TRY-ON WITH AR: IMPACT ON SENSORY BRAND EXPERIENCE AND INTENTION TO USE THE MOBILE APP

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ABSTRACT

To build user interfaces, modern immersive platforms are rapidly being used to create customer experiences. The present research aims to examine the efficacy of augmented reality in the production of sensory brand experience and intention to use the mobile app with an integrated AR feature. Following the Technology Acceptance Model and Uses and Gratifications Theory, this research uses utilitarian benefits (perceived ease of use and perceived usefulness) and hedonic benefits (perceived enjoyment and flow experience), in defining the essential factors that need to be considered while integrating AR in a mobile app. Primary data were collected from 168 respondents who were made to use the AR feature on the Lenskart mobile app (e-commerce portal for eyewear in India) where after scanning their face, respondents could try the different frames of spectacles and sunglasses to see which one best suits them. To assess the research model for reliability and validity, confirmatory factor analysis was used. Structural equation modelling was used to test the said impact. Results demonstrate that the effective use of augmented reality has a significant impact on the creation of sensory brand experiences and the intent to use the mobile app using the AR feature. Thus, the paper helps in establishing how a mobile app with an integrated AR app becomes an important touchpoint with the consumer in the digital era.

Keywords: Augmented Reality, Perceived Ease of Use, Perceived Usefulness, Perceived Enjoyment, Flow Experience, Intention to Use, Sensory Brand Experience

INTRODUCTION

There has been an increasing use of digital interactive technologies to develop consumer experiences in online settings. Digital technologies have the potential to improve the online experience by making it more engaging, informative, and entertaining (Petit et al., 2018). The growth of smartphones and mobile applications integrated with augmented reality (AR) technology has made it possible for firms to deliver their products and services with experiential benefits to the users. Customers may be exposed to multiple stimuli to create sensory brand experiences, which in turn, helps to solidify brand personality and thus, influence customer's brand loyalty and preference (Brakus, et al., 2009; Maymand, et al., 2012).

The widespread acceptance of AR for product marketing remains uncertain (Davis, 2019). Our study seeks to assess the effectiveness of augmented reality (through a 3-D product try-on) in creating sensory brand experience and intention to use the mobile app with the integrated AR feature. The study makes an important contribution as it integrates the flow theory in identifying an important component, that is, flow experience, while designing the mobile app with an integrated AR feature. This study also identifies the utilitarian benefits (perceived ease of use and perceived usefulness) and hedonic benefits (perceived enjoyment and flow experience), following the Technology Acceptance Model (Davis, 1986) and Uses and Gratifications Theory taking cues from (Rauschnabel, et al., 2018) to determine the factors that need to be considered while integrating AR feature in a mobile app, that will lead to the customer's intention to use the mobile app. Also, 'customer experience' is the new buzzword. It

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is said that businesses which understand themselves in terms of their customers' expectations and desires, and incorporate new ideas based on data and technologies to improve the consumer experience, will be the ones that will succeed Shift Event (Whitepaper, 2019). Thus, the study also investigates the effectiveness of an AR feature integrated in a mobile app to produce sensory brand experiences for the customers. Research in these areas can help the marketing managers to design their digital strategies, specifically to design their mobile apps as an important touchpoint in reaching out to the customers.

Specifically, the study seeks to answer the following research questions.

RQ1: Does an AR feature integrated in a mobile app impact the intention to use the app?
RQ2: Is an AR based mobile app effective in creating sensory brand experience for the customers?
RQ3: What moderating role does sensory brand experience has on intention to use the app?
RQ4: What influence do perceived usefulness (PU), perceived ease of use (PEOU), perceived enjoyment (PE) and flow experience (FE) have on creating sensory brand experience and the intention to use the mobile app?

The remainder of the paper is divided into the following sections. The second section provides a summary of the literature. In section three, hypotheses are developed and a research model is presented. The fourth section contains an outline of research methodology. The findings are presented in section five and discussed in the following section, along with presenting implications for managers and directions for future research.

LITERATURE REVIEW

Augmented Reality

Augmented reality is a digital technology that is interactive in nature and entails layering of digital information over the actual world in both space and time (Craig, 2013). Unlike virtual reality (VR), users of augmented reality (AR) are not cut off from the natural world; they can still see their surroundings, but the device augments them with virtual data (Han & tom Dieck, 2019; Dwivedi, et al., 2020; Han, et al., 2020). Several research studies have shown that AR is correlated with a variety of favourable consequences for customers and businesses. AR technology converts into an assortment of significant results like positive experiences (Han, et al, 2019), engagement (Olya, et al., 2020) and purchase intentions (Dacko, 2017). Brands can now offer virtual reality services to consumers *via* mobile applications (Dacko, 2017) and enhance the customer experience (McLean & Wilson, 2019), thanks to the growing adoption of smartphones.

Sensory Brand Experience

Because of their power to generate links with products through sensory, emotive, intellectual, and physical cues, experiences have been recognised as a vital component of strategic brand placement in the minds of customers (Schmitt, 1999; Brakus, et al., 2009). Today's marketers seek to create experiences that combine physical, virtual, and fantasy elements. L'Oréal has introduced AR to enable customers to digitally put on make-up and hair colours before purchasing, and Ikea uses AR to help customers visualise how various furniture items would look in their homes. Despite the fact that technical advancements like these have transformed the retail environment for consumers, there is currently a dearth of study on AR's ability to create a state of flow in shopping interactions and if a state of flow induced by AR would improve customer outcomes. Creating positive client experiences has been linked to

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repeat sales (Dick & Basu, 1994), as well as sustained success (Schmitt, 1999). Thus, creating experiences for the customers by using AR should be of value to the marketers.

Technology Acceptance Model (TAM)

Davis (1986, 1989) developed the Technology Acceptance Model (TAM), which is one of the most widely used models for analysing customer acceptance of technologies. The model reflects on 'perceived usefulness' and 'perceived ease of use' as being the two most important considerations influencing a person's decision to use a technology. Perceived Usefulness (PU) refers to the user's expectation that the technology can help him or her work better, while Perceived Ease of Use (PEOU) refers to the user's belief that using the technology will be free of effort (Davis, 1989). Consumers' use of technology has been linked to perceived ease of use (McLean, 2018) and perceived usefulness (Davis, 1989, Kim, et al., 2017).

In the extended TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008) models, perceived enjoyment and subjective norm in technology were investigated. According to Venkatesh, et al., (2012), Perceived Enjoyment (PE) is described as the practice of using a particular system that is enjoyable regardless of any performance consequences that may arise from system use. The existing literature shows that enjoyment can affect computer use (Davis et al., 1992), internet use (Venkatesh et al., 2012), and mobile app use (Hsiao et al., 2016), among other things. As a result, perceived enjoyment has emerged as a key factor in determining how modern technology is adopted and used.

Uses and Gratifications Theory

From a Uses & Gratifications theory viewpoint, Javornik (2016a,b) conceptualises the potential of AR in creating an integrated flow experience. The definition of flow was introduced by Csikszentmihalyi (1975) as a state of holistic feeling experienced by people when they act with complete involvement. When one is in a state of flow, they are fully absorbed and inspired to complete a task. When users reach a level of concentration so intense that they are fully immersed in a task, they are said to be experiencing flow experience (Csikszentmihalyi, 1990). Because of the possible cognitive and hedonic benefits, marketers are concerned about consumers' ability to experience a state of flow. However, there is a paucity of studies on the degree to which customers achieve a state of flow during AR shopping experiences. An application of the Uses and Gratifications theory also helped in identifying the possible utilitarian and hedonic effects of AR (Rauschnabel et al., 2018).

HYPOTHESES AND RESEARCH MODEL

The theoretical framework of the model and formulation of hypotheses have been designed based on the Technology Acceptance Model (TAM) and Use and Gratifications Theory. According to TAM and TAM3, Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Perceived Enjoyment (PE) influence the attitude towards a technology, which further influences the customer's intention to use the said technology. Also, from a Uses & Gratifications theory viewpoint, Javornik (2016 a,b) conceptualises the potential of AR in creating an integrated Flow Experience (FE). Thus, in our study, we consider PEOU, PU, PE and FE to define effective use of AR in a mobile app. We then find the impact of an AR feature integrated in a mobile app on sensory brand experience and intention to use the app.

Perceived Ease of Use

According to Stern, et al., (2008), Perceived Ease of Use (PEOU) is essentially the user's assessment of the ease at which the technology may be applied to a specific task. As a

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result, it influences people's attitudes toward technology and their perceptions of its usefulness (Donmez-Turan & Kir, 2019). Kim & Forsythe (2008) found a connection between perceived ease of use and online shopping experience. Users are more likely to embrace augmented reality because of its functional benefits. According to Davis (1989), there is a connection between perceived ease of use and system use. Thus, we propose the following hypothesis:

H1a: Perceived Ease of Use has a significant impact on the intention to use the mobile app with integrated AR feature.

Perceived Usefulness

According to Stern, et al., (2008), Perceived Usefulness (PU) refers to "the user's evaluation of the usefulness of the technology." According to Kim & Forsythe, (2008), perceived usefulness has a significant impact on the desire to use Virtual Try-on Technology for online shopping. The same argument is made by Disztinger, et al., (2017) in which TAM was adapted for Virtual Reality and travel planning, confirming a connection between perceived usefulness and behavioural intention. Additionally, the impact of PU on intention to continue using a technology has been demonstrated for a variety of online technologies (Susanto et al., 2016). In light of these arguments, we propose the following hypothesis:

H1b: Perceived Usefulness has a significant impact on the intention to use the mobile app with integrated AR feature.

Perceived Enjoyment

Research by Disztinger, et al., (2017) on virtual reality and travel planning found that perceived enjoyment is a "good predictor" of behavioural intention. According to Olsson, et al., (2013). AR applications can have a fun and engaging experience. When consumers felt the mobile augmented reality app was fun, useful, and added to information acquisition, they were more likely to have a positive affective response (McLean & Wilson, 2019; Qin, et al., 2021). Kim & Forsythe (2008), reflects that hedonic elements of online shopping has a significant impact on the decision to use virtual try-on technology for online shopping. Based on these arguments, it is expected that

H1c: Perceived Enjoyment has a significant impact on the intention to use the mobile app with integrated AR feature.

Flow Experience

Users are said to be experiencing flow experience when they are fully immersed and motivated to accomplish a task (Csikszentmihalyi, 1990). In the case of online technologies, some studies have established that flow experience has a direct impact on intention to use (Liu, 2017; Lee & Kim, 2017). In our study, we anticipated that consumers of mobile applications can reach a flow state when performing the app's recommended activity. Users will focus in a flow state and experience pleasure and profound satisfaction. As a result, in the case of a mobile app having an integrated AR feature, it is expected that:

H1d: Flow Experience has a significant impact on the intention to use the mobile app with integrated AR feature

AR and Intention to Use the Mobile App with Integrated AR Feature

Drawing from TAM and Uses and Gratifications theory, we assume in our study that effective use of AR in a mobile app is defined by PU, PEOU, PE and FE. We aim to assess

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whether the use of AR in a mobile app will have a significant impact on intention to use the mobile app when these factors are carefully brought together to design the mobile app with the integrated app. These factors can individually impact the intention to use the mobile app (as explained in the arguments drawn above), however, we want to test their combined impact on the intention to use the mobile app. Thus, we hypothesize that effective use of AR in a mobile app (a construct defined by the factors PEOU, PU, PE and FE) will have a significant impact on intention to use the mobile app with the integrated AR feature.

H1: Effective use of AR in mobile apps has a significant impact on the intention to use the mobile app with integrated AR feature

AR and Sensory Brand Experience

Visual enabling technologies can enhance web atmospheres (Javornik, 2016a,b) and induce a sense of immersion (or telepresence), separating people from their physical surroundings and engulfing them in their virtual world (Yim et al., 2017). The multi-sensory AR application enhances the sensory control (*i.e.*, sight, touch and voice) and feedback which gives a clear mental imagery of the product or service being offered, thereby paving way for comfort in decision making and enhancing the overall consumer experience (Heller et al., 2019). Since AR has the capability of activating the sensory abilities and experiences for the consumer, we propose the following hypothesis.

H2: Effective use of AR in mobile apps has a significant impact on sensory brand experience
Also, since we define effective use of AR in a mobile app as a construct defined by the factors PEOU, PU, PE and FE, we also assume that all these factors will have a significant impact on creation of sensory brand experience through the integrated AR feature of the mobile app. Thus,
H2a: Perceived ease of use of the AR feature in a mobile app has a significant impact on sensory brand experience
H2b: Perceived usefulness of the AR feature in a mobile app has a significant impact on sensory brand experience
H2c: Perceived enjoyment of the AR feature in a mobile app has a significant impact on sensory brand experience
H2d: Flow experience of the AR feature in a mobile app has a significant impact on sensory brand experience

Sensory Brand Experience as the Mediating Variable between Effective Use of AR and Intention to Use

AR expands the individual's real-world experience by combining the same with some external content (Yim & Park, 2019). In the e-commerce world, AR can be used to design highly engaging and immersive environments to offer more exciting and greater shopping experiences, (Javornik, 2016a,b; Hilken et al., 2018) which, in turn, result in customer satisfaction and purchase intention (Poushneh & Vasquez-Parraga, 2017). Based on this argument, we test sensory brand experience as a mediating variable in our study and lay down the following hypothesis.

H3: Sensory brand experience mediates the relationship between effective use of AR and intention to use the mobile app with an integrated AR feature.

Utilitarian and Hedonic Benefits of Mobile App with an Integrated AR Feature

Online product presentations through a mobile app with an integrated AR feature provides utilitarian and hedonic benefits to a consumer/user (Huang & Liao, 2015; Hilken, et al., 2017).

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Perceived Usefulness (PU) is described as the user's assessment of the technology's usefulness (Stern et al., 2008). According to Stern, et al., (2008), Perceived Ease of Use (PEOU) is the user's evaluation of the technology's ease of use to a specific task. According to Kim & Forsythe (2008), perceived ease of use and online shopping experience are related. Because of its functional advantages, users are more likely to adopt augmented reality. Thus, we consider PEOU and PU as the utilitarian benefits associated with using a mobile app with an AR feature. Moreover, virtual and augmented reality's potentially enjoyable experience was found to have a positive effect on both buying intentions and willingness to pay (Poushneh & VasquezParraga, 2017). Moreover, flow, immersion, and engagement have shown to improve emotional experience and, as a result, a more engaged and fun experience (Kim & Forsythe, 2008; Yim, et al., 2017). Thus, we consider PE and FE as the hedonic benefits associated with using a mobile app with an AR feature

Based on the aforesaid arguments, theories and hypotheses, we develop the following research model for our study (Figure 1).

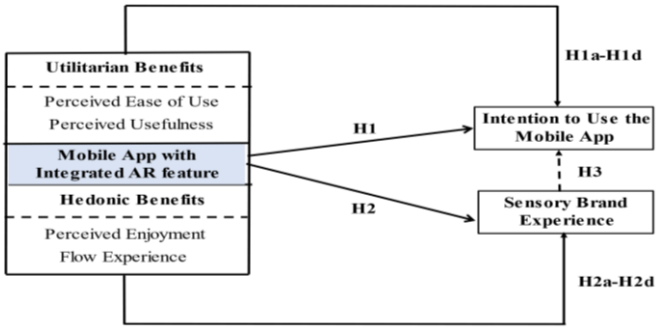

FIGURE 1
CONCEPTUAL FRAMEWORK FOR THE STUDY

RESEARCH METHODOLOGY

Survey Instrument

Respondents were asked to fill a questionnaire. The respondents were made to use the virtual feature on the Lenskart app (on the mobile phone) where they could try the various frames of spectacles and sunglasses after scanning their face, to see which one suits them better (Figure 2 and Figure 3). After this exercise, they proceeded to fill the questionnaire. Beside from demographic data, the questionnaire includes questions on the model's constructs – 'effective use of AR in a mobile app'- (measured using 'perceived ease of use', 'perceived usefulness', 'perceived enjoyment' and 'flow experience'), 'sensory brand experience' and 'purchase intention'. There were 20 questions in this part of the questionnaire and these were evaluated on a seven-point Likert scale ranging from 1: "Strongly Disagree" to 7: "Strongly Agree" (Table 1).

FIGURE 2
VIRTUAL TRY-ON FEATURE ON LENSKART MOBILE APP

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FIGURE 3
FACE SCANNING AND TRYING OF SPECTACLES USING THE AR FEATURE ON LENSKART MOBILE APP

Table 1
CONSTRUCTS AND MEASUREMENT ITEMS

Constructs (references)	Item ID	Item
Perceived Ease of Use (Adapted from Davis, 1989)	PEOU1	1. Learning to operate the mobile app with AR feature was easy for me.
	PEOU2	2. Overall, I find this app to be user friendly.
	PEOU3	3. My interaction with the AR feature on the app is clear and understandable
	PEOU4	4. The mobile app is complicated and not easy to use. (reverse coded)
Perceived Usefulness (Adapted from Davis, 1989)	PU1	1. Using the mobile app with AR technology would be useful in increasing my knowledge about the brand and providing information about the products and services being offered.
	PU2	2. Using the AR feature on the app enhanced my shopping experience by giving a more personalized experience.
	PU3	3. This technology will make purchasing the offering of the marketers more comfortable and convenient.
	PU4	4. This technology helped me in making satisfied purchase decisions.
Perceived Enjoyment (Adapted from McLean and Wilson, 2019; Yi & Hwang, 2003)	PE1	1. I find the overall experience of using the mobile app with AR technology to be enjoyable and pleasant.
	PE2	2. I have fun using this mobile app.
	PE3	3. Selecting a spectacles using this app is interesting.
Flow experience (Adapted from Yim et al., 2017, Yan et al., 2021)	FE1	1. I was deeply engrossed.
	FE2	2. My attention was focused entirely on what I was doing.
	FE3	3. I enjoyed the feeling of that performance and want to capture it again.
Sensory Brand Experience (Adapted from Brakus et al., 2009)	SBE1	1. I find AR try-on with this app interesting in a sensory way.
	SBE2	2. This AR try-on with this app makes a strong impression on my visual senses.
	SBE3	3. The AR try-on with this app does not appeal to my senses. (reverse coded)
Intention to Use (Adapted from Pantano et al., 2017)	ITU1	1. Assuming that I have access to a smart device, I will download the mobile app with AR feature.
	ITU2	2. Given that I have access to the mobile app with AR technology, I will use it.
	ITU3	3. I will recommend such an app to my friends, family, and relatives.

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Sampling Design and Sample Size

The respondents of the study were chosen following judgmental sampling (a non-probability sampling method used in the absence of a defined population for the required respondent set). The sample consisted of 168 respondents from a metropolitan city of India with the help of personally administered questionnaires after the respondents tried the AR feature of the Lenskart app. The demographic data of respondents is given in Table 2.

Table 2
DEMOGRAPHIC PROFILE OF RESPONDENTS

Variable	Category	Frequency	Percent
Gender	Male	73	43.45
	Female	95	56.55
Age (years)	18-25	51	30.36
	26-35	63	37.50
	35-45	36	21.43
	45-55	11	6.54
	Above 55	7	4.17
Education	Undergraduates	62	36.90
	Graduates	52	30.95
	Postgraduates	41	24.41
	Doctorates	13	7.74

Research Techniques

Confirmatory factor analysis was used to test the research model for reliability and validity. Thereafter, structural equation modelling was used to assess the impact of an integrated AR feature in a mobile app on creating sensory brand experience and on the intention to use the mobile app.

RESULTS

The data was analysed using a variety of validated instruments and procedures.

Sampling Adequacy Test

The KMO (Kaiser-Meyer-Olkin) statistic was calculated and it revealed a value of 0.856, which is considered as ‘marvellous’ (Kaiser, 1974). Bartlett’s test results reveal a chi-square value of 2536.616 (df=190, Sig.=0.000). This value is significant and thus, acceptable. EFA was carried out and the total variance explained was 80.637%, which is well-above the required value of 50%.

Descriptive Statistics of Factor Items

Table 3 gives a descriptive statistics of factor items. These were measured on a 7-point Likert scale. Hence, the maximum mean score for each factor can be 7. As can be seen from Table 3, that all the factor items were rated very high by the respondents (as revealed by the mean scores where all scores are above 5.7). This implies that the mobile app with an integrated

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AR feature in question was rated high in terms of perceived ease of use, perceived usefulness, perceived enjoyment and flow experience.

Table 3
DESCRIPTIVE STATISTICS OF FACTOR ITEMS

Factor	Factor Item	N	Minimum	Maximum	Mean	Standard Deviation
Perceived Ease of Use	PEOU1	168	3	7	6.14	0.668
	PEOU2	168	3	7	5.83	0.766
	PEOU3	168	2	7	5.93	0.786
	PEOU4	168	2	7	5.76	0.754
Perceived Usefulness	PU1	168	4	7	5.79	0.655
	PU2	168	5	7	5.92	0.613
	PU3	168	5	7	5.88	0.617
	PU4	168	5	7	6.15	0.606
Perceived Enjoyment	PE1	168	4	7	5.79	0.693
	PE2	168	5	7	6.16	0.622
	PE3	168	3	7	6.03	0.696
Flow Experience	FE1	168	4	7	5.81	0.638
	FE2	168	5	7	5.83	0.576
	FE3	168	5	7	5.80	0.528

Measurement Model Evaluation

Item loadings, Composite Reliability (CR), and average variance extracted were used to test the measurement model for convergent validity (AVE). To determine the reliability of each construct, we first obtained factor loadings and then evaluated Composite Reliability (CR), AVE, and Cronbach's alpha (>0.7, Nunnally, 1978). All item standardised loadings surpass the suggested value as shown in Table 4. Additionally, the three conditions to determine convergent validity of a construct were also met whereby, Cronbach Alpha (α)>0.7, Average Variance Extracted (AVE)>0.5, and Cronbach Alpha (α)>AVE, thus, demonstrating satisfactory internal consistency (Hair, et al., 2010).

Table 4
CONVERGENT VALIDITY AND RELIABILITY OF CONSTRUCTS

Constructs	Items	Factor Loadings	Cronbach Alpha (α)	AVE	Composite Reliability (CR)
Perceived Ease of Use (PEOU)	PEOU1 PEOU2 PEOU3 PEOU4	0.772 0.835 0.835 0.830	0.914	0.756	0.925
Perceived Usefulness (PU)	PU1 PU2 PU3 PU4	0.836 0.873 0.863 0.591	0.936	0.771	0.936
Perceived Enjoyment (PE)	PE1 PE2 PE3	0.808 0.769 0.876	0.838	0.646	0.851
Flow Experience (FE)	FE1 FE2 FE3	0.816 0.883 0.884	0.869	0.698	0.876
Sensory Brand Experience (SBE)	SBE1 SBE2 SBE3	0.847 0.711 0.896	0.822	0.678	0.875
Intention to Use (ITU)	ITU1 ITU2 ITU3	0.768 0.843 0.817	0.778	0.592	0.814

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Next, we tested the model for discriminant validity. Establishing discriminant validity requires that AVE>MSV and AVE>ASV (Hair et al., 2010). Also, Fornell & Larcker (1981) suggest comparing each factor's AVE score to the squared-correlation shared by all other constructs, claiming that if the AVE is higher in all instances, the construct has discriminant validity. As can be seen from Table 5, this was confirmed.

Table 5
DISCRIMINANT VALIDITY

Constructs	AVE	MSV	ASV	SBE	PU	PEOU	PE	FE	ITU
SBE	0.708	0.275	0.146	0.842					
PU	0.787	0.382	0.179	0.272	0.887				
PEOU	0.754	0.382	0.192	0.351	0.618	0.869			
PE	0.658	0.289	0.124	0.289	0.538	0.419	0.811		
FE	0.703	0.174	0.098	0.417	0.241	0.377	0.262	0.838	
ITU	0.593	0.275	0.110	0.524	0.305	0.369	0.056	0.212	0.770

Structural Model Evaluation

The impact of using AR in a mobile app (independent variable) on the dependent variables – intention to use and creation of sensory brand experiences – was investigated using Structural Equation Modelling (Figure 4). The standardised beta coefficients were computed as 0.45 and 0.47 respectively, and both are statistically significant at the 95% confidence mark (Table 6). Thus, our findings support both the hypotheses – H1 and H2 (Table 7). Table 6 also shows the goodness of fit values for our research model, which are all well within the acceptable limits. The impact of various utilitarian and hedonic benefits of AR feature in a mobile app (PEOU, PU, PE and FE) was also found on intention to use and sensory brand experience and results are given in Table 7.

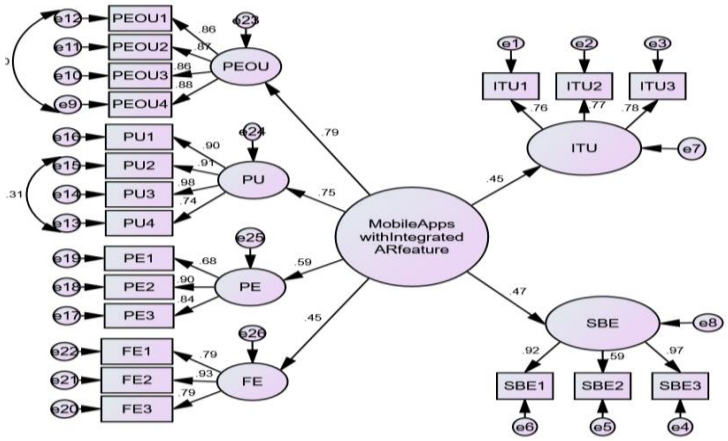

FIGURE 4
IMPACT OF AR FEATURE IN A MOBILE APP ON SENSORY BRAND EXPERIENCE AND INTENTION TO USE THE MOBILE APP

Table 6
PATH ANALYSIS RESULTS

Model Element	Impact of AR feature on intention to use the mobile app	Impact of AR feature on sensory brand experience
Standardised Beta (r)	0.45 (***)	0.47 (***)
Model Fit		
	Observed Values	Recommended Values
CMIN/DF (λ^2/df)	1.996	<3 (Hair et al., 2010)

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GFI	0.848	>0.8 (Baumgarther and Homburg, 1996)
AGFI	0.803	>0.8 (Baumgarther and Homburg, 1996)
CFI	0.935	>0.9 (Hair et al., 2010)
RMSEA	0.077	0.5 - 0.10 (Hair et al., 2010)
*** significant at 95 percent confidence level		

Mediation Analysis

To test whether the influence of AR on ITU is mediated by SBE, we utilized the bootstrapping method with findings presented in Table 7. Bootstrapping method helped in determining statistical significance of the path coefficients in the model. In our study, the indirect effect was significant, with standardized indirect effect=0.187 ($p<0.05$), thus, mediation is present (Hair, et al., 2011). Also, since the relationship between AR and ITU becomes insignificant in the presence of SBE ($\beta=0.20$, $p>0.05$), thus, we conclude that this is a case of full mediation.

Table 7
SUMMARY OF RESULTS

Hypothesis	Relationship	Path Coefficient	p value	Supported?
H1	AR → ITU	0.45 (***)	<0.05	Yes
H2	AR →SBE	0.47 (***)	<0.05	Yes
H1a	PEOU → ITU	0.36 (***)	<0.05	Yes
H1b	PU → ITU	0.30 (***)	<0.05	Yes
H1c	PE → ITU	0.05 (ns)	p>0.05	No
H1d	FE → ITU	0.21 (***)	<0.05	Yes
H2a	PEOU → SBE	0.33 (***)	<0.05	Yes
H2b	PU → SBE	0.25 (***)	<0.05	Yes
H2c	PE → SBE	0.27 (***)	<0.05	Yes
H2d	FE → SBE	0.40 (***)	<0.05	Yes
H3	AR → SBE→ ITU	0.20 (ns)	p>0.05	Yes (Full Mediation)

Note: AR=Augmented Reality, ITU=Intention to Use, SBE=Sensory Brand Experience, PEOU=Perceived Ease of Use, PU=Perceived Usefulness, PE=Perceived Enjoyment, FE=Flow Experience
*** *significant at 95 percent confidence level,* ns=not significant

Path analysis was done to examine the significance of other hypotheses. Regarding the various constructs considered in building an effective AR feature in a mobile app, the results illustrated that PEOU ($\beta=0.36$, $p<0.05$), PU ($\beta=0.30$, $p<0.05$) and FE ($\beta=0.21$, $p<0.05$) showed a positive correlation and a significant impact on intention to use the mobile app, while PE ($\beta=0.05$, $p>0.05$) was not significant (Table 7). Thus, H1a, H1b and H1d were all supported, however, H1c was rejected.

When we consider the impact of effective use of AR in a mobile app on sensory brand experience, the results illustrated that PEOU ($\beta=0.33$, $p<0.05$), PU ($\beta=0.25$, $p<0.05$), PE ($\beta=0.27$, $p<0.05$) and FE ($\beta=0.40$, $p<0.05$) showed a positive correlation and a significant impact on creation of sensory brand experiences (Table 7). Thus, H2a, H2b, H2c and H2d were all supported.

Also, since the relationship between AR and ITU becomes insignificant in the presence of SBE ($\beta=0.20$, $p>0.05$), thus, we conclude that this is a case of full mediation. Thus, H3 is supported.

DISCUSSION

Digital interactive technologies are constantly being used to produce consumer interactions in online environments. The aim of this study is to see how effective augmented

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reality (*via* a 3-D product try-on) is at generating a sensory brand experience and a desire to use the smartphone app with the AR feature.

For our study, TAM was adapted to define the effective use of AR in a mobile app. Our data confirms the relationship between PEOU and intention to use (ITU) and PU and ITU. Interestingly, our results are in line with Susanto, et al., (2016); Disztinger, et al., (2017); Donmez-Turan & Kir (2019), who concluded that PEOU and PU significantly impact behavioural intention of consumers. When we tested Perceived Enjoyment (PE) as a significant predictor of intention to use (ITU), we found that PE does not significantly impact ITU a mobile app with an AR feature (in contrast to the earlier studies by Venkatesh, et al., (2012); Disztinger, et al., (2017); McLean & Wilson (2019); Qin, et al., (2021). Also, applying Users and Gratifications theory, we tested the impact that Flow Experience (FE) has on ITU and found a significant relationship between the two. These findings support those of Liu (2017), Lee & Kim, (2017); Yan, et al., (2021) who found that flow experience has a direct effect on intention to use online technology.

Not only this, a mobile app using the AR feature, built collectively on the vital components of PU, PEOU, PE and FE also significantly affects the intention to use the mobile app (β=0.45) and sensory brand experience (β=0.47) which is moderate and thus, testifies as to how these components emerge as important dimensions while designing a mobile app with an in-built AR feature. This clearly establishes that both utilitarian and hedonic benefits have to be built in a mobile app using an AR feature to build the intention to use by the consumer.

Also it should be noted from Table 3 that the mean score of each of the utilitarian and hedonic components of the AR feature of the mobile app is high (more than 5.7 out of 7 for all the item components of the factors PEOU, PU, PE and FE). In case this scoring is low, the AR feature of the mobile app may not bring forth the desirable results, namely, intention to use the app and creating sensory brand experiences.

Finally, we found that sensory brand experiences created through an AR based mobile app fully mediates the relationship between the effective use of AR and intention to use the mobile app using this AR feature. This result is consistent with the study by Poushneh & Vasquez-Parraga (2017), which established that AR has a significant effect on consumer experiences and this affects willingness to buy.

Implications for Managers

Thanks to mobile computing technologies, augmented reality (AR) is gaining traction as a user interface for digital marketing innovations that seamlessly mix immersive digital information with a person's view of the physical environment (Porter & Heppelmann, 2017). It is important for a marketer to explore the possibilities of using mobile apps with in-built AR feature as a new customer touchpoint.

By studying the specific AR constructs (PEOU, PU, PE and FE) and with statistical evidence on their effectiveness, marketers can take advantage of AR as a means to improve their product and service experience in the virtual world (Hilken et al., 2017). Moreover, our study contends that a mobile app using an integrated AR feature should be able to provide both utilitarian benefits (perceived ease of use and perceived usefulness) and hedonic benefits (perceived usefulness and flow experience) to be able to create sensory brand experiences and intention to use the mobile app. These provide important information cues to a marketer while designing a mobile app intended to bring forth the said benefits.

Furthermore, in the light of COVID-19, since the term ‘contactless’ has emerged as a key buzzword for ensuring safety and hygiene, the pace of digital transformation in organisations has accelerated. Even in developed countries, an increasing number of businesses are considering incorporating augmented reality and virtual reality into their marketing strategies. In fact, the brand ‘Lenskart’ considered for our study was able to able to ensure a safe way of product selection and purchase through the AR feature of their mobile app while the

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consumers faced the conditions of quarantine and partial/full lockdown in India. As consumers become more receptive to the adoption of digital technologies, accelerated due to covid situation, this seems to be right time for marketers to invest in their digital capabilities and upscale their digital game for providing meaningful experiences to the consumers and assisting them in the various stages of their consumer purchase journey – shortlisting of a product, collecting information on it, evaluating various alternatives, final selection of the product and purchase. As in all these stages, the utilitarian and hedonic benefits of the mobile app shall remain important while using the mobile platform. Also, the mobile apps with the latest technology needs to be designed carefully, in a way that it scores high on various parameters discussed in this study. In the long run, mobile AR apps can create a customer-brand relationship, which inspires mobile marketers to think about long-term and sustained forms of customer interaction through mobile devices (Scholz & Duffy, 2018).

Directions for Future Research

The study's limitations could pave the way for future studies. We based our study on the AR experience of the Lenskart mobile app, an e-commerce platform for eyewear in India. Because of the current nature of eyewear shopping, we choose this particular AR experience and industry. Researchers may perform a comparable study for products in different industries and mobile apps using other types of AR features to see whether similar findings could be obtained.

The results hold good in case of a product like sunglasses and spectacles. Future research needs to be conducted at varying levels of product involvement. For instance, companies manufacturing automobiles and those selling apartments are also making use of the virtual technology to create customer experiences. But would an effective use of virtual technology generate a significant impact on creating sensory experiences and purchase intention for these categories of products also?

Also, the majority of respondents were between the ages of 18 and 45, according to the demographic profile of respondents. A different sample of older consumers may produce different results, as they may be more hesitant or uncomfortable with the mobile app's AR functionality. Future research can study the older age group sample to study the technology adoption, technology anxiety as additional factors which determine the intention to use mobile app with an in-built AR feature. Studies can aim to find out who are the early adopters of a mobile app using an AR feature.

Concerns about privacy are becoming increasingly important in influencing consumer intent to usage behaviour, especially in the context of technology-based product or service offerings. In this context, it is important to study the impact of privacy issues, especially those in case of AR feature because they would scan a person's physical body (face, hands etc.) or a part of his/her surroundings (home, office, etc.).

The Covid-19 pandemic had a major impact on shopping, leisure and work practices, causing many people to change their buying behaviour. Due to conditions of partial/complete lockdown and increasing concern for safety and sanitation measures, many people have taken to online shopping. As a result, the number of downloads of various smartphone applications has increased dramatically. In the future, mobile apps will play a bigger role in consumer purchases of various products. Future research should look at how the Covid-19 pandemic influenced users' adoption and use of mobile apps, especially those with an AR feature for product selection, as well as the long-term implications of the same.

CONCLUSION

With the tremendous growth of digital technologies and digital platforms, it can be expected that mobile apps using AR feature will be more prominent in the days to come. This makes it important for the marketers to explore a mobile app with an AR feature as an additional

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touchpoint with the consumers. Research in the area will help in understanding consumer behaviour in the context of digital platforms and products sold *via* the same. Also, it would remain important for marketers to design meaningful experiences for consumers along with providing the much needed information to consumers about their products. Our study reveals that a mobile app with an AR feature needs to carefully incorporate utilitarian benefits (perceived ease of use and perceived usefulness) as well as hedonic benefits (perceived enjoyment and flow experience) for the consumers. This will not only create sensory brand experiences but also impact the intention to use this mobile app by the consumers.

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