to study the consumer's behavioural intention to shop in these retail stores. In this study, the authors take the initial step in this direction by empirically investigating this issue.

RQ: What are the determinants that influence the consumer's behavioural intention to shop at AIPARS?

The research question is answered by building a conceptual framework using the Technology readiness and Acceptance Model (TRAM) (Lin et al., 2007) along with AI context-specific constructs, which is empirically verified using 1250 customer's survey data. This is the first study that integrates the TRAM model with AIPARS context-specific variables to explain the customers' shopping intention in AIPARS more comprehensively.

This study is further organized with the section of the literature review that includes literature to develop the theoretical framework trailed by the section of hypotheses development. Further, it includes the Research methodology section, which discusses the sampling, collection of data and design of research instrument. It further continues with the data analysis and results section. The last part deals with the discussion, managerial and theoretical implications, limitations & future research directions and Conclusion.

Literature Review

There exist studies on the adoption of AI in different contexts. There exist studies discussing the adoption AI-based technologies - AI and Robots in tourism (Ivanov et al., 2017; Tussyadiah and Park, 2012; Tussyadiah and Miller, 2019), intelligent personal assistant (Han and Yang, 2018), self-driving vehicles (Shariff et al., 2017), Smart home services (Yang et al., 2017) and smart home healthcare systems (Alaiad and Zhou, 2016). There exist studies discussing the adoption of some AI technologies like augmented reality and virtual reality in retail malls for shopping (Han et al., 2018; Mann et al., 2015) However, there is no study which examines the shopping intention at AIPARS.

The IT adoption model employed integrates Technology adoption model (TAM) with technology readiness (TR) to form a combined model called TRAM to offer a better understanding of the customers' shopping intentions at AIPARS. The TRAM model was deployed in various studies of customer adoption of new technologies (Mukerjee et al., 2019; Chen et al., 2009; Martens et al., 2017; Kim and Chiu, 2019; Lin and Chang, 2011; Chen and Lin, 2018). The subsequent sections provide a detailed discussion about TR, TAM and TRAM.

Advanced technology in retail stores is proposed as an important tool to reduce customer churn as it offers an exciting experience to the consumers in the store (Kim et al., 2017). The extant studies available on online shopping are (Ashraf et al., 2015; Gefen et al., 2003; Akroush and Al-Debei, 2015; Hong et.al., 2002; Wu and Ke, 2015; Kim, 2012), Smartphone shopping and mobile shopping (Lee et al., 2017; Chen et al., 2018; Lee, 2018; Chen and Lan, 2014; San-Martín et al., 2015) and shopping in retail malls using new technology- augmented reality, RFID and virtual reality (Papagiannidis et al., 2014; Han et al., 2018; Huang and Liao, 2015; Liao and Huang, 2014; Mann et al., 2015). However, there is currently no study examining the shopping behaviour of customers in AIPARS.

AIPARS are the next revolution in physical retailing. In 2016, 'Amazon Go' launched by the physical retail giant is a classical use-case of AIPARS, which is manifested by a one-click checkout. Table I shows the AI-based technologies used in AIPARS.

Table I. Technologies in AIPARS

Sr. No.	Category of Assistance in AI-based retail	Technology
1	Personal Product	1. Robot Shopping Cart (Chris, 2018)

	Assistants	2. Kroger (Beklemysheva, 2018)
2	Product-Price Comparison	1. Compare Me Mobile application (Kim, 2018) 2. Grocery Smarts Coupon Shoppers Mobile application (Kim, 2018)
3	Context-aware Data Pools	1. Amazon Go mobile app (Beklemysheva, 2018) 2. Shopkick app (Elizabeth, 2018)
4	Retail in-store Furniture	1. Interactive Dressing Room (Dhamdhere, 2016) 2. In-Store Neuroscience Stylist (Dhamdhere, 2016)
5	Product Finding	1. @WalmartLabs (Beklemysheva, 2018) 2. Shopkick (Elizabeth, 2018)
6	Product Augmentation	1. Lacoste AR mobile app (Alexandra, 2018) 2. 3D beauty mirror (Alexandra, 2018)
7	Retail Environment	1. Amazon Dash (Silbert, 2018) 2. Futuristic Smart Mirror (Alexandra, 2018)
8	Payments	1. Apple Pay mobile application (Chantal, 2018) 2. Stop & Shop Supermarket's Scan It Application (Saarijärvi et al., 2014)

Theoretical Basis

Readiness for technology and the adoption of technology is a vital topic of research in today's technology-driven business environment. TAM (Davis, 1989) is a frequently utilized model to understand the adoption of technology. TR signifies a consumer's inclination to utilize technology (Parasuraman, 2000).

TR (Technology Readiness)

TR is discussed as an individual's predisposition to accept and utilize new technologies for attaining the goals at work and in personal life. TR can be considered as "an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person's predisposition to use new technologies" (Parasuraman, 2000, p.308). TR index consists of four aspects - I) optimism (OMM) and innovativeness (INN) are factors 'for' technology and II) discomfort (DIF) and insecurity (INS) are factors 'against' technology. These factors are defined (Parasuraman, 2000, p.311) as- 1) OMM- "A positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives" 2) INN- "A tendency to be a technology pioneer and thought leader" 3) DIF- "A perceived lack of control over technology and a feeling of being overwhelmed by it" 4) INS- "Distrust of technology, stemming from skepticism about its ability to work properly, and concerns about its potentially harmful

consequences". Every individual has a different attitude toward technology; it can be positive or negative for a technology, which co-exists (Parasuraman, 2000).

TR Index (TRI) 2.0 scale can be utilized with different variables in different countries for conducting research (Parasuraman and Colby, 2015). The TRI scale was again validated (Rojas-méndez et al., 2015) in cross-cultural environments.

TAM (Technology Adoption Model)

In technology adoption research, TAM is a broadly utilized and recognized model and it examines the consumer's use intention of technology. The belief of a user regarding perceived ease of use (PEE) and Perceived usefulness (PFL) of a new technology influences the user intention (Davis, 1989). PEE means "the degree to which a person believes that using a particular system would be free of effort" and PFL means "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). Intention means the subjective chance of a person's engagement in a particular behaviour (Fishbein and Ajzen, 1975). TAM model has been extensively employed to study adoption of M-shopping (Agrebi and Jallais, 2015; Chen et al., 2018), Internet-enabled Television Shopping (Wagner et al., 2017), E-Auctions (Li et al., 2017), online shopping (Kim, 2012; Ho and Chen, 2014; Chen and Teng, 2013) and technology at a retail store (Müller-Seitz et al., 2009; Evanschitzky et al., 2015).

TRAM (Technology Readiness and Acceptance Model)

TRAM is an amalgamation of TR (Parasuraman, 2000) and TAM (Davis, 1989). TR means the cognitive inclination of customers' to accept new technologies and discusses the individual-specific factors affecting new technology adoption. TR is considered on the consumers' overall belief (Parasuraman, 2000) and shows their usage of technology. However, consumers with high TR do not always be in favour of the adoption of new technology; whereas, TAM is system-specific and discusses PEE and PFL (Davis, 1989). TRAM has more explanatory power for the new technology acceptance as it considers the TR model and TAM model that provide

consumers' cognitive willingness and perspective of the new technology- PEE and PFL. TR consists of four factors, out of which- OMM and INN are drivers of TR. DIF and INS are inhibitors of TR. TAM model discusses the PEE and PFL to understand the shopping intention (SHN). PEE means an individual's feeling that a specific system can be easily used without many efforts. PFL means an individual's conviction that particular system usage can aid in improving the performance of a job (Davis, 1989). SHN means the subjective likelihood of a person's engagement in certain shopping behaviour (Fishbein and Ajzen, 1975). It was found that in marketing settings, TRAM improves the applicability of both the models (Lin et al., 2007).

TRAM model has been applied to examine the new technology adoption- e-service system (Lin et al., 2007), AR role in Tourism (Chung et al., 2015), Open Banking (Sivathanu, 2019), Mobile Services (Chen et al., 2013), Mobile Payment (Martens et al., 2017; Shin and Lee, 2014), HIV e-health services (Marhefka, 2018), Social media (Jin, 2013), Digital services in B2B health care sector (Hallikainen and Laukkanen, 2016), Mobile electronic medical record system (Kuo, Kiu and Chen-Chuang, 2013), Dietary and fitness apps (Chen and Lin, 2018), Data standards in smart cities (Buyle et al., 2018), Sports wearable (Kim and Chiu, 2019), Smart Retail technology adoption (Roy et al., 2017), mobile device shopping (Kumar and Mukherjee, 2013), Self-Checkout Services of retail grocery stores (Mukerjee et al., 2019) and self-service technology (Chen et al., 2009; Lundberg, 2017). To study the shopping intention at AIPARS, this study considers the TRAM model as AIPARS is a new retail technology innovation, which will surely help to investigate the shopping behaviour of the consumers.

Context-Specific Variables

This study empirically investigates the adoption of AIPARS among the customers. The existing studies on AI technology adoption mainly discuss the antecedents such as social capability & capability of device (Song, 2017), hedonic motivation (Niemelä et al., 2017), trust (Hengstler, Enkel and Duelli, 2016). Gursoy, et al., (2019) found that performance expectancy, hedonic motivation and emotions play a vital role in the adoption of AI devices used in service delivery. The study by (Pantano, Rese and Baier, 2017) mention the variables of adoption of virtual reality of online websites and discuss the variables- response time, interactivity, quality of information

and aesthetic quality. There is a dearth of AI technology-specific variables in the extant studies (Pantano et al., 2017; Alaiad and Zhou, 2016). Hence, the authors considered the AI technology-specific variables that influence the customer's shopping behaviour.

After extensive literature survey and discussion with subject matter experts, this study considers three variables- *Perceived Enjoyment* (PEJ) (Lee and Chung, 2008; Pantano and Servidio, 2012; Kahn et al.,2018; Kshetri, 2018; El Shamy and Hassanein, 2017; Brill, 2018; Liu et al., 2018), *Customization* (CST) (Magrath and McCormick, 2013; Lee and Benbasat, 2004; Pantano and Servidio, 2012; Pierdicca et al., 2015; Kahn et al.,2018; Chopra, 2019) and *Interactivity* (INY) (Tsikriktsis, 2004; Yang and Wu, 2009; Kang et al., 2018; Berman, 2019; Pantano et al., 2017; Cowan and Ketron, 2018; Speicher, Cucerca and Krüger, 2017) which are considered from existing studies on shopping in technology-driven physical retail stores and online. To provide better explanatory power, the TRAM model needs to consider more parameters, which are related to the new AI-based retail technology. Hence, in the context of AIPARS, all these context-specific variables are considered in this study and integrated into the model.

Perceived Enjoyment (PEJ)

PEJ indicate the degree to which performing the task using technology is contemplated to be pleasurable apart from consequences of the activity (Venkatesh et al., 2003; Davis et al., 1992) Regarding augmented reality shopping apps, PEJ means the entertaining transient experience and playfulness provided by these AR apps (Olsson et al., 2013). The existing studies discuss that perceived enjoyment value is strong in virtual stores than traditional stores (Lee and Chung, 2008). Customers enjoy a shopping and playful experience in stores due to the applications of self-checkout machines (Jackson et al., 2014) and virtual reality shopping environment (Speicher et al., 2017). The individuals tend to get involved in using technology when he/she feels pleasure while using technology for shopping (Van der Heijden, 2004; Bruner and Kumar, 2005; Yeo et al., 2017). AI-related technology provides enjoyment to the customers while shopping (Kahlert et al., 2016; Kahn et al., 2018; Liu et al., 2018; El Shamy and Hassanein, 2017; Brill, 2018). AIPARS are hassle-free and a unique concept where AI technology will guide and assist shopping which creates an enjoyable experience (Bauer et al., 2018; Pantano et al., 2017).

Customization (CST)

CST is discussed as the capability of the retailer to provide the transactional environment, product and services which are suitable for individual customers (Srinivasan et al., 2002). CST regarding e-commerce is also discussed as the website capability to change itself as per the customer's need or can be changed by the customer as per his/her requirement (Lee and Benbasat, 2004). Nowadays, when it comes to retail shopping, many customers do not like standardized products and prefer product customization (Piller and Müller, 2004). AIPARS provides customized personal shopping recommendations and customer service through chatbots, digital screens in stores and mobile alerts in store (Kimberly, 2016). CST is an important benefit provided by e-commerce and m-commerce (Morosan, 2014; Chong et al., 2012) and shopping at retail stores using AI technology (Pierdicca et al., 2015; Kahn et al., 2018; Chopra, 2019). AIPARS technologies help customers to get customized recommendations, which help them in shopping.

Interactivity (INY)

INY is defined - "the extent to which users can participate in modifying the form and content of a mediated environment in real-time"(Steuer, 1992; Ballantine, 2005, p. 463). INY is the customers' belief to the level to which they can interact with the seller and how they feel engaged due to the interaction (Thamizhvanan and Xavier, 2013; Srinivasan et al., 2002). "A seamless sequence of responses to any technology" is considered as INY which facilitates responses sequentially and smoothly (Hoffman and Novak, 1996). AIPARS technologies facilitate an interactive environment by guiding the customers regarding the product location, usages, discounts, price and products available in the store through mobile apps and alerts (Kimberly, 2016).

The interactivity of AI technology is discussed in various studies of AI (Bai, Tadjouddine, Payne and Li, 2017; Pantano and Pizzi, 2020). The existing AI studies discussed the interactivity of online virtual reality (Pantano et al., 2017; Yang and Wu, 2009) and similar technology is also used in AIPARS. Interactivity is one of the important strategies to attract customers by the retailers which can be achieved through AI technology (Berman, 2019). Interactivity is predictors of AI-based shopping-related technology (Pantano et al., 2017; Yang and Wu, 2009;

Etemad-Sajadi, 2016). The AIPARS environment is interactive, which will surely impact consumer shopping behaviour.

Theoretical Framework

The TRAM model integrates the TAM and TR model to scrutinize the adoption intention of new technology (Lin et al., 2007). When people assess their decision to accept any new technology, before thinking about PEE and PFL they recollect the cognitive information about their technology readiness (Lin et al., 2007). TRAM model has explanatory power of technology adoption as it considers individual cognitive readiness and technology-specific factors to understand new technology adoption. TRAM was previously employed to study the adoption of new technology (Chung et al., 2015; Lin et al., 2007; Basgöze, 2015; Kumar and Mukherjee, 2013; Chen et al., 2013). However, the present studies on AI adoption largely consider technology-related variables and do not consider the readiness of the consumer (Pantano et al., 2017; Alaiad and Zhou, 2016; Yang, Lee and Lee, 2018; Gursoy et al., 2019; Etemad-Sajadi, 2016; Brill, 2018). Hence, the TRAM is considered to understand consumer readiness towards AIPARS. The TRAM model needs to consider more parameters, which are related to AI technology-specific factors in the context of AIPARS. There is insufficient literature on AI-specific variables for the adoption of AIPARS (Alaiad and Zhou, 2016; Pantano et al., 2017). Hence, this is the first research to consider the TRAM model and integrate it with three AIPARS context-specific variables to provide better explanatory power. AIPARS provide e-services as well as physical services and there are three context-specific variables from AI shopping technology adoption literature– PEJ (Lee and Chung, 2008; Pantano and Servidio, 2012; Kahn et al., 2018; Kshetri, 2018; El Shamy and Hassanein, 2017; Speicher et al., 2017), CST (Magrath and McCormick, 2013; Lee and Benbasat, 2004; Pantano and Servidio, 2012; Pierdicca et al., 2015; Kahn, et al., 2018; Chopra, 2019) and INY (Tsikriktsis, 2004; Yang and Wu, 2009; Kang et al., 2018; Berman, 2019; Pantano et al., 2017; Cowan and Ketron, 2018; Speicher et al., 2017).

Hypotheses Development

The conceptual model is developed by combining the TRAM model and three context-specific variables to examine the customer intention to shop at AIPARS in India. As per the TRAM model, this study observes the influence of OMM, INN, DIF and INS on PEE and PEF (Lin et al., 2007) and later investigates the influence of PEE on PFL. This study examines the influence of PEE, PFL, PEJ, CST and INY on the intention to shop (Davis, 1989; Liébana-Cabanillas et al., 2017; Park, 2012; Lin et al., 2007) at AIPARS. The outlined theoretical model is displayed in Figure I.

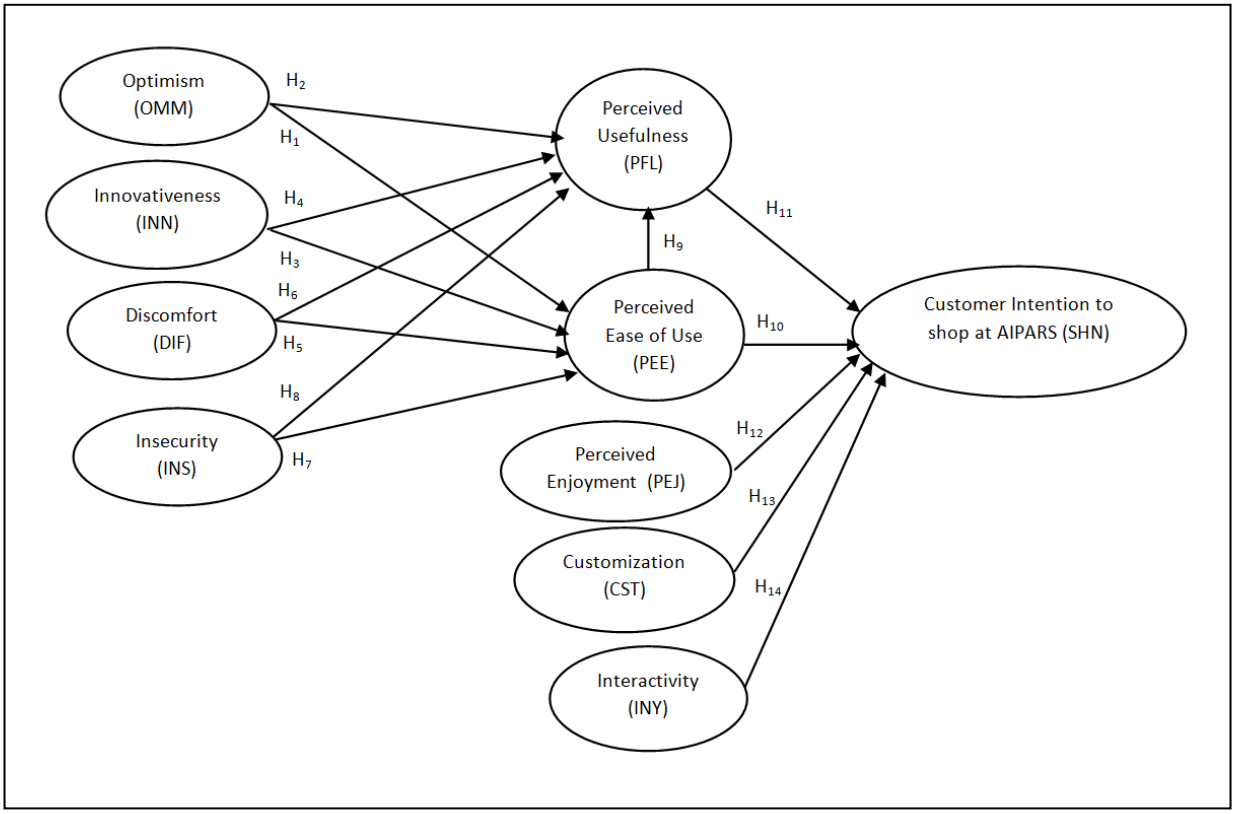

Figure I. Conceptual Model of Customer Intention to shop at AIPARS

Source: Adapted from (Lin et al., 2007)

Hypotheses Development

OMM is concerned with the positive viewpoint of individuals towards technology that it provides them more efficiency, flexibility and control. OMM is a person's preference to seek a new technology available in the market (Lee and Allaway, 2002; Liljander et al., 2006). Generally, customers who have optimism towards technology have a positive mind-set for using new technology and more free to accept technology (Tsikriktsis, 2004; Kuo et al., 2013; Parasuraman, 2000). Hence, OMM influences PEE (Ali et al., 2015; Kim and Chiu, 2019; Erdoğmu and Esen, 2011; Jin, 2013; Chen and Lin, 2018; Lundberg, 2017). It is found that OMM does not influence PEE of mobile payments in South Africa and Germany (Martens et al., 2017). The study of 123 employees in Norway regarding the use of an electronic health record system found that OMM influence the PEE (Godoe and Johansen, 2012). In AIPARS, automation using AI-based technologies shall offer customers better flexibility and control over

the shopping activities making it effort-free for the customers. Hence, it can be predicted that OMM would influence PEE of shopping at AIPARS. Thus, hypothesized as below:

H_1: OMM regarding new retail technology positively affects the PEE of shopping at AIPARS.

OMM makes individuals think that new technology provides flexibility, improves productivity and control over the tasks in their life (Parasuraman and Colby, 2015) Hence, individuals perceive that technology is beneficial to them (Tsikriktsis, 2004; Walczuch, et al., 2007). The extant literature found the influence of OMM on PFL (Ali et al., 2015; Rahman et al., 2017; Jin, 2013; Chen and Lin, 2018; Godoe and Johansen, 2012). The adoption study of self-service technology by Lundberg, (2017) found that OMM influences PFL. In AIPARS, the automation using AI technology provides greater flexibility, productivity and control over the shopping activity, which will develop a positive view and belief regarding its utility in the consumer's mind. Hence, it is proposed:

H_2: OMM regarding new retail technology positively affects the PFL of shopping at AIPARS.

INN is a positive factor and driver for TR. INN is conceptualized as the consumer's adventurous behaviour towards the utilization of technology (Kotler and Armstrong, 2012). Consumers, who have an innovative mindset may think that technology is easy to employ for a particular task (Walczuch et al., 2007; Godoe and Johansen, 2012). INN is the vital antecedent of adoption of technology (Liljander et al., 2006) The extant literature confirm the effect of INN on PEE (Rahman et al., 2017; Ali et al., 2015; Chen and Lin, 2018; Kim and Chiu, 2019; Erdoğmu and Esen, 2011). As AIPARS is fully driven by innovative retail technology such as 3D beauty mirror, a robotic shopping cart that makes it easy for the consumers to carry out their shopping activities, hence it is proposed that:

H_3: INN regarding new retail technology positively affects PEE of shopping at AIPARS.

The consumers who have an innovative mindset towards technology generally possess good knowledge of technology and feel that learning new technology is interesting (Parasuraman and Colby, 2001). These innovative consumers feel that technology is useful and easy to use (Lin et al., 2007). The studies regarding the acceptance of mobile payment (Martens et al., 2017) and

health apps (Chen and Lin, 2018) found that there is no association between INN and PFL. The new technology acceptance studies confirm the influence of the INN on PFL (Kim and Chiu, 2019; Ali et al., 2015). Accordingly, AIPARS is also new innovative technology and has features such as product-price comparison, retail in-store features such as interactive dressing mirrors and futuristic smart mirrors, so INN is expected to influence the PFL of shopping. Hence, hypothesized as:

H_4: INN regarding new retail technology positively affects PFL of shopping at AIPARS.

Generally, DIF creates apprehension about new technology usage and it might affect the individuals negatively for new technology usage. However, it's not necessary that it will always influence negatively (Erdoğmu and Esen, 2011; Martens et al., 2017). It is found that DIF negatively influences the PEE of new technology such as sports wearable devices (Kim and Chiu, 2019), e-participation tools (Ali et al., 2015), Facebook usage (Jin, 2013) and Mobile payment (Martens et al., 2017). AIPARS has sophisticated technologies such as robotic shopping carts, product finder apps which might overwhelm the consumers and they may find it tough to use. Therefore, it is essential to explore the association between DIF and PEE:

H_5: DIF towards new retail technology negatively affects PEE to shop at AIPARS.

DIF is conceptualized as the technological anxiety and phobia the consumers have towards technology (Parasuraman, 2000). It represents the negative feeling the consumers have about the new technology (Cambre and Cook, 2005). The new technology studies show that DIF negatively influences the PFL (Kim and Chiu, 2019; Jin, 2013). Extant literature also found that there is no association between DIF and PFL (Erdoğmu and Esen, 2011; Ali et al., 2015; Walczuch et al., 2007). AIPARS has automated technologies related to finding products, product trials and purchases, which might give consumers a sense of being besieged by the technology and skeptical about its effectiveness. So it is anticipated that:

H_6: DIF towards new retail technology negatively affects PFL of shopping at AIPARS.

INS means individuals do not feel secure to exploit a new technology due to the absence of trust for the usage of new technology. INS is another negative factor and inhibitor of technology

readiness (Kuo et al., 2013). INS negatively affects the adoption of new technology (Parasuraman and Colby, 2001). The extant literature of new technology acceptance shows that INS influences PEE negatively (Jin, 2013; Kim and Chiu, 2019; Martens et al., 2017) and it is also found that there is no association between INS and PEE (Erdoğmu and Esen, 2011; Ali et al., 2015; Rahman, et al., 2017). Hence, insecure consumers are in ambiguity regarding the usage of technology (Godoe and Johansen, 2012). AIPARS epitomizes technology-based automated stores, which are new to the consumers and customers might feel insecure while doing shopping, which lacks human intervention, is effort-free along with single-click payments. Hence, the hypothesis is proposed:

H_7: INS regarding new retail technology negatively affects PEE to shop at AIPARS.

Consumers having insecurity would be less technology-dependent and feel that at critical moments technology will fail (Kotler and Armstrong, 2012; Parasuraman and Colby, 2001). INS is considered an important factor for less technology usage (Tsikriktsis, 2004). The present literature demonstrated that INS negatively influences the PFL of new technology (Kim and Chiu, 2019; Jin, 2013; Walczuch et al., 2007; Rahman et al., 2017). Extant literature also discusses that there is no association between INS and PFL (Erdoğmu and Esen, 2011; Ali, et al., 2015; Martens et al., 2017). INS is mainly associated with a lack of trust in technology. Hence, it negatively influences the acceptance of technology (Parasuraman and Colby, 2001). Consumers might feel insecure, as shopping transactions at AIPARS are fully technology-driven. Therefore, the hypothesis is formed:

H_8: INS regarding new retail technology negatively affects PFL of shopping at AIPARS.

PEE and PFL are major predictors of technology adoption (Davis, 1989). The new technology adoption studies show the relationship between PEE and PFL (Martens et al., 2017; Huang et al., 2012; Joo and Sang, 2013). It is found that “the easier a technology is to use, the more useful it can be” (Venkatesh, 2000, p. 343). PEE influences the PFL of shopping using Smart retail technology (Roy et al., 2017), mobile shopping using smartphones (Natarajan et al., 2017) and mobile payment (Martens et al., 2017). The acceptance of the AR App study found that there is no association between PEE and PFL (Rese et al., 2017). Customers can shop effort-free at

AIPARS as it is a fully automated store and only AI-based technologies will provide utility and assist consumers. Hence the below relationship is examined:

H_9: PEE positively influences the PFL of shopping at AIPARS.

SHN considers the shopping intention of an individual to shop in AIPARS which discusses the subjective possibility of an individual's engagement in certain shopping behaviour (Fishbein and Ajzen, 1975). PEE is an antecedent for the acceptance of technology (Davis, 1989). The study of the adoption of M-commerce found that PEE influences the intention to adopt (Kalinic and Marinkovic, 2016) and online shopping (Cho and Sagynov, 2015; Gefen et al., 2003). Technology acceptance research reveals the influence of PEE on the use intention (Kim and Chiu, 2019; Jin, 2013; Driediger and Bhatiasevi, 2019). However, many studies confirm that PEE does not influence behavioural intention of the usage of technology (Basgöze, 2015; Agrebi and Jallais, 2015). AIPARS are fully automated stores and consumers might feel it easy to shop, which might affect their intention of shopping. Hence, it is proposed as:

H_{10}: PEE positively influences the SHN at AIPARS.

When the customers feel the technology would be helpful to improve performance, they tend to accept the technology (Davis, 1989). PFL affects the use intent of e-shopping (Ha and Stoel, 2009) and mobile SHN (Chen et al., 2018). PFL influences customers to adopt smart products (Mani and Chouk, 2018). The research related to new adoption of new technology also proves the effect of PFL on behavioural intention to use (Fu et al., 2018; Kim and Chiu, 2019; Liu et al., 2019; Lu et al., 2019; Martens et al., 2017; Erdoğmu and Esen, 2011; Tsai et al., 2019). For shopping at AIPARS, consumers use AI-based technologies and it saves time, provides alerts, helps in product finding and payment transactions are automated. Hence, consumers may feel that shopping at AIPARS is useful. The hypothesis is thus presented-

H_{11}: PFL positively influences the SHN at AIPARS.

PEJ means the level to which the usage of computers is supposed to be pleasurable apart from its performance outcomes which are expected (Davis et al., 1992). It is also found that PEJ is an

important predictor of consumer buying behaviour (Davis et al., 1992). PEJ is discussed in studies regarding e-commerce and m-commerce (Chen and Tan, 2004; Hausman and Siepke, 2009) and AR apps (Rese et al., 2017). AI technology at retail stores provides the enjoyment to the consumers (Kahlert et al., 2016; Kahn et al., 2018; Liu et al., 2018; El hamy and Hassanein, 2017; Brill, 2018; Tamilmani et al., 2019). It is found that high perceived enjoyment leads to a rise in technology acceptance (Davis et al., 1992; Kahlert et al., 2016). PEJ influences the consumer intention towards the online retailer (Lee, Fiore and Kim, 2006). AIPARS are fully automated stores with exciting offers, product finder apps, magic mirrors and robotic shopping carts. Hence, consumers might find it enjoyable to shop at AIPARS. Consequently, it is proposed-

H_{12}: PEJ positively influences the SHN at AIPARS.

CST is discussed as the degree to which an organization caters to the various needs of the customers (Liao and Xu, 2005) and it is a vital antecedent of consumer behaviour in online shopping (Cho and Fiorito, 2009) m-commerce (Kalinic and Marinkovic, 2016; Morosan, 2014), and retail malls (Kesari and Atulkar, 2016). AI technology at retail stores provides customized experience (Pierdicca et al., 2015; Kahn, et al., 2018; Chopra, 2019) to customers. It is found that CST influences customer satisfaction (Shao et al., 2009) and positively affects m-commerce use intention (Liébana-Cabanillas et al., 2017). AIPARS provides customized information and deals about the products through various mobile apps and signboards, which might affect the shopping intention. Therefore, the following hypothesis is presented:

H_{13}: CST positively influences the SHN at AIPARS.

INY is mainly important for the exchange between the customer and business (Srinivasan et al., 2002; Ballantine, 2005). INY is an important predictor of behaviour of consumers at smart retailing (Roy et al., 2017). The literature mention that interactivity is an antecedent of consumer's online shopping experience (Srinivasan et al., 2002; Chen and Chang, 2003; Yang and Wu, 2009) and AI technology adoption (Pantano et al., 2017; Cowan and Ketron, 2018; Etemad-Sajadi,2016). It is found that interactivity is one of the predictors of satisfaction of consumers in an online retail setting (Ballantine, 2005). INY of a website is one of the main

predictors of buying intention (Park, 2012; Aladwani and Palvia, 2002). AIPARS has technology, which is very interactive that helps in product finding, alerts for shopping, interactive retail furniture such as interactive dressing room and In-store neuroscience stylist. Accordingly, it is proposed-

H_{14}: INY positively influences the SHN at AIPARS.

Research Methodology

This section describes the survey instrument along with the process for data collection.

Research Survey Instrument Design

The literature of TR and technology adoption (Parasuraman, 2000; Rojas-méndez et al., 2015; Davis, 1989; Parasuraman and Colby, 2015; Lam et al., 2008) is used to develop measurement scale. The measurement scales used for the variables are PEJ (Davis et al., 1992), INY (Ballantine, 2005; Srinivasan et al., 2002) and CST (Kalinic and Marinkovic, 2016; Shao et al., 2009) which are adapted and modified from present studies. The validity of the constructs and reliability of the scales are checked as it is imperative (Fornell and Larcker, 1981),

Prior to the data collection, six AI subject matter experts from the retail industry and Retailers Association of India (RAI) were involved to discuss the survey questionnaire and they were informed about the objectives and scope of this research. To confirm the face validity of the survey instrument, the suggestions and comments from these experts were incorporated in the questionnaire for appropriateness of the constructs and the pilot questionnaire was confirmed. To calculate the operationalized latent variables, a five-point Likert scale was considered. To evaluate the internal consistency of the data and reliability, Cronbach alpha was used for both pre-test (120 respondents) and pilot test (260 respondents). After acceptable results in the pilot study, the collection of primary data was done. The operationalized constructs are mentioned in Table II.

Table II. Measurement Model Summary

Construct	Measures	Factor Loading
Optimism (OMM) AVE = .728 CR = .901 α = .821	New retail technologies like AIPARS assist in decent life quality.	0.880
	New retail technology like AIPARS convenient for people.	0.891
	New retail technology like AIPARS helps people to manage their shopping properly.	0.803
	New retail technology like AIPARS helpful in making my life efficient and effective.	0.853
	I like new retail technology - AIPARS as it provides more freedom to me while shopping.	0.893
Innovativeness (INN) AVE = .732 CR = .893 α = .807	For using new AIPARS technology, Many people contact me for help and guidance.	0.889
	Typically, I would be the first person to shop using new retail technology in retail malls.	0.811
	I generally understand new retail technology in retail malls and do not require help from anybody.	0.895
	I am interested to know the latest trends in technology in retail space.	0.819
	I would find lesser problems than others in using new retail technology such as AIPARS in retail malls for shopping.	0.873
Discomfort (DIF) AVE = .742 CR = .882 α = .812	I feel that if other people know more retail shopping technology than me they take advantage over me.	0.887
	I can't figure out the technical display or support boards for technical help as they don't illustrate my level of understanding of retail technology in shopping malls.	0.812
	I feel that new retail technology in malls and AIPARS is not designed properly which can be understood by any individual person.	0.877
	The instruction manuals of new retail technology in retail malls are not written in simple/layman language to be understood by any individual.	0.830
	I feel that Technology used at AIPARS would always fail at the worst expected time.	0.898
Insecurity (INS) AVE = .737 CR = .899 α = .824	I don't feel secure shopping at AIPARS.	0.840
	The human touch is very important while shopping at AIPARS.	0.807
	When I have to only shop at AIPARS; I do not feel confident.	0.846
	I am worried that while shopping at AIPARS, Someone will misuse my data which is provided by me while shopping.	0.855
	For shopping at retail malls, the human presence	0.808

	is imperative.	
Perceived Usefulness (PFL) AVE = .737 CR = .879 α = .824	Shopping at AIPARS would be helpful in saving my time.	0.862
	Using AIPARS would improve performance in shopping.	0.891
	Using AIPARS would help in faster shopping.	0.846
	Using AIPARS would enhance my effectiveness in shopping.	0.873
	It is easier to do my shopping transactions at AIPARS.	0.841
	Overall, AIPARS would be useful for shopping.	0.875
Perceived ease of use (PEE) AVE = .747 CR = .876 α = .821	For me, it is simple and effort-free to learn to shop and operate at AIPARS.	0.864
	It easy to shop at AIPARS what I want it to shop for.	0.890
	The use of the AIPARS is understandable and clear.	0.871
	I can easily remember how to perform tasks in AIPARS.	0.886
	I find the shopping at AIPARS is overall simple to use.	0.823
Perceived Enjoyment (PEJ) AVE = .713 CR = .874 α = .831	Shopping at AIPARS would truly be a joy.	0.861
	To me, shopping at AIPARS would be an adventure.	0.865
	To me, shopping at AIPARS would be a thrill.	0.863
	I enjoy shopping at AIPARS.	0.888
	To me shopping at AIPARS would be stress-relieving.	0.810
	I would have a good time in AIPARS	0.823
Customization (CST) AVE = .798 CR = .923 α = .815	AIPARS would provide purchase suggestions which suit my requirements.	0.867
	AIPARS would enable me to purchase products that are suitable for me.	0.862
	The promotions and advertisement that AIPARS provide me are perfectly suitable as per my shopping requirement.	0.866
	AIPARS would make me experience like a unique customer.	0.829
	I am confident that AIPARS would be customized as per my requirement.	0.852
Interactivity (INY) AVE = .745 CR = .921 α = .817	AIPARS would enable me to see the merchandise from different angles.	0.855
	AIPARS would have search tools that enable me to locate products.	0.830
	AIPARS have tools that make product comparisons easy.	0.821
	Shopping at AIPARS is very engaging.	0.814

	Shopping at AIPARS is very dynamic.	0.812
Shopping Intention (SHN) AVE = .733 CR = .882 α = .835	I will shop at AIPARS for my shopping.	0.845
	I am likely to suggest my friends shop at AIPARS.	0.833
	If I have a shop, I would use AIPARS.	0.823
Note: AVE-Average Variance Extracted, CR-Composite Reliability, α-Cronbach's Alpha.		

Sampling and Data Collection

For the collection of primary data, the (Table II) structured questionnaire was administered to the respondents. Mumbai and Pune city were chosen for the survey as these are the modern retail hubs of India (Das, et al., 2017). The target respondents selected were those customers, who were conversant shopping in retail shopping malls or online using mobile and any other type of technology. The video about the AIPARS concept and its information leaflet provided the knowledge about AIPARS to the respondents and then the final questionnaire was administered as done in the pre-test and pilot test. These respondents were appropriate as they were using some kind of technology for shopping at malls as well as have substantial disposal income, average education and they were residing in urban areas as per Table III. Secrecy of their identity and anonymity of their responses were confirmed to the respondents. These consumers were surveyed in retails shops and shopping malls in Mumbai and Pune city utilizing the convenient sampling method. To reduce bias, the survey was done at different periods of time and days. The data collection was done over the period of seven months. Total 2400 questionnaires were administered. While screening, the authors found that 800 (33.3%) questionnaires were incomplete as those questionnaires were not completely filled by the respondents. The remaining 1600 questionnaires were screened for data and 350 (14.6%) respondents were found unengaged as the deviation rate was zero among the responses. Finally, 1250 questionnaires were found complete and appropriate for analysis in all respects after removing the unengaged and incomplete responses and the response rate is 52.1%.

Non-response Bias

The t-test was done to analyze the difference in the response between the early wave (710) and late wave (540) groups (Armstrong and Overton, 2017; Tsou and Hsu, 2015). The result

(p=0.48) proved that non-response bias is not there. The total responses found to be fit in all respects were 1250.

Common Method Bias and endogeneity

The single factor Harman test (Wang, Wang and Lin, 2018; Podsakoff et al., 2003; Podsakoff and Organ, 1986; Abdallah et al., 2017) was done to scrutinize the existence of common method bias. As per the result, the variance was 23.68% explained by a single factor, which is below 50%. It is proved that common method bias is not in the study. Therefore, the reliability and validity of the measures were established. Additionally, Recursivity in the structural model may cause endogeneity (Lai et al., 2018; Dubey et al., 2018). The variance in an exogenous variable may be endogenous to the model (Guide and Ketokivi, 2015) as the cross-sectional data may result in a misspecified model. Hence, a Ramsey regression equation error test was employed (Lai et al., 2018) and ascertained that the endogeneity was not an issue in the proposed model. Hence, the validity and reliability of the measures were proved.

PLS-SEM

PLS-SEM is a variance-based path modeling method which has the capability to symbolize variables with multiple indicators in the study. PLS-SEM makes limited distributional assumptions of OLS regression (Chin et al., 2008). PLS-SEM is employed to test conceptual models and causal relationship between the latent constructs and its indicators (Gudergan, et al., 2008). Compared to the maximum likelihood method, PLS-SEM is a flexible method preferred to model the constructs in research (Henseler and Chin, 2010). PLS-SEM is employed in studies when the research purpose is the extension of the present theory (Hair et al., 2011). PLS-SEM has also been employed in several retail technology adoption studies for shopping behavior (Chebat et al., 2014; Rezaei et al., 2016; Rahman et al., 2016; Ogonowski et al., 2014). Hence, the data analysis was done employing the Smart PLS 2.0 by the authors (Ringle et al., 2005).

Data Analysis and Results

Table III depicts that 38% of respondents surveyed were using technology for shopping from the last six months and 62% for more than a year. 36% of the respondents were graduates and 32%

were post-graduates. It was found that 59% were male and 41% were female respondents. 34% of respondents were in the 21-30 yrs. age group while 31% were in the 31-40 yrs. age group.

Table III. Demographic Profile (N=1250)

Demographic	Characteristics	Frequency	Percentage
Gender	Female	512	41
	Male	738	59
Age (yrs.)	21 to 30	420	34
	31 to 40	380	31
	41 to 50	230	18
	51 to 60	220	17
Education	No degree	180	14
	Diploma Program	220	18
	Graduate	450	36
	Post Graduate	400	32
Income (Monthly)	< Rs. 25,000	325	26
	Rs. 25,000 - Rs. 50,000	312	25
	Rs. 50,000 - Rs. 1,00,000	325	26
	Rs. 1,00,000 - Rs. 1,50,000	288	23
Prior experience of using technology for shopping	More than 6 months	475	38
	More than 1 year	775	62

Measurement Model

PLS-SEM was utilized for the testing of the conceptual model. PLS-SEM is popularly used in social science studies as it is suitable for non-normal data and supports small as well as large sample sizes (Hair et al., 2014; Hair et al., 2017). The Smart PLS 2.0 software was applied for the analysis of primary data. The measurement properties for the reflective latent constructs having multiple indicators in the final model were calculated.

High internal consistency of all the constructs is confirmed as the value of Cronbach alpha was above 0.7 (Nunnally, 1978). As per Table II, CR values confirm the high level of reliability and internal consistency of all the constructs as the outer loading for all the items were higher than the threshold value of 0.6. The AVE values are greater than the threshold value of 0.5, so the convergent validity for all the constructs is proved (Hair et al., 2017; Wang et al., 2013; Guadagnoli and Velicer, 1988).

The comparison of the inter-correlations of the constructs with the AVE off-diagonal values as mentioned in Table IV proves the discriminant validity. Discriminant validity between the

constructs is verified (Fornell and Larcker, 1981), as the shared variance values were lower than the corresponding AVE.

Table IV. Discriminant Validity

Research Construct	OMM	INS	DIF	INY	PEE	PFL	PEJ	CST	INY	SHN
OMM	**0.853**									
INS	0.578	**0.855**								
DIF	0.489	0.680	**0.861**							
INY	0.541	0.621	0.512	**0.859**						
PEE	0.458	0.459	0.489	0.524	**0.864**					
PFL	0.378	0.578	0.452	0.621	0.624	**0.858**				
PEJ	0.214	0.489	0.381	0.548	0.521	0.677	**0.844**			
CST	0.301	0.348	0.420	0.542	0.470	0.548	0388	**0.893**		
INY	0.198	0.322	0.566	0.489	0.348	0.248	0.243	0287	**0.863**	
SHN	0.172	0.188	0.524	0.482	0.254	0.211	0214	0.154	0.351	**0.856**

Structural Model

The validity and reliability of the measurement model was confirmed and then the path analysis was done to examine the relationship between the constructs using the structural model and exhibited in Figure II. The calculations of the path coefficients and its significance level are mentioned in Table V.

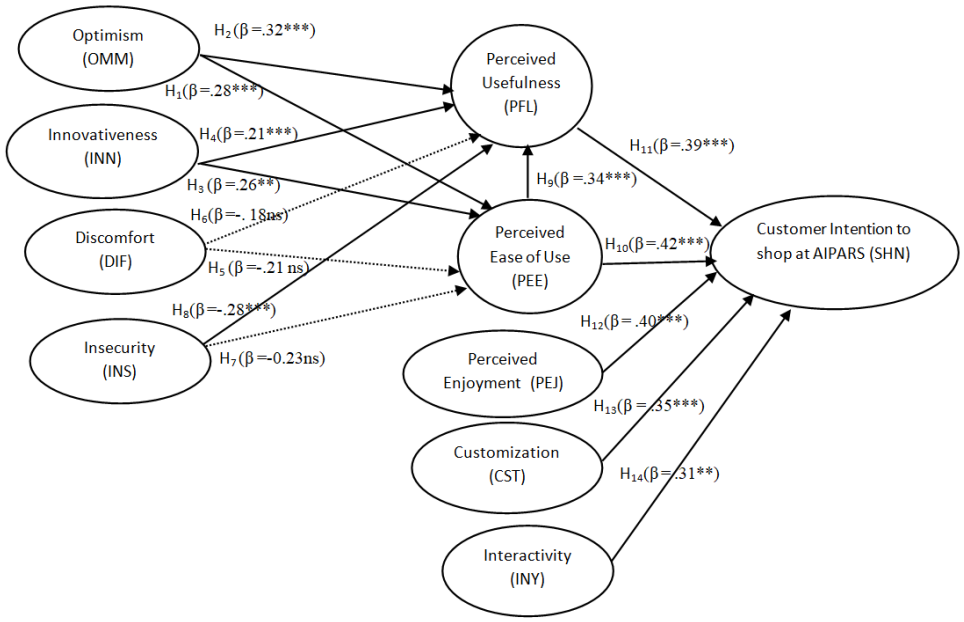

Figure II. Conceptual Model of Customer Intention to shop at AIPARS

Table V. Path Coefficients

Hypothesis	Path	Path Coefficient	T Statistics	Decision
H_1	OMM → PEE	0.285	3.521***	Supported
H_2	OMM → PFL	0.322	3.803***	Supported
H_3	INN → PEE	0.266	2.370**	Supported
H_4	INN→ PFL	0.217	3.114***	Supported
H_5	DIF → PEE	-0.217	1.501	Not Supported
H_6	DIF → PFL	-0.189	1.330	Not supported
H_7	INS → PEE	-0.239	1.204	Not Supported
H_8	INS → PFL	-0.288	3.588***	Supported
H_9	PEE → PFL	0.340	4.363***	Supported
H_{10}	PEE → SHN	0.423	3.641***	Supported
H_{11}	PFL → SHN	0.392	3.091***	Supported
H_{12}	PEJ → SHN	0.406	4.084***	Supported
H_{13}	CST → SHN	0.356	2.642***	Supported
H_{14}	INY → SHN	0.315	2.403**	Supported

a. t-values for two-tailed test : *** t-value 2.58 (sig. level = 1%), **1.96 (sig. level = 5%) and * t-value 1.65 (sig. level = 10%), (Hair et al. 2011)

The results indicate that OMM significantly influences the PFL (β=0.32, p<0.01) and PEE (β= 0.28, p<0.01) of AIPARS (Ali et al., 2015) which contradicts the previous study (Kumar and Mukherjee, 2013) as it mentioned that OMM does not affect the PFL of new technology. Customers are optimistic about the PEE and PFL of AIPARS technology in retail stores as they are already using some form of technology for shopping in retail malls. The INN of the individuals positively affects the PEE (β=0.26, p<0.05) and PFL (β=0.21, p<0.05) (Godoe and Johansen, 2012; Ali et al., 2015) which shows that customers have an innovative mind-sets and they perceive AIPARS technologies to be user-friendly and useful for shopping.

The results mention that DIF does not influence PEE (β= -0.21, ns) and PFL (β= -0.18, ns) of AIPARS and contradicts the study on self-service technology (Kallweit et al., 2014). Customers do not perceive discomfort as they are conversant with using the technology available at retail malls. Hence, DIF does not contribute to PFL and PEE. INS does not affect PEE (β= -0.23, ns),

but negatively affects PFL (β= -0.28, p<0.01) (Parasuraman and Colby, 2015; Godoe and Johansen, 2012) which shows that insecurity is a concern for customers. PEE influences the PFL (β=0.34, p<0.01) of shopping (Roy et al., 2017) at AIPARS. PEE (β= 0.42, p<0.01) and PFL (β=0.39, p<0.01) positively influences the behavioural intention to shop (Chen et al., 2018) at AIPARS, which conveys that customers have the intention to shop at AIPARS.

PEJ positively influences the SHN (β=0.40, p<0.01) at AIPARS as customers perceive fun and enjoyment while shopping at AIPARS which supports the study of online shopping (Rese et al., 2017; Chen and Tan, 2004). CST positively influences the SHN (β=0.35, p<0.01) and it supports the m-commerce and retail malls (Liébana-Cabanillas et al., 2017; Kesari and Atulkar, 2016; Morosan, 2014). At AIPARS, there are more customized services offered to shoppers due to AI-based technologies. INY influences positively to SHN (β=0.31, p<0.01) which conveys that due to AIPARS technologies, interactivity is high. Hence INY positively influences SHN (Park, 2012; Aladwani and Palvia, 2002).

Discussion

This is the first study in a developing country, which examines the shopping intention of customers at AIPARS by adding context-specific variables to the TRAM model. This study found that OMM influences the PEE and PFL as consumers are optimistic about AIPARS (Ali et al., 2015). Customers perceive that it fulfills their shopping needs by providing them with more convenience, freedom and control over their shopping activity as well make them more productive in their personal life. Product finding systems like @WalmartLabs (Beklemysheva, 2018) or Retail Site Intelligence (Lee and Lee, 2015) used in AIPARS will help customers find products easily. INN also influences the PEE and PFL of AIPARS (Godoe and Johansen, 2012). Customers have innovativeness towards using new technology, as they are frequent shoppers, aware, interested and updated about the latest technology trends and easily understand new technologies such as AIPARS in the retail space.

Discomfort negatively affects PEE and PFL; however, it is not significant as most of the customers are conversant using some form of technology while shopping and it contradicts the study on self-service technology (Kallweit et al., 2014). The “Digital India” program by the

Government of India promotes the use of technology, so customers do not perceive discomfort with the new AIPARS technology. Insecurity does not influence the PEE; however, it negatively influences the PFL of shopping at AIPARS. The consumers are currently using technology in retail malls and find the ease of use to shop at AIPARS. However, customers still feel that their personal, confidential financial data at shopping malls is not safe and secure and may be misused as they are using digital payment systems for shopping. Consumers prefer the human touch while shopping and at AIPARS, this human touch would be missing. Hence, INS negatively affects the PFL (Parasuraman and Colby, 2015; Godoe and Johansen, 2012).

It was found that PEE influences the PFL which is proved in many prior studies (Natarajan et al., 2017; Roy et al., 2017;). This implies that if consumers find the ease of use at AIPARS, they shall surely perceive it to be useful. PEE and PFL positively affect the intention to shop at AIPARS (Chen et al., 2018) Nowadays, customers frequently visit retail malls and are already familiar with the new technology-based retail. Hence, they feel that shopping at AIPARS will be faster, easier and useful as it would enhance their effectiveness while shopping.

PEJ influences the shopping intention at AIPARS as most of the people visit the shopping malls for fun and enjoyment. It is confirmed that PEJ positively affects the behavioural intention to shop using smart in-store technology (Kim, 2018; Lee, Fiore and Kim, 2006; El Shamy and Hassanein, 2017). Shopping at AIPARS would be fun, enjoyment, adventurous and the customers find stress relieving for the customers as the new technology at AIPARS such as 3D Mirror, Clarks' Feet Measurement Technology and Futuristic Smart Mirror exciting.

CST influences the SHN at AIPARS (Liébana-Cabanillas et al., 2017). Virtual assistants, chatbots and robots provide personalized information, which is suitable for customers to shop at AIPARS. Deep learning algorithms and machine learning techniques provide personalized recommendations, promotions and advertisements as per the individual shopping requirement at AIPARS. When customers get such personalized and customized information, they feel special and unique.

INY influences the SHN at AIPARS (Park, 2012; Aladwani and Palvia, 2002; Cowan and Ketron, 2018). Technologies such as RFID-enabled Magic Mirror, RFID enabled Interactive Fitting Rooms, 3D Mirrors and Futuristic Smart Mirror technologies at AIPARS provide higher

interactivity. Also, humanoid robots and personal digital assistants provide information to locate a particular product and provide product comparisons very easily. Interactivity is important to engage the customers and provide a dynamic shopping experience.

Contributions

As the retail sector is at the cusp of embracing high-end technologies (Alexander, 2019) such as AI-based 'smart' retail technologies, there exists meager scholarly research work that specifically examined the retail industry-related AI-based technologies. The existing studies are mostly qualitative or conceptual in nature (Voropanova, 2015; Pantano, 2014) that focus on smart technologies and its applications from a retailer outlook such as applications in supply chain management (Fan, et al., 2015). This research takes a step further on prior studies carried out on customer adoption of smart retail technologies such as RFID and AR systems (Huang and Liao, 2015). Retailers are concerned about the capability to add value to the customers with its successful adoption (Niemeier, et al., 2013). Studies have been conducted on augmented reality apps for shopping (Rese, et al., 2017) and virtual and immersive technology usage in a retail store (Pantano and Servidio, 2012) to understand the consumer buying behaviour. Hence, it is necessary to further investigate AI-based retail technologies such as AIPARS from both customer and retail firm perspectives. Lately, there has been greater demand and attention to scrutinize the role of smart retail technologies and service innovation in the retail sector (Wuenderlich et al., 2015; Chiu and Hofer, 2012).

This study has theoretical implications as it provides a comprehensive framework to study the consumers' shopping intention at AIPARS. The suggested framework theoretically interweaves the individual specific constructs of TR with system-specific constructs of TAM to explain the psychological process of consumers' shopping intention by establishing linkages with three context-specific constructs such as PEJ, CST and INY particular to AI-based technologies in the retail sector. This work is the first research to extend the TRAM model (Lin et al., 2007) with AIPARS context-specific variables. To provide a better explanatory power in the context of emerging technology, variables- PEJ (Chen and Tan, 2004; Hausman and Siekpe, 2009; Kahn et al., 2018; Kshetri, 2018; El Shamy and Hassanein, 2017), CST (Kalinic and Marinkovic, 2016; Pierdicca et al., 2015; Kahn et al., 2018) and INY (Yang and Wu, 2009; Berman, 2019; Pantano et al., 2017; Cowan and Ketron, 2018; Speicher et al., 2017) are integrated with the TRAM

model. This research fills up the theoretical gap in IT adoption literature and adds value to the AI adoption research literature by providing the consumers' individual perspectives as well AI-specific variables in a single proposed model (Pantano et al., 2017; Alaiad and Zhou, 2016; Yang et al., 2018; Gursoy et al., 2019; Brill, 2018). It examines the customers' shopping intention at AIPARS.

It adds value to the present literature of new technology adoption and retorts to the demand for scholarly work in this domain by empirically investigating the customers' shopping intention at AIPARS. Hence, this work adds to the emerging area of research on innovations in services using AI-based technologies. This research has implications to extant literature of retail management, consumer behaviour and information systems. This paper tries to plug the theoretical gap by scrutinizing the influence of emerging technology characteristics on the shopping behaviour of consumers in the retail sector with specific emphasis on the effect of AI technology in retail stores on the shopping intention of the consumers

Managerial Implications

This study found that customers are optimistic and possess innovativeness about technology and do not have discomfort for the usage of technology, which is beneficial for managers of AIPARS as customers have a positive viewpoint towards new retail AIPARS technology. This study found that insecurity is an important issue, as customers feel insecure that their personal data at AIPARS is not safe. INS negatively influences the PFL, so retail managers should ensure that customer data is secured and AI system developers, programmers and algorithm designers should keep this in mind while developing AI-based retail solutions. Consumers should be trained regarding the security mechanisms for their personal information in retail malls. Customers also should be well informed regarding the security issues related to their data. In case customers face any issue, they should be made aware by the managers regarding the systems and processes to resolve the issue. There should be customer care centers, which actively support customer issues regarding security. The managers should develop systems to inform customers about fraud and unauthenticated data usage and measures to resolve the same. It is found that PEE influences PFL, so managers must train the customers to use AI-based technology at retail malls to improve PEE. Retail managers need to ensure that the technical support staffs are well trained and readily available at the store to cater to routine technical issues

and major contingencies. Technical manuals, display boards, hoardings and signs for technical help regarding the AI-based technologies are designed in simple, clear and understandable language, which is user-friendly. Voice-based assistance should be provided in local languages so that customers are at ease to shop at AIPARS. PEE and PFL influence the shopping intention at AIPARS. Hence, store managers should ensure the same by ensuring proper training of retail shop floor staff and customers.

The PEJ, CST and INY play a crucial role in the shopping intention at AIPARS. Hence, retail managers should ensure that the AI-based technologies at AIPARS are designed to provide the customer's fun, enjoyment, adventure, excitement and stress-relieving experience while shopping. The AIPARS technologies such as robot shopping cart, mobile apps integrated with AIPARS, discount coupon apps, interactive dressing rooms, 3D mirrors, futuristic smart mirrors and product location mobile apps should be designed to provide fun-filled experience to the consumers. Store managers should ensure that customers are provided with personalized recommendations, promotions and advertisements as per their individual shopping requirements to make them feel unique. These mobile apps related to a recommendation should be made store-specific and customer-specific so that customers can feel personalized. Customers should be provided with quick and accurate information to locate a particular product in the store and do product comparisons very easily, as interactivity is important to engage the customers with a dynamic and seamless shopping experience. Interactivity can be maintained by the retailers using interactive mirrors, robots and mobile apps so that customers receive alerts and messages as and when required during shopping at AIPARS. To summarise, this study will aid the retail managers to cultivate a better comprehension of AI-based technologies in retail and build effective strategies to improve the customer shopping behaviour in AIPARS and establish a competitive advantage.

Conclusion

This study aimed to provide a highlight on AIPARS adoption behaviour of consumers in India as AIPARS is at the inception stage. The model of this study was developed considering prior IT technology adoption research (Parasuraman, 2000; Lin et al., 2007; Davis, 1989) and considered three context-specific factors PEJ, CST, INY with reference to AIPARS (Venkatesh, 2000; Lee and Benbasat 2004; Steuer, 1992). The proposed model was examined using the PLS-SEM

method and it adequately explained the behavioural intention to shop at AIPARS (69.2%). Further studies can be called upon to investigate consumer satisfaction and loyalty to shop at AIPARS. Social interaction can be studied further as there will be minimal / no human assistance while shopping.

The results found that that OMM and INN influence the PFL and PEE which reveals that people are innovative and set to accept new technology; however, INS still persists in consumers' minds, so it influences the PFL. INS does not influence the PEE which contradicts the study (Godoe and Johansen, 2012). DIF does not influence the PEE and PFL which shows that consumers' do not have discomfort with technology, which contradicts the study by (Kallweit et al., 2014) on self-service technology. PEE and PFL are predictors of SHN of AIPARS. Other important findings are that the context-specific factors- PEJ (Rese et al., 2017), CST (Kesari and Atulkar, 2016; Morosan, 2014) and INY (Park, 2012) influence the SHN at AIPARS which supports the existing studies. This study shows that consumers are ready to shop in consideration of the above factors; however, insecurity is still an issue regarding the adoption of AIPARS. This study provides the model to understand the SHN at AIPARS by adding three context-specific variables to the TRAM model (Lin et al., 2007). This study finally suggests the pressing need for further studies of the consumer behaviour at AIPARS and leveraging of technology for automation of service in the retail sector.

Limitations and Future Research Lines

This work is the primary step towards understanding the behavioural intention to shop at AIPARS, which is expected to commence soon in India which is a developing economy. This study has limitations, as this cross-sectional study surveyed the customers in India, it has a geographic limitation and attention needs to be given while generalizing the findings in other contexts. This survey can be extended to other developing countries across various cultures with demographic factors like gender, age, education and income group studied on a comparative ground. Further research can be done with more variables like store reputation, customer value, perceived risk, trust, service quality, customer loyalty, customer experience and customer satisfaction, once the AIPARS kick-starts in India. Since the model was tested only in the Indian context, it opens up further avenues of research in other emerging countries and settings, which

may comprise regional environments such as SAARC and BRICS. Future studies may also be conducted from the retailer's viewpoint.

APPENDIX

Table: List of Acronyms

Acronym	Details
AI	Artificial Intelligence
AIPARS	Artificial Intelligence Powered Automated Retail Stores
TRAM	Technology Readiness and Acceptance Model
TR	Technology Readiness
TAM	Technology Acceptance Model
OMM	Optimism
INN	Innovatiness
DIF	Discomfort
INS	Insecurity
PEJ	Perceived Enjoyment
CST	Customization
INY	Interactivity
SHN	Shopping Intention
PEE	Perceived Ease of use
PFL	Perceived usefullness

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