

Augmented reality is the new digital banking – AR brand experience impact on brand loyalty

## **Abstract**

**Purpose** – Consumers are engaging with novel technologies to have better experiences. The current study investigates the banking consumer brand experience from the perspective of augmented reality (AR). Mobile augmented reality applications in financial institutions provide a pleasurable and immersive experience. The study highlights the use of the mobile augmented reality (MAR) applications by a bank in Pakistan and its impact on consumer loyalty and continuous intention keeping in view the AR brand experience.

**Design/Methodology/approach** – We conducted a comparative study between married and unmarried consumers with sample sizes of 178 and 172, respectively. The results were analysed through structural equation modelling using *Smart -PLS*.

**Findings** – The study's outcomes show that AR brand experience for the unmarried sample category is positive and higher than a married one. This is an excellent opportunity for the banking sector in Pakistan to invest more in innovative technologies.

**Originality/Value** – The current study investigates the brand experience in the banking sector from the perspective of AR technology which contributes to the AR literature.

**Keywords:** Sensory AR experience, affective AR experience, intellectual AR experience, behavioural AR experience, AR satisfaction, AR enjoyment, MAR apps continuous intention, brand loyalty, technology anxiety.

**Paper type:** Research paper

## Introduction

The digital transformation in the banking sector, such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR), has pervasively changed the consumer usage of banking services (Tekic and Koroteev, 2019; Verhoef *et al.*, 2021). Recently, it has been reported in UK more than 78% of financial customers would be using AR based services in the next ten years.. Augmented reality and virtual reality are becoming increasingly popular in the financial sector (Calpo 2004). Moreover, artificial intelligence has improved at least 11% banking experience in emerging economy of India (Kuswaha *et al.*, 2021). The industries such as entertainment, shopping, advertising, tourism, education, and banking continuously engage with novel technologies such as mobile augmented reality applications (Hilken *et al.*, 2018; Asad Butt *et al.*, 2021a; Petit *et al.*, 2022). AR-based services increase brand performance and consumer shopping experience (Hinsch *et al.*, 2020). AR-based services are estimated to add up to \$72.8 billion globally by 2024 (Ahmad *et al.*, 2022). AR technology innovates the consumer's shopping experience due to its persuasive and interactive features (Rajaobelina *et al.*, 2018; Caboni and Hagberg, 2019). Fintech is a phenomenon used in banking to enhance consumer services, including AI, VR, or AR (Belanche *et al.*, 2019; Nguyen *et al.*, 2022). AR can help consumers make digital payments, get more information about the product services, get discounts and promotions, virtual try-on, and immersive experiences (Poushneh, 2018; Tan *et al.*, 2022). Many brands have introduced AR apps with AI to engage with their customers at a new level (Chiu *et al.*, 2021; Oyman *et al.*, 2022). AR is an innovative technology revolutionising consumer behaviour (Chylinski *et al.*, 2020). Likewise, the pandemic effect also globally transformed banking services into more of a digital phenomenon (Salas-Vallina *et al.*, 2020).

Previous studies have predicted that mobile augmented reality apps (MAP) are a good source of benefits in the online context (Chen *et al.*, 2021; Qin *et al.*, 2021). AR technology can help brands to grow and achieve their goals because of its immersive experience even in developing countries (Alha *et al.*, 2019; Song *et al.*, 2019). It will be exciting to see the consumer behaviour results in the context of a developing country like Pakistan where technology plays an important role customer satisfaction in banking sector. Many banks in Pakistan have opted for digital apps, and very few focus on AI and AR. One of the known bank in Pakistan has launched

a digital app that focuses on using AR. Thus, the current framework will highlight the usage impact of the AR in the bank's digital app and how it reflects upon the consumer behaviour. Banks have introduced chatbots or robo-advisors, or AI digital apps to engage with their customers and provide a good experience (Mistry, 2018; Rosman, 2018). The brand experience will also provide critical insights into AR technology in the banking sector. The consumer experience matters in the buying process, and the brands that offer entertaining and compelling experiences impact consumer purchase behaviour (Rajaobelina, 2018; Rahardja *et al.*, 2021). In the crux, AR technology would positively impact the lives of Pakistani consumers in the banking sector of Pakistan. Moreover, Calpo (2004) suggested that marital differences play a significant role in determining consumer behavior in banking sector of USA. We look at the developing country demographics with a view to determining consumer behaviour in the banking industry. Furthermore, there is a lack of research on AR technology usage in banking sector of developing countries. It is true for Pakistan as well which is at the emerging stage of using AR technologies in financial services (Kazmi *et al.*, 2021).

Consumers do not purchase a product but purchase a whole experience provided by the service provider (Vlačić *et al.*, 2021). The atmospheric environment created by the brand that stimuli consumer behaviour in the form of emotional, cognitive, and behavioural aspects is called brand experience (Ong *et al.*, 2018). Brand experience has four dimensions that previously predicted positive results on the consumer experience in different industries (Khan *et al.*, 2019; Jaesuk Jung *et al.*, 2021). The sensory, affective, intellectual, and affective experiences are part of the brand experience. These dimensions of brand experience from the AR perspective can provide a better understanding of consumer behaviour. This will be the first of its kind study where AR brand experience is introduced to understand consumer behaviour towards the banking AR digital app. The visual, engaging, intellectual, and behavioural experience in the banking AR digital app can provide valuable insights for the consumer from Pakistan.

Consumers have positive attitudes when they experience a good shopping experience (Moriuchi and Takahashi, 2018; Sina and Kim, 2019). We assume that using AR brand experience will provide a helpful perspective in the banking sector of Pakistan. These brand experiences help the consumer continue using the app or

service and towards brand loyalty (Wenzel and Benkenstein, 2019; Singh and Söderlund, 2020). Here, it is essential to understand that consumer satisfaction will also play a significant role. High satisfaction levels can lead to positive outcomes such as word of mouth, continuous intention, and brand loyalty (Chung *et al.*, 2018; Chung *et al.*, 2020). We assume that the AR brand experience will positively impact AR satisfaction and lead to continuous intention and brand loyalty. Another aspect that becomes important is the entertaining factor of technology. The studies have predicted that AR has functions that can provide enjoyment to consumers (Jang and Park, 2019; Wang *et al.*, 2020; Asad H. Butt *et al.*, 2021b). Hence, joy can positively impact AR satisfaction and the continuous intention of the AR app.

Pakistani consumers are not user-friendly and require time to adopt the technology. Moreover, marketers are not utilizing AR technologies that much (Kazmi *et al.*, 2021). The current framework will try to understand this research gap as to how Pakistani consumers are accepting AR technology. Though the consumer base is growing still, consumers in Pakistan are not tech-savvy, the present study will gain insights from the AR brand experience, AR satisfaction, AR enjoyment, and technology anxiety. An individual may experience nervousness during the use of technology is called technology anxiety (Park *et al.*, 2019). Previous studies have predicted that technology anxiety is a moderator in consumer and brand relationships where technology is involved (Gelbrich and Sattler, 2014; Hyun-Joo Lee and Lyu, 2019). If consumers find it challenging to use a MAR app, they may not adopt the technology (Meuter *et al.*, 2003). As consumers in Pakistan are reluctant to embrace technology, the current framework will provide valuable insights into how Pakistani consumers react and respond to technology in digital banking from the perspective of AR.

## Literature Review and Theoretical Framework Development

The term "augmented reality" (AR) refers to the integration of computer-generated, three-dimensional (3D), simulated objects into objective reality to enable computer-generated entities to coexist with real-world situations and to enhance users' perception of and interaction with their surrounding environment (Chen *et al.*, 2019). This research is based on the user experience model and user gratification theory (Kazmi *et al.*, 2021; Chen *et al.*, 2019). User gratification theory encompasses the

satisfaction of consumers achieved by a specific need. We now present the conceptual framework and hypotheses development.

### *Brand Experience*

The current framework focuses on the brand experience the consumer will engage with using a bank's AR digital app. Theoretically, a brand experience phenomenon was introduced by Brakus *et al.*, 2009 that focuses on brand-related stimuli within the physical and online environment. The consumer-brand relationship explains the idea from the perspective of applied management, brand philosophy, cognitive approach, and marketing. The consumption, shopping, and product experiences within a brand environment institute the overall brand experience (Cleff *et al.*, 2018; Mathew and Thomas, 2018). The relationship between a brand and a consumer is very important because it highlights the behavioural, cognitive, emotional, and social aspects (Schmitt, 2009; Andreini *et al.*, 2019). The current study will try to understand the consumer-brand relationship experience with the use of an AR digital app of a Pakistan-based bank. The present study will be the first to investigate brand-related stimuli through MAR app usage.

Previous studies have explored the brand experience from different industries, such as shopping, e-commerce, and tourism (Barnes *et al.*, 2014; Khan *et al.*, 2016; Klein *et al.*, 2016; Jeremías and Pena, 2021). Experiences take place with time as the consumer's usage of a brand increases. The effect of positive experiences comes with the stimuli the brand associates with its functions and use (Kamath *et al.*, 2019). Therefore, with usage and time, brand experiences can positively impact brand growth and performance (Loureiro and Sarmento, 2018). Thus, it is crucial to understand the physical, cognitive, and emotional aspects that can enhance a consumer's experience while purchasing a product or service. Mobile apps in the banking sector are being integrated with AI. Many studies have been conducted to understand the impact of mobile banking's digital app from the perspective of adoption, behavioural, loyalty, and performance (Ramadan and Aita, 2018; Levy, 2022; Northey *et al.*, 2022). The following sections will cover the four dimensions of brand experience from the perspective of AR.

### *AR brand experience perspective*

AR is a novel technology that can engage, interact and immerse the consumer while purchasing a product or service. It has been investigated in different industries such as gaming, tourism, cosmetics, education, medical, and shopping (Gopalan *et al.*, 2016; Alha *et al.*, 2019; McLean and Wilson, 2019; Timothy Jung *et al.*, 2020; Qin *et al.*, 2021; Ahmad *et al.*, 2022). They are explored from online, physical, and hybrid perspectives to understand consumer experiences with AR technology (Rauschnabel *et al.*, 2019; Nikhashemi *et al.*, 2021). AR technology has also investigated experimental and behavioural studies from online and physical contexts to get more insights into consumer behaviour (Caboni and Hagberg, 2019; Heller *et al.*, 2019). The current study will investigate AR usage with the brand experience from the banking sector in Pakistan. It will be interesting to see how AR works as a functional platform with brand experience dimensions such as sensory, affective, behavioural, and intellectual. Consumers in Pakistan are experiencing innovative technologies such as AI and AR in the banking sector. Still, it requires more study to understand the consumer-brand relationship and the experiences involved in it. Hence, the current framework will explore the AR brand experience of a bank's digital app in Pakistan.

### *Sensory AR experience*

A brand's visual experiences can impact consumer behaviour (Kim and Ah Yu, 2016; Molinillo *et al.*, 2022). The physical environment with the brand characteristics can create stimuli for the consumer to engage and interact. The sound, visuals, hearing, taste, and touch experiences are part of the sensory experience, and many studies have predicted a positive impact on satisfaction and loyalty (Wiedmann *et al.*, 2018; Iglesias *et al.*, 2019). From the perspective of mobile apps, exploring the sensory experience and seeing how the physical elements impact the digital world will be interesting. The AR technology's visuals, touch, and sounds have strongly impacted consumer behaviour in previous studies (Scholz and Smith, 2016; Chylinski *et al.*, 2020; Nikhashemi *et al.*, 2021). They have been explored separately but not as an AR brand experience. The current framework will explore it in the light of AR brand experience to understand the consumer-brand relationship and see how it affects

their satisfaction, continuous intention, and loyalty. Studies have shown that the sensory experience influences consumer satisfaction in different studies (Van Noort *et al.*, 2012; Alexander and Nobbs, 2020). Therefore, we propose the following:

H1a. Sensory AR experience has a positive impact on AR app satisfaction

#### *Affective AR experience*

The scholarly work has derived that emotional interactions and engagement of a consumer with the brand produce positive feelings (Ong *et al.*, 2018; Joshi and Garg, 2021). Brands' features can stimulate consumer behaviour by evoking attitudes and feelings. The affective experience in a consumer-brand relationship can produce satisfaction and loyalty (Hwang *et al.*, 2021). Emotions are essential when understanding the role and usage of technology such as AR. Previous studies have shown that AR experience brings positive outcomes in consumer behaviour through satisfaction and continuous intention (Ross and Harrison, 2016; Altarteer *et al.*, 2017; Leonard *et al.*, 2019). The service value, human engagement, and other physical features that reflect upon emotions positively impact satisfaction and loyalty (Mostafa and Kasamani, 2020). The sensory experience can develop affective engagement for the consumer if the brand can provide a wonderful experience. From the perspective of AR, it will be interesting to see how consumers behave with a bank's digital App that uses AR technology. Therefore, we assume:

H1b. Affective AR experience has a positive impact on AR app satisfaction

#### *Intellectual AR experience*

The use of intellectual experience can create curiosity and cognitive feelings through consumer-brand relationships (Arya *et al.*, 2019; Prentice *et al.*, 2019). Technology can also play an essential role in creating a strong impact on the consumer satisfaction and loyalty (Fang *et al.*, 2018; Molinillo *et al.*, 2022). The use of technology can invoke cognitive processes, which can lead to positive outcomes for the brand. Previous studies have predicted that the consumer will adopt technologies as long as they provide benefits and better experiences with usage (Javornik, 2016b; Chen *et al.*, 2021). It is shown by scholarly work that intellectual experience can

produce different thinking results among consumers (Mukerjee, 2018). The information that is stored in the mind can be further used for decision-making while experiencing the purchase of a product or service. AR technology has functions that can make consumers curious, engaged, interactive, and immersed in the usage (Hilken *et al.*, 2017; Rauschnabel *et al.*, 2019). Figure 1 represents the conceptual framework of this study. Therefore, using a mobile augmented reality app with brand experience dimensions will give valuable insights into the consumers in Pakistan. Brand promotions with AR functions can make consumers think and engage with the brand. We assume:

H1c. Intellectual AR experience has a positive impact on AR app satisfaction

### **Figure 1 – Conceptual Framework**

#### *Behavioural AR experience*

The behavioural outcomes derived from the adoption or the usage of a brand are part of behavioural experience (Mbama and Ezepue, 2018). The behavioural experience can influence positive satisfaction and loyalty in consumer behaviour (Karjaluoto *et al.*, 2016; Gómez-Suárez and Veloso, 2020). The behavioural outcomes can be different depending on the environment. Consumers desire outcomes that match their personality, lifestyle, and past experiences (Javornik, 2016a) but other consumers are looking for a thrill, entertainment, and strong bondage with the brand as the usage prolongs. Moreover, consumer psychology influences user behaviour, which in turn arouses consumers' emotional and cognitive motivations, experiential marketing likewise refers to consumer psychology (Puente and Cavazos., 2023; Minowa., 2020). Thus, we can develop an understanding that AR technology can evoke positive feelings and outcomes for consumers with its use. The behavioural AR experience will positively impact the consumer-brand relationship as it functions to be immersive, entertaining and novel. It will be interesting to see how Pakistani consumers will respond to the usage of MAR app of a bank. We assume:

H1d. Behavioural AR experience has a positive impact on AR app satisfaction



## **AR app enjoyment**

Activities that provide joyous experiences other than the outcomes are known as enjoyment (Ho *et al.*, 2017; Jang and Park, 2019). Enjoyment has been predicted on many levels, such as gaming, shopping experience, artificial intelligence, and tourism, leading to positive satisfaction and continuous intention (Wang *et al.*, 2020; Jiang *et al.*, 2021; Wang *et al.*, 2021a; Wang *et al.*, 2021b). According to the consumers' lifestyle, choices and behaviors, anything can be fun and enjoyable. Technology is one factor that has been shown to increase the entertainment factor during a consumer-brand relationship. Previous studies have shown that technology such as AR and AI improved consumer experiences as brand usage provided fun factors (Tao *et al.*, 2018; Asad Butt *et al.*, 2021a; Asad H. Butt *et al.*, 2021b). Enjoyment has been a critical factor in using AR technology (Gopalan *et al.*, 2016). AR technology has the functions of inducing entertainment during its use of it and providing an immersive experience. Hence, using MAR apps in the banking sector will be interesting as it may provide useful insights into consumer behaviour. We assume:

H2a. AR app enjoyment has a positive impact on AR satisfaction

H2b. AR app enjoyment has a positive impact on AR app's continuous intention

## **The moderating role of technology anxiety**

The application of augmented reality technology is expanding across the globe in industries like marketing, healthcare, and education. In order to disseminate information about their offers and improve the user experience in real time, marketers and advertisers are proposing new ways and methods of making their products visually more appealing and eye-catching (Huang and Liao, 2015). Technology emotions influence the satisfaction of consumers and using technology may produce emotional state or anxiousness on the individual's personality; this is termed technology anxiety (Gelbrich and Sattler, 2014; Maples-Keller *et al.*, 2017). If the technology anxiety levels are high, the individual may show less adoption of the technology. MAR apps have been shown in previous studies to produce positive outcomes on consumer behaviour and increase satisfaction and brand loyalty (Patel *et al.*, 2020; Rahimi *et al.*, 2020). But some consumers take time to adopt or accept a

technology. Pakistan is one country that takes time for a novel technology to be part of their life. The consumers in Pakistan wait for others to first engage with the technology and then use it. **The high levels of technology anxiety might evoke negative attitudes and adoption (Hyun-Joo Lee and Lyu, 2019; Nagaraj *et al.*, 2021). According to them, technology emotions inhibit the customer satisfaction and thus forms the basis for moderating role of such variable in our research framework.** the As the current study focuses on brand experience from the AR perspective, technology anxiety moderation plays a vital role in comprehending Pakistani consumers in the banking sector. It will let us know how much technology anxiety is affecting consumers during the usage of AR technology. We assume:

H3a. Technology anxiety moderates the relationship between sensory AR experience and AR app satisfaction

H3b. Technology anxiety moderates the relationship between affective AR experience and AR app satisfaction

H3c. Technology anxiety moderates the relationship between intellectual AR experience and AR app satisfaction

H3d. Technology anxiety moderates the relationship between behavioural AR experience and AR app satisfaction

## **AR satisfaction**

After its usage, the overall evaluation of a product or service is known as satisfaction (Chung *et al.*, 2018; Alkrajji, 2020). Satisfaction with the product functions, time, place, money, energy, and even technology may play a vital role as it enhances the overall consumer experience (Gong and Yi, 2018; Mahmoud *et al.*, 2018). Previous studies have shown that a satisfied consumer continues to use the product and develops brand loyalty (Wu *et al.*, 2016; Chun-Hsiung Lee *et al.*, 2018). In the case of AR technology, scholarly work has shown that the consumer experience is uplifted and high levels of satisfaction are achieved (Leonnard *et al.*, 2019; Tsai, 2020). The current framework will highlight consumer satisfaction from the perspective of AR in the banking sector of Pakistan. MAR apps are available in many industries; still, there is a lot of room for financial institutes to engage with such technology. Banks have already used AI chatbots and other AI services to enhance the consumer experience (Payne *et al.*, 2018; Rosman, 2018). We believe that consumers from

Pakistan will have good satisfaction levels with the MAR app of a bank. It will be able to provide information, promotion, interactivity, engagement, immersive experience, and enjoyment. We assume:

H4a. AR app satisfaction has a positive impact on AR app continuous intention

H4b. AR app satisfaction has a positive impact on brand loyalty

## **Methodology**

### *Sampling approach and data collection*

Participants were separated into two categories. The authors suggested collecting data from two sample sizes—one from a youngster who is single and the other married one. The two results will give valuable insights into how single and married respond to the AR brand experience. The two category samples were selected according to their experience with the brand, i.e., United Bank Limited (UBL) physically and with the UBL digital app that has AR functions. Previously MAR apps have been explored through survey and experimental studies by many researchers (Javornik, 2016b; Nikhashemi *et al.*, 2021). This is the first time in Pakistan a bank is offering AR features in their digital app, making it the MAR app. The UBL MAR app provides different information, promotions, discounts, and digital payments for their consumers. Understandably, consumers must have a UBL account to use the MAR app. As already explained, AR technology provides an immersive and pleasurable experience; therefore, the chances of introducing the MAR app were to the first enterer and then offering such experiences to the brand. UBL is a big bank brand in Pakistan and is in the top five banks of Pakistan with Multi-billion rupees worth of assets.

Thus, the sampling approach includes two sample sizes to provide exciting insights into consumer behaviour. UBL has more than 500 branches all over Pakistan. Our purpose is to find users using the UBL MAR app. We chose the city of Lahore, a big city of Pakistan with a population of more than 20 million. Customers who had an account with UBL and also had the MAR app were chosen as the participants. The survey was done online and also face-to-face. Most of the responses were collected face-to-face to get better insights about UBL's MAR app experience. Participants were asked to provide their experience with UBL digital

banking. MAR apps are still a new phenomenon in Pakistan, and the data collected were from people aged above 18 years onward. A total of 250 questionnaires were floated among the two-sample category. Non –probalistic purposive sampling was used for collecting data. Table 1 describes the respondents' demographic details, i.e., single and married. For the single-sample category, there were a total of 196, and for married, there were 201 responses recorded. After careful consideration, the repeating responses and incomplete ones were removed. Therefore, the single sample category had 172, and the married sample category contained 178 responses.

### **Table – I: Demographic profile**

#### *Procedure*

The first step is to identify the respondents who have had the brand experience of UBL. They were explicitly asked if they had the physical brand experience of UBL and who had availed the UBL's MAR app and experienced it under the criteria (Qin *et al.*, 2021). Both the sample category was informed about the details of the study to have better insights. The reason to use two sample categories is to understand how single Vs. Married behave and engage with the MAR app. And which sample category is more eager to use the benefits of the MAR app of UBL? The relationships of the variables in the current framework are new and require investigation. The study results are evaluated through Smart PLS-SEM. Different models were used to validate the outcomes, and SEM was assessed by bootstrapping (N=5000).

#### *Measurement details*

The scales developed in the current framework are adapted from previous studies of well-known scholars. The questionnaire was developed in English, and the literacy rate in major cities of Pakistan is better. Therefore, using the questionnaire in English was not a problem. The scale of AR brand experience was adapted from (Dwivedi *et al.*, 2018; Jaesuk Jung *et al.*, 2021). The scale of AR satisfaction was adapted from (Asad Butt *et al.*, 2021a). The AR enjoyment scale was developed by (Asad H. Butt *et al.*, 2021b; Ahmad *et al.*, 2022). The scale of technology anxiety was adapted from (Yang and Forney, 2013). The continuous intention and brand loyalty scale was

adapted from (Pedeliento *et al.*, 2016; Khamitov *et al.*, 2019; Nikhashemi *et al.*, 2021).

## **Data Analysis**

### *Measurement Model*

Through confirmatory factor analysis with SmartPLS and reliable parameter estimation, the psychometric qualities of the measurement models were assessed. As revealed in Table 2, all the questions had positive and statistically significant standardized path loadings (Bagozzi and Yi, 1988). Composite reliability and average variance extracted are above the standard values of .70 and 0.50, respectively (Table II).

### **Table-II Reliability and Validity (Overall Sample)**

HTMT ratio was used to test the discriminant validity of the constructs (Table 3); all the values are below the standard of 0.85, thus confirming the discriminant validity as suggested by (Henseler *et al.*, 2015).

### **Table-III Discriminant Validity HTMT Ratio (Overall Sample)**

#### **Table-IV Hypothesis Testing (Bootstrapping @5000 Subsamples)**

##### *Structural model*

The structural model was evaluated by Utilizing the 5000-subsampling technique and the PLS path model in SmartPLS software. Results in Table-4 and Figure-2 and Figure-3 depict that H1a (effect of Sensory AR experience on AR app satisfaction), H1b (effect of Affective AR Experience on AR app satisfaction), H1c (impact of Intellectual AR experience on AR app satisfaction), and H1d (effect of Behavioral AR experience on AR app satisfaction) accepted in single (Unmarried) respondents. In contrast, in married respondent samples, H1a and H1d are accepted; however, H1b and H1c are rejected. Similarly, H2a (effect of AR app enjoyment on AR app satisfaction) and H2b (Effect of AR app enjoyment on AR app Continuous intention) are accepted in unmarried respondent samples; however, in the married respondent sample, only H2a is accepted. Besides the direct effects, we have tested moderating effect of technology anxiety on the direct effect of AR brand experience variables and AR APP satisfaction. H3a (Technology Anxiety\*Sensory AR Experience → AR app satisfaction), H3b (Technology Anxiety\*Affective AR Experience → AR app satisfaction), H3c (Technology Anxiety\*Intellectual AR Experience → AR app satisfaction), and H3d (Technology Anxiety\*Behavioral AR Experience → AR app satisfaction) represent the moderating hypothesis, in married couple sample all the moderating

Hypothesis is rejected while the unmarried respondent sample on H3c is accepted; all other moderating hypotheses are rejected. Ultimately, we tested the direct effect of AR app satisfaction on AR app continuous intention (H4a) and AR app satisfaction on brand loyalty (H4b); these hypotheses are positive and significant in both samples. Overall, results strongly support that single or unmarried respondents are more likely to use UBL's AR App, while married people don't show as much enthusiasm as their single counterparts. Due to a developing country, Pakistan's married people are under pressure due to more responsibilities regarding the family, as Pakistan has a joint family culture. Therefore, they have an enormous workload; these are the possible reasons why married people have not shown much interest in AR technology use.

On the contrary, unmarried people are not pressured, as before marriage, they enjoy freedom having no responsibilities. According to our results, unmarried people are more attached to technology and feel more enjoyment in using new technology, therefore, showing more interest in the AR App of UBL bank. Figures 2 and 3 represent the married and unmarried structural model measurements.

### **Figure-2 Structural model (Married)**

### **Figure-3 Structural Model (Unmarried)**

#### *Goodness-of-Fit Index*

The goodness of Fit (GOF) index is intended to measure the complete model fit to verify that the model sufficiently explains the data (Tenenhaus *et al.*, 2005). GOF index values range from 0-1, where  $\leq 0.10$  is considered a small value to validate the model, 0.25 is regarded as a medium value, and 0.36 is considered significant enough to confirm the global validation of the research model and also indicates that model is parsimonious and reasonable (Henseler *et al.*, 2016). GOF index is calculated using Equation-1, where AVE is measured as (Geometric mean of Average Communalities) and average values of  $R^2$  of all variables (Tenenhaus *et al.*, 2005). The GOF value shown in Table 5 is 0.509, indicating a good model fit.

$$GOF = \sqrt{AVE * R^2} \quad \text{Equation-1}$$

### **Table-V Goodness of Fit Index (GoF)**

The table 6 represents the hypotheses details of both the sample categories.

### **Table-VI Decision on Hypothesis**

#### **Discussion**

AR technology application is increasing daily in different fields to boost consumer satisfaction and purchases (Pantano *et al.*, 2017; Chen *et al.*, 2021). There has been a lot of research on AR usage and adoption (Scholz and Smith, 2016; Rauschnabel *et al.*, 2019), but more investigation is required to comprehend consumer behaviour. The current framework focuses on understanding the AR experience, satisfaction, continuous intention, and brand loyalty. The results have predicted that the AR brand experience can positively evoke consumers' emotional and cognitive experiences, especially for the unmarried or single sample category. We have identified that technology anxiety plays a moderation role better in the unmarried category than married one. AR enjoyment has also predicted positive outcomes on satisfaction and continuous intention to use the MAR app of UBL. The results are contributing to the literature in multiple ways.

#### *Theoretical implications*

The outcomes of this study contribute to the continuous intention of MAR app usage and brand loyalty. Firstly, it is crucial to understand that the previous studies have focused on AR technology from the perspective of immersive experience (Bec *et al.*, 2019), enjoyment (Asad Butt *et al.*, 2021a), satisfaction (Leonard *et al.*, 2019) and adoption (Jang and Park, 2019). In this research framework, we investigated the impact of AR brand experience and its impact on AR satisfaction which leads to continuous intention and brand loyalty in the banking sector of Pakistan. Thus, it is a first of its kind of study investigating the AR brand experience from the married and unmarried sample category. We found that AR continuous intention improves explicitly and AR applications satisfaction directly leads to brand loyalty. This result is important as marketers must know that in developing countries, banking apps based on AR build brand loyalty significantly. AR technology in developing countries can increase overall satisfaction by marketing such apps in affectionate way and



conveying the message peripherally as consumers in those countries do not take time to understand or think about such apps. Thus, these apps need to be more attractive and interesting rather than just informative. Therefore, the results contribute to the literature on brand experience from the perspective of AR technology. Secondly, MAR apps are explored from the shopping experience regarding adoption and satisfaction (Chylinski *et al.*, 2020; Asad Butt *et al.*, 2021a). The current study has tried to understand the MAR app's role and impact from continuous intention and brand loyalty. This contributes to the literature on MAR apps from financial institutes and consumer behaviour perspectives.

Thirdly, innovative technology usage has risen, especially after the pandemic (Althunibat *et al.*, 2021; Sharma *et al.*, 2021). Thus, the use of AR technology is increasing in developed countries and developing nations. The study's results from the married and unmarried perspective contribute to the AR technology literature. We emphasize that in developing countries, married couples are under enormous financial pressures and are not gratified by AR technologies. In fact, the tendency does not allow them to take time out for understanding and using AR technologies. This will help in the development of AR theory. Fourthly, innovative technologies are providing mesmerizing experiences to consumers. One factor that is important in the usage of AR is enjoyment. Previous studies have also predicted that entertainment plays a vital role in comprehending consumer behaviour from an AR technology perspective (Gopalan *et al.*, 2016; Shafer *et al.*, 2019). The results contribute to the enjoyment of literature from the AR perspective. Lastly, previous studies have focused on understanding continuous intention and satisfaction (Poushneh and Vasquez-Parraga, 2017; McLean and Wilson, 2019; Ahmad *et al.*, 2022), but it requires more investigation into brand loyalty. The current study outcomes show that AR technology positively impacts continuous intention, especially brand loyalty.

#### *Practical implications*

The study results have shown that AR technology plays a positive role among digital banking users in Pakistan. The study adds value to the practical values from the MAR apps perspective that can be very useful for financial institutions. The MAR apps are commonly applied in the fashion industry, shopping experience, gaming domain, and tourism. And MAR apps are accessible from smartphones, tablets,

laptops, and desktops. In Pakistan, the number of savvy phone users is in the millions. Therefore, there is a strong base for brands in any industry to develop MAR apps to attract customers. Undoubtedly, the physical experience is essential, but AR technology is changing this. And MAR app has provided this change to the consumers. Therefore, banks can consider investing more in MAR apps to provide immersive experiences that could lead to brand loyalty and equity. Secondly, financial institutions such as banks can provide training and information to employees and customers on how to take advantage of AR technology. Consumers often do not wish to interact with frontline employee but still want the best services. MAR app can provide such functions of a frontline employee. This could be a good opportunity for banks to enter AR technology.

Thirdly, AR technology is not limited to just MAR apps. It can also be transformed into a physical retail environment. AR technology can remove language and interaction barriers and provide the same amount of word load and information compared to a frontline employee. Therefore, financial institutions can integrate AR technology into their physical retail environment to make the banking services work faster and more secure. Fourthly, the MAR app's purpose is not just to provide information and increase sales. But it can also work as a platform where brands can build strong consumer-brand relationships. This can lead to satisfaction, continuous intention, brand advocacy, and brand loyalty. Thus, investing more into AR technology would mean strong consumer-brand relationships with existing and perhaps new customers. Finally, MAR apps are not just meant for businesses that work only as a digital natives. MAR apps can also work for those brands that work on hybrid models. It is all about providing immersive experiences. This is why the current study was conducted to understand consumer behaviour from the AR brand experience perspective.

## **Conclusion**

AR is a disruptive technology that is changing consumer experiences. The outcomes of the current study have shown positive impacts on the consumer behaviour of the banking sector in Pakistan. The banking sector introduces the more MAR apps, the better the experience will be due to competition. The AR brand experience has predicted positive outcomes for the banking industry in Pakistan. Developing nations

like Pakistan are willing to equip their common person with innovative technologies. Step by step, brands in Pakistan are opting for AR technology. Thus, novel technologies will change how banking services work in the coming future. The results have provided vital insights from the AR perspective. Private and government banks can integrate this technology to provide an immersive experience to the customers.

### **Limitation**

The married and unmarried results show positive signs that AR technology is changing their behavioural decision, but there are a few limitations. Firstly, the research is limited to one country. Future studies can perhaps do a comparative study to understand consumer behaviour. For example, a study of AR brand experience from Pakistan Vs. India, or Pakistan Vs. Iran. Secondly, the sample size is not significant. If the sample size increases, the results might differ from the study's current outcomes. Thirdly, more cities can also be added to understand the consumer better. UBL is available in all major cities of Pakistan with many outlets. Therefore, Karachi, Islamabad, and Rawalpindi can also be considered for future studies. Fourthly, the new framework can be integrated with other theories, such as information system success, innovation diffusion theory, or Technology acceptance model, to have a different perspective. Finally, many variables can be used in future studies. Perhaps the use of brand attachment, attitude, habits, and innovativeness can be considered for future studies.

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