

# Linking AR-based experiences of Snapchat users with Customer Engagement, Loyalty and Satisfaction

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**Abstract.** AR is an exclusive sequence of interactive technological revolutions which integrate digital elements into the physical setting. Consumers have fun besides having great experience with AR apps and they wish to share their experiences and views with their friends through social media apps like snapchat. The objective of this study is to examine the relationship between AR-based experiences of Snapchat users and the resulting Customer Engagement, Loyalty and Satisfaction. A quantitative method was employed using survey as the primary research strategy. A total of 312 Snapchat (AR-based application) users participated in the survey. PLS-SEM was used for data analysis. The findings reveal that the vividness and novelty dimensions of AR have a positive impact on users' Engagement, Loyalty and Satisfaction. The results empirically supported and provided practical comprehensions for digital fun experiences among customers. Furthermore, retailers can integrate AR apps into their current marketing channels and provide consumers with the opportunity to acquire more information about the product/service and directly interact with the virtual Demonstrations. This research adds AR based experiences literature by advancing the AR literature which can be exclusively used in entertainment, retail and fashion industry.

**Key words:** Augmented Reality, Customer Engagement, Customer Loyalty, Customer Satisfaction

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## 1 Introduction

Covid 19 pandemic influenced the lives of people around the globe. Many technological tools have been introduced to avoid the physical interaction of consumers while purchasing goods or services (Farah et al., 2019; Riegger et al., 2021). Augmented Reality (AR) is one of the most influential ways for consumers to experience goods and services and has appeared in the digital market trend in recent years (Liu et al., 2023; Whang et al., 2021). AR is an interactive experience of a real-world environment where the objects that exist in the real world are boosted by computer-generated perceptual information (Wedel et al., 2020). Augmenting real-world stuff with virtual information creates an immersive shopping practice among consumers for ease of access to goods and services (Rauschnabel, 2021).

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In the era of digitalization, the retail industry is moving from bricks to click strategies (Cai and Lo, 2020). The preferences of today's consumers are rapidly changing especially the young ones as they are more extroverted, risk-takers and technology adopters (Sung, 2021). Therefore, consumers prefer to use social media channels, mobile apps and software before purchasing any good or availing services (Sangwan et al., 2023). Augmented Reality is becoming popular among consumers since it has interesting features which are easy to access and use. In the 21<sup>st</sup> century, AR apps reduce the gap between the real and virtual world (Javornik, 2016; Marell-Olsson et al., 2019). After the popularity of Pokémon used as AR technology many other brands like ZARA, IKEA, are using AR as their advertising technique. Consumers have fun and great experience with AR apps and they wish to share their experiences and views with their friends through social media (Grzegorzczuk et al., 2019). It is stated that continued usage intention, attitudes and behavioral intentions are predicted by AR experiential apps (Chen et al., 2021; Guo et al., 2025; Hsu and Liou, 2021; Jingen Liang and Elliot, 2021; Moro et al., 2021; Nikhashemi et al., 2021; Ozturkcan, 2021). For example, AR experiential apps have been found to impact consumer marketing in beauty products, retailing, furniture, apparel, tourism, gaming and medical/health sciences educational sector.

It is understood that consumer experiences in the real-world environment of a marketplace enables them to have an enhanced understanding of the products and services. This makes them able to evaluate the product and services accurately (Hoyer et al., 2020; Siqueira Jr et al., 2019). Moreover, there is little known about the impact of immersive technologies (through which consumers can experience products and services without touching and physically experiencing them before purchase) on consumers' experiences, subsequent behavioral intentions, purchase decisions and other consumer outcomes. Hence, there is a need to examine the impact of recent immersive technologies like augmented reality on various consumer outcomes ranging from consumer loyalty, involvement, engagement to behavioral intentions and (re)purchase decisions (Batat, 2021; Qin et al., 2021). Moreover, there have been recent calls to find whether AR apps lead to positive consumer outcomes (Hsu and Liou, 2021; Kowalczyk et al., 2021; Watson IV et al., 2018,?). Therefore, we attempt to find out whether AR helps companies offer unique experiences to consumers where they can feel more involved and satisfied before making an actual purchase. Therefore, the study attempts to examine the impact of augmented reality on consumer outcomes including their engagement, loyalty and satisfaction.

## 2 Literature Review

### 2.1 Augmented Reality

Augmented Reality (AR) is defined as "the superposition of virtual objects (computer generated images, texts, sounds, etc.) on the real environment of the user" (Sarkar and Bose, 2026). AR is a medium that integrates virtual data into real-life (Koumpouros, 2024). As a technology, AR overlays digital information on objects or places in the real world to increase the user experience. It denotes the addition of virtual things to real-world prospects to spread the competencies of scene visualization. AR is becoming famous among consumers due to its interesting features. Many renowned firms are using AR for promoting their brands and experiencing positive responses from their consumers. Consumers prefer brands that allows them a good and inclusive experience.

Also, consumers prefer those technologies which are beneficial and user-friendly for them. Thus, such technologies are very useful for consumers and retailers as well, because it allows

consumers to view themselves wearing diverse virtual products without physically trying them on in a store (Verhagen et al., 2014). Due to the advancements in technologies, manual systems have evolved to digitally driven systems. Consumers adopted wireless machines, and now they want touchless technologies in their life 24/7. Advance gadgets like tablets, smartphones, and smartwatches are being used and adopted by consumers all over the world. Social influence, advertising of brands, tracking locations can be made possible through contemporary technologies (Aggarwal et al., 2024; Teo et al., 2018).

Therefore, immersive technologies like AR are attracting consumers recently. AR influences collaboration, integration and applies to consumers, due to its ease of use, comfortability, and personalization. Microsoft HoloLens and google glass are prominent examples of AR. Pokémon gained its popularity in 2016 which also used AR. Sephora and L'Oréal are two cosmetic companies that introduce AR mirrors that provide virtual makeup experiences to customers (Jaekel et al., 2016). Amazon, Zara, IKEA, Nike, ASOS uses AR for their brands' promotion amongst consumers around the globe, while Sapharrire, Bonanza (Satrangi), and Hajjmented are local (Pakistan-based) AR-based examples (Backaler, 2018; Iftikhar; Saleem et al., 2021). Hence retailers develop AR experiential features through building apps for consumers for easy online shopping. Consumers can experience hassle-free selection to make buying decisions. AR apps allow consumers to have a real experience of visualizing their surroundings for shopping which includes wearable glasses, furniture, clothing, makeup. Therefore, the experience of such product categories has a positive impact on consumption behaviors.

AR is an exclusive series of collaborative high-tech revolutions which integrate digital elements integrated into the physical setting (Zhang et al., 2025). It boosts users' engagement through digital elements (Poushneh and Vasquez-Parraga, 2017). AR features from two dimensions are vividness and novelty. First is AR vividness i.e. distinct and inclusive graphical demonstration of a digitally generated entity into physical settings. Second is AR novelty, the exclusive user definite evidence that bridges the digital and real-world contexts. the virtual world and the physical world (Chen et al., 2024). Therefore, a brand's vivid demonstration is likely to stimulate customer attitude towards use as also suggested by Crofton et al. (2019), while novelty through AR apps enables customers to provide personalized experiences based on their preferences plus interests. AR apps provide comprehensive evidence relating to a practical invention through digitally mediated setting (de Ruyter et al., 2020).

### 2.1.1 Vividness

Vividness refers to "the ability of a technology to produce a sensorially rich mediated environment" (Steuer et al., 1992). It combines "the sensory experience of actual objects," with "hallucination," which is the "no sensory experience of imaginary objects" (Lee et al., 2004). Other scholars similarly echo this concept, labeling it as realness, realism, or richness (Sadowski and Stanney, 2002). McLean and Wilson (2019); Witmer and Singer (1998) and Zhang and Murthy (2024) explained it as the capability of technology to facilitate an immersive experience. It combines a digitally generated entity's graphical experience in the real-world settings to offer a precise look (Eckstein et al., 2019). It is evident that due to vividness, users can gather information regarding online shopping. In this regard, customers visually examine realistic displays through a virtual image of the product and can see the size, color, shape, and functions of the specific product (Zhu, 2019). Customers' attitudes can be influenced by the use of a brand's vivid display (Lee, 2021). It enriches the virtual products' physical appearance. Features of AR can vividly extend the sharp, unique, clear, detailed, and novel presentation of products that allow customers to understand the product's attributes (Barhorst et al., 2021). Moreover, a well-

defined and clear presentation enhances a clear demonstration of the digital offerings which are present in the real world which primarily impacts customer engagement for innovative technology (Lin et al., 2010; McLean and Wilson, 2019).

### 2.1.2 Novelty

AR combines the virtual and real-world that provides an exclusive graphical representation of digital entities for users (Barhorst et al., 2021). Different mobile apps based on AR have unique attributes that provide fresh perceptual cues, range, and scope (Tsai et al., 2020). In this context, novelty denotes new, vibrant, unique, and novel (perceptual cues) via AR tools (McLean and Wilson, 2019). Carrozzi et al. (2019) identified that AR novelty can arise from the consumers while they show their devotion towards any novel, dynamic, exclusive, and diverse product. Scholars defined novelty as combining unusual and new stimuli (Yim et al., 2017). AR can be supposed novel when products are manifested as videos, pictures, or text (Javornik, 2016). Users of AR apps are allowed for placing virtual objects like body-worn devices in their actual surroundings. Therefore, this dynamic representation through AR apps gives a unique, personalized, and novel experience that users can feel how they look like (Not and Petrelli, 2018). In addition, AR apps allow users to personalize their content according to their desire, interest, and preferences. AR apps provide complete information in a virtual environment of a real product (Chylinski et al., 2020).

## 2.2 Snapchat

Digitalization allows immersive technologies to grab the attention of customers, while companies offering contemporary technologies have gained a competitive edge (Partarakis et al., 2025). AR apps are becoming famous among youngsters, as they allow them to experience virtual objects in a real-world environment (Tuli and Mantri, 2021). Hence, such apps permit the customers to view and experience digitally generated products' precise attributes in the actual surroundings (Kim et al., 2020). A 2021 survey of top AR apps revealed that those brands boasted their products for dynamic experiences that add customer touchpoints (Japutra et al., 2021). Those AR apps include IKEA, glass on, Youcam makeup, Snapchat, Google lens, Wanna Kicks (Designed specifically for sneakers). Similarly, Snapchat is a famous app that gives vivid and novel experiences to customers (Cristofaro et al., 2023). Youngsters use social media for sharing their experience regarding AR apps, in this way users of Snapchat also share their snaps and videos (Cesário and Nisi, 2022). Through Snapchat filters like face recognition etc., it gives a clear, unique, and interesting experience to individuals specially the generation Z (Javornik et al., 2022). Snapchat lenses gives vigorous and enjoyable experience to its users (Dodoo and Yoon, 2021).

## 2.3 Augmented Reality and Customer Engagement

Customer engagement has been studied as an outcome of various brand characteristics and customer experiences (Islam and Rahman, 2017; Prentice et al., 2019). Customer engagement literature maintains that such engagement results when the customers have a satisfying relationship and emotional bonding with brands (Ganesan and Kumar, 2024; Pansari and Kumar, 2017). Researchers have also studied customer engagement from the perspective of evolving technologies. For example, noted that firms can engage customers through evolving technologies as it improves the firm-customer interaction and makes the experiences richer and more

customized (Hollebeek et al., 2019). Moreover, they noted that emerging technologies provide marketers with the flexibility to improve various planning stages and enhance customer experiences at touch points to attain higher levels of CE.

A customized experience generally results in a positive evaluation as Starbucks offers personalized beverages to engage customers (Keeling et al., 2019). Virtual reality-based gamification, 3D printing and contactless service provision are also examples of technology's use to increase CE (Hao and Chon, 2021). AR as an emerging technology represents such a situation where customers can have a customized and enriched experience of the products/services offered by a company (Hoyer et al., 2020; Loureiro et al., 2020). Given the fact that there is a dearth of studies examining the AR-engagement relationship and in line with the literature of the field in evolving technologies, it is plausible to state that AR-based experiences have the potential to engage the customers. Hence, we hypothesize the following.

*H1: AR-based experiences are positively related to customer engagement.*

## 2.4 Augmented Reality and Customer Loyalty

Customer loyalty (CL) can be defined as long-term compliance with the commitment of repurchase or revisit in future (?). CL is extensively measured in terms of repurchase and endorsement intentions (Gao and Liu, 2023). CL is a kind of relationship between firms and their customers, which can be developed through trust. Therefore, firms provide quality goods or services and generate profit (Bibi et al., 2025). With the increasing involvement of new technologies in firm-customer interaction and service provision, customers have started to gain unique experiences (Lei et al., 2025). Those experiences have been found to influence customer outcomes including perceived brand benefits, customer satisfaction, brand equity and customer loyalty (OH and Park, 2020; Shahid Iqbal et al., 2018; ?). Customer experience management (CEM) has emerged as an important determinant of customer outcomes and without proper CEM it is difficult to gain long-term customer loyalty (Homburg et al., 2017). Evolving technologies make it easier for marketers to provide customers with unique and enriched experiences as these technologies help them in managing CEM more effectively. According to Hsu and Liou (2021), AR-based experiences are also likely to enhance customer loyalty by providing the customers with unique experiences and real-life situations. For example, IKEA attempts to use AR to amplify customer experiences by providing customized furniture settings before even making a purchase decision (Ebrahimabad et al., 2024; Ozturkcan, 2021). Also in the restaurant sector, AR has been found to bring positive customer experiences and hence an important tool to improve firm-customer relationships (Batat, 2021). Therefore, we hypothesize the following:

*H2: AR-based experiences are positively related to customer loyalty*

## 2.5 Augmented Reality and Customer Satisfaction

Satisfaction is the judgment of delivering a pleasurable level of understanding through a product or service. Satisfaction is a response by the customer for realization and prosperity (Li and Peng, 2021). Customer Satisfaction (CS) can be defined as the dimension that determines the happiness of customers with a company's products, services, and capabilities (Ghali et al., 2024). It has been established that satisfied customers are engaged with repeat purchases (Islam and Hasan, 2026). According to previous research, most unhappy customers discontinue buying products from the firms (Keskin et al., 2025; Pusceddu et al., 2025). It means knowing

about satisfied customers can be an appropriate way to reduce unhappy customers and this can increase the profitability of a company (Viejo-Fernández et al., 2019).

Many factors have been found to impact customer satisfaction, which includes both service-related and user experience-related ones. For example, in Malacca, a study on internet banking showed that five factors influence CS. Those factors were service quality, security and privacy, content and web design, accessibility, and speed influence CS (Ling et al., 2002). It has been discussed that CS is an essential factor for developing a long-term relationship and CS is a substantial outcome of customer trust (Aslam et al., 2018). Young customers (millennial) study showed that brand identity and brand image have a positive impact on CS (Dash et al., 2021). Similarly, AR user experience is positively and significantly related to CS (?). AR apps increase customer satisfaction through brand engagement (Lin et al., 2024). Therefore, we hypothesize the following:

*H3: AR-based experiences are positively related to customer satisfaction.*

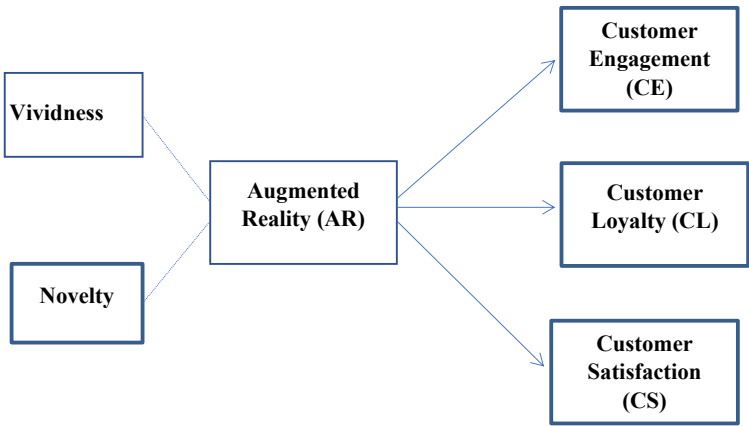


Figure 2.1:

### 3 Methodology

The study relies on positivism research philosophy because we are producing quantifiable data which leads toward statistical evidence, and it emphasizes facts. According to Aguzzoli et al. (2024), positivist research commonly adopts a deductive approach. Our research is explanatory and the nature of research is quantitative.

#### 3.1 Instrumentation

The study variables for each construct will be measured through standard instruments established and validated previously. The construct of AR contains two dimensions which are vividness and novelty. Two items of vividness and four items of novelty were adapted (McLean and Wilson, 2019). Sample items include, “the visual display of Snapchat through the mobile app was clear” (vividness) and “using the Snapchat mobile app makes me happy” (novelty). Four items of customer engagement were adapted from (Barasch et al., 2018). Sample items

include, “how much you enjoy the experience of snapchat?”. The customer satisfaction construct consists of 4 items adapted from [El-Adly and Eid \(2016\)](#); [Gallarza and Saura \(2006\)](#). Sample items include, “including the using of Snapchat made me satisfied”. The customer loyalty construct consists of 4 items adapted from [El-Adly and Eid \(2016\)](#); [Gallarza and Saura \(2006\)](#). Sample item includes, “I would be willing to recommend Snapchat to my friends”.

### 3.2 Sample and Data Collection

The study takes into account Snapchat users to collect data regarding the study variables. Mainly, Snapchat users consist of the target population for our study. Although people from different age groups use Snapchat, still a majority of them were young individuals. Research demonstrates that Snapchat users are younger, place more importance on social connectedness, have more reliance on graphics, have greater technological engagement, are more comfortable with technological multi-tasking, and show a greater preference for online social interaction ([Grieve, 2017](#)).

Moreover, young individuals are technology adopters and are more interested to have unique experiences. Therefore, different universities were approached for collecting the data. Snapchat is amongst the most popular apps among young individuals in Pakistan. Young people are attaining great fun and experience through Snapchat. Respondents were asked to give their genuine opinion while responding to the questions about AR experiences (vividness, novelty), customer satisfaction, customer loyalty, and customer engagement. Respondents were also asked to report their demographics as well including gender, age, and qualification. A purposive sampling method was used to contact the respondents since only Snapchat users became part of the survey. Survey data was collected from Snapchat users via both in-person and online methods. Participation was based on the willingness of the respondents. Five hundred questionnaires were distributed among Snapchat users in different universities in Pakistan. 312 usable responses were retained which represents 70%. The questionnaire documented the demographic data of respondents comprising their gender, age, and qualification. The demographics of the sample data are calculated through frequency analysis. The first demographic variable was related to the gender of the respondents. Out of 312, there were 192 females and 120 male respondents. The majority of sample 192 (61.5%) were female, while the remaining 120 (38.5%) were male. The second demographic variable was related to the age of respondents. Age is divided into five groups. The respondents were from the age brackets of 18-25 years (78.8%), 26-33 years (14.1%), 34-41 years (6.4%) and 42-49 years (0.3%) 50 years and above (0.3%). the age of most of the respondents ranged from 18-25 years, comprising 78.8% of the sample size. This indicates that in our sample, most of the respondents are between the ages of 18 and 25. This could be because this age group of individuals is tech-savvy and most early AR adopters. The third demographic variable was qualification, which consists of four groups. The distribution of the sample in terms of qualifications was that 0.3%, 23.4%, 53.8%, and 22.4% of the respondents had Matriculation, Intermediate, Bachelors, Masters, or higher qualifications respectively.

### 3.3 Assessment of the Measurement Model

The measurement model or outer model displays the relationship between constructs. This model is used to determine the construct validity and reliability. There are two aspects of construct validity, one is convergent validity and the other is discriminant validity. Convergent validity is assessed through factor (outer) loadings, Average Variance Extract (AVE). The relia-

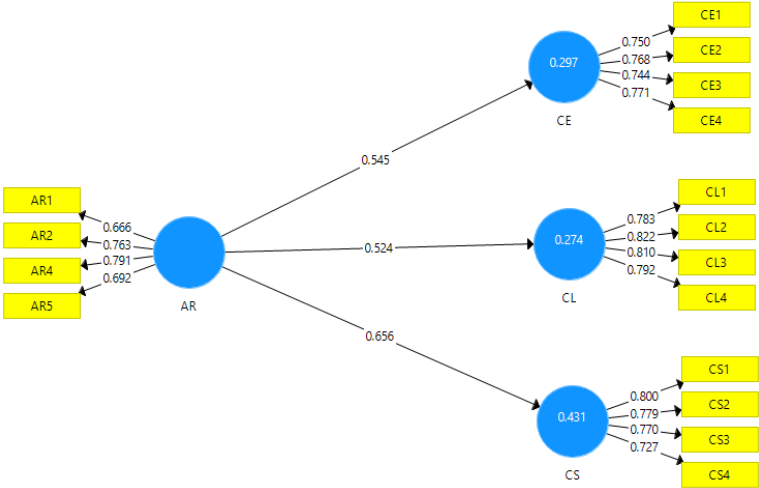


Figure 3.1:

bility of items of the respective constructs is evaluated through Composite Reliability (CR) and Cronbach’s alpha. Composite Reliability (CR) has a threshold of 0.7. CR for all constructs in this study is greater than 0.7, which meets the said criterion. Cronbach’s alpha has threshold of 0.7 and this study meets the said criterion. Convergent validity is assessed through AVE and factor/outer loadings. Moreover, the values between 0.4 to 0.7 can be retained, as it represents satisfactory reliability (F. Hair Jr et al., 2014). In the current study factor/outer loadings for each construct are in range (table 2). Therefore, it successfully met the reliability criterion of items. The criterion for AVE values should be greater than 0.5 (Yildiz, 2024). In this study, the values of AVE are greater than 0.5, so it fulfills the criterion. Therefore, the model meets the criteria of convergent validity.

Table 1: Reliability

| Construct | Number of Items | Cronbach Alpha | Composite Reliability |
|-----------|-----------------|----------------|-----------------------|
| AR        | 6               | 0.706          | 0.819                 |
| CE        | 4               | 0.754          | 0.844                 |
| CL        | 4               | 0.815          | 0.878                 |
| CS        | 4               | 0.770          | 0.853                 |

The measurement model is also assessed by discriminant validity. Discriminant validity is the extent to which a construct is truly distinct from other constructs and it can be evaluated through three approaches. First one is the Fornell and Larcker criterion Wang (2023), which states that the square root of AVE must be greater than inter construct correlation. Table 3 showed the square root of AVE in bold and Italic values which are greater than its inter-correlation constructs, which successfully met the criterion for discriminant validity. The second

Table 2: Convergent Validity

| Construct | Average Variance Extract(AVE) | Minimum Factor loadings |
|-----------|-------------------------------|-------------------------|
| AR        | 0.533                         | 0.666                   |
| CE        | 0.575                         | 0.744                   |
| CL        | 0.643                         | 0.783                   |
| CS        | 0.592                         | 0.727                   |

approach is cross-loading, which is helpful to evaluate if an item belongs to particular construct loads strongly with its main item instead of other item value in our research. In this study cross-loadings of all items of constructs are stronger on the basic constructs on which they belong instead of other constructs. Therefore, values of cross-loadings in this study show discriminant validity appropriately.

Table 3: Fornell-Larcker (Discriminant Validity)

|           | AR    | CE    | CL    | CS    |
|-----------|-------|-------|-------|-------|
| <b>AR</b> | 0.730 |       |       |       |
| <b>CE</b> | 0.545 | 0.758 |       |       |
| <b>CL</b> | 0.524 | 0.558 | 0.802 |       |
| <b>CS</b> | 0.656 | 0.626 | 0.656 | 0.769 |

Note: The elements in bold and italic in the diagonal represent the square root of AVE, and the off-diagonal elements show bivariate correlations between the constructs.

The third approach for assessing discriminant validity is Hetero-Trait-Mono-Trait (HTMT) ratio. HTMT ratio means the relationship is based on the assessment of the correlation amongst constructs. HTMT cutoff point is 0.9, which means values of HTMT should be less than 0.9. Hence in this study, all values of HTMT are less than 0.9, which successfully estimates the discriminant validity of constructs (Table 5).

Table 4: Heterotrait-Monotrait Ratio (HTMT)

|           | AR    | CE    | CL    | CS |
|-----------|-------|-------|-------|----|
| <b>AR</b> |       |       |       |    |
| <b>CE</b> | 0.733 |       |       |    |
| <b>CL</b> | 0.693 | 0.710 |       |    |
| <b>CS</b> | 0.882 | 0.823 | 0.831 |    |

### 3.4 Assessment of Structural Model

The Structural model represents the relationship between the latent variable hypothesized in the research model. The structural model is interpreted through path coefficient, p values, T values, The Structural model represents the relationship between the latent variable hypothesized in the research model. The structural model is interpreted through path coefficient, p values, T values,  $R^2$ ,  $f^2$  and  $Q^2$ .

### 3.5 Hypotheses Testing

The direct relationships between variables have been reported in table 5. The beta value of the relationship between Augmented Reality and Customer Engagement turned out to be 0.545 with a significant p-value and T-value. This indicates that our first hypothesis has been supported which identified that AR-based experiences have a positive impact on Customer Engagement. The beta value of the relationship between Augmented Reality and Customer Loyalty turned out to be 0.524 with a significant p-value and T-value. This denotes that hypothesis H2 has been supported which stated that AR-based experiences have a positive impact on Customer Loyalty. The beta value of the relationship between Augmented Reality and Customer Satisfaction turned out to be 0.656 with a significant p-value and T-value. This indicates that hypothesis H3 has been supported which stated that AR-based experiences have a positive impact on Customer Satisfaction.

Table 5: Path Coefficients

| Hypothesis | Path    | B     | S.D   | T-statistics | p_value | $R^2$ | $Q^2$ | $f^2$ | Decision  |
|------------|---------|-------|-------|--------------|---------|-------|-------|-------|-----------|
| H1         | AR → CE | 0.545 | 0.039 | 13.899       | 0.000   | 0.297 | 0.167 | 0.423 | Supported |
| H2         | AR → CL | 0.524 | 0.039 | 13.386       | 0.000   | 0.274 | 0.172 | 0.378 | Supported |
| H3         | AR → CS | 0.656 | 0.034 | 19.462       | 0.000   | 0.431 | 0.248 | 0.757 | Supported |

$R^2$  Coefficient of determination measures that how well a statistical model predicts an outcome. According to [F. Hair Jr et al. \(2014\)](#), the coefficient displays the effect and total variance of the predictor on outcome. According to [Cohen \(1988\)](#), when value of  $R^2$  lies between 0.02-0.12, it is weak, 0.13-0.25 considered as moderate and 0.26 and above values are considered as substantial ([Battour et al., 2024](#)). This study values of are above 0.26, which fulfills the criterion.

Effect size represented by  $f^2$  is a value used to measure the strength of the relationship between two variables. Rule of thumb by [Cohen \(1988\)](#), effect sizes of 0.02,0.15, and 0.35 are respectively termed small, medium, and large. In this study all the values of  $f^2$  are greater than 0.35, which meets the said criterion. Predictive Relevance ( $Q^2$ ) measures whether a model has predictive relevance or not and if values are greater than 0, is appropriate. In this study all the values of  $Q^2$  are more than zero, which meets the set criterion.

## 4 Discussion

The first hypothesis was about the association amongst AR-based experiences and Customer engagement. The relationship was built on literature and recent work on AR and CE. The results

supported the hypothesis. In today's world, customers are more engaged with social media apps such as WhatsApp, Instagram, Snapchat, Twitter, etc. Especially the young ones, as they are more exposed and technology adopters. They prefer to share their experiences through social media apps. Moreover, they also have concerns about the reviews and ratings through different social media channels, while acquiring goods and availing services. Snapchat is one of the most popular and the best android AR apps which has captivated millions of hearts already with its AR-powered filters and animations. The results have established that AR-based experiences have a vital role in customer engagement. Hence it is empirically supported that AR-based experiences have a positive impact on customer engagement. The findings are consistent with innovative services in using AR technologies has a positive influence on CE (Jessen et al., 2020).

The second hypothesis was about the relationship between AR-based experiences and Customer Loyalty. The relationship was hypothesized based on previous literature and recent work also demonstrates the relationship between AR and CL. Since we live in the era of digitalization, customers are more aware and use AR-based apps that increase their exposure to the virtual world. It is noticed that Snapchat is the best AR app for android users in making the 'Stories' popular, and its features were eventually adopted by other social media apps like Instagram. Therefore, it is evident that the customers enjoy using the Snapchat app a lot and share their pleasing experiences with friends on Snapchat and other social media channels. Hence these kinds of features of AR apps leads today's customer towards loyalty. The results have empirically established and supported that AR-based experiences have a positive impact on customer loyalty. The findings are consistent with AR with Hedonic Motivation and Efficiency significantly impact on CL (Lele and Shaw, 2021).

The third and the last hypothesis was related to AR-based experiences and customer satisfaction (CS). Many researchers have hypothesized the relationship between AR and CS. Globalization has created a lot of competition between brands and companies, so satisfying today's customer is a big challenge for them. Customers are well educated and aware of many things due to globalization and mass communication through different advertising activities through social media channels. Therefore, brands are striving to gain a competitive edge through introducing the most recent advertising campaigns like VR, and AR apps. Social media channels are now easily accessible and adaptable by today's customers, especially the young generation because they are connected to social media channels through their mobile apps 24/7. Attracting customers through AR apps is becoming popular amongst brands and companies. Instagram, Snapchat, and Facebook are the most recent social media channels which are using AR apps to attract customers. Hence customers are engaged in AR apps and becoming satisfied as well. In this study, the results have been supported empirically, and it is established that AR-based experiences have a positive impact on customer satisfaction. The findings are consistent with AR user experience is positively and significantly related to CS (Poushneh and Vasquez-Parraga, 2017).

## 4.1 Practical Implication

The study has vital practical implications as well which are significant for marketers and practitioners. In this regard the results of this study propose that companies need to be much more focused while designing their advertisement campaigns through social medial channels. Companies should highlight the features, quality, and design of their products and services in an effective manner that attracts customers and that leads to actual purchases. AR apps in the retail industry, especially shopping can be vital for customers' well-being from the perspective

of limiting the unintentional spread of Infectious diseases such as the recent COVID-19 global pandemic. Retailers can integrate AR apps into their current marketing channels and provide consumers with the opportunity to acquire more information about the product/service and directly interact with the virtual Demonstrations.

Immersive technologies play an important role in engaging customers. Many renowned companies are using AR apps for attracting their customers such as IKEA, L'Oreal (Modiface app), and Amazon. AR apps reduced the gap between the real and virtual worlds (Javornik, 2016). According to Forbes (An international technology-related magazine), AR is one of the five major technology trends in previous years. AR apps are very exciting, helpful & beneficial. Healthcare, fashion industry, tourism, Construction and Maintenance, Navigation Systems, gaming, retailing, etc all these are using AR apps for enhancing customer experience & strengthening their brand image (ÇALIŞKAN and KILCAN, 2023). According to Mkwizu and Bordoloi (2024), AR is also useful in the education sector as it enhances learning among students and teachers are using more dynamic techniques of teaching. Therefore, AR apps are becoming famous among people due to their ease of use and accessibility. Snapchat, Sketch Art, IKEA, Google lens, and Pokémon Go were the top AR apps in 21<sup>st</sup> century. In this study, Snapchat users' experiences are discussed and empirically supported, which empirically proved that AR-based experiences have a positive impact on Customer Engagement, Loyalty, and Satisfaction. Hence AR apps are playing a vital role for marketers and practitioners for attracting their customers. Pattarina (Sewing projects), How a Car Works, SketchAR, Mondly AR, i-Mechanic and Wanna kicks app are the most recent practical examples of AR apps and many other AR apps are making individual's life easy and comfortable. Moreover, AR is one of the most influential ways for consumers to experience goods & services.

## 4.2 Limitation and Future Research Directions

Despite having practical implications for researchers and practitioners, this study is not deprived of limitations, which delivers for potential future opportunities. First, this study involves survey based instead of experimental one. It has been noticed that experimental research is the most appropriate technique to confirm a cause-and-effect relationship. Second, the study used snapchat app while mobile experience is different from AR on in-store screens, mirrors and home computers. Future research should use other apps like ModiFace, GlassOn, YouCam Makeup app or Sephora to confirm that AR based apps enhance interactive communication linking retailers and customers caused by resilient visualization of products before purchases. Third, it is an essential description for social media existence for other consumers and influencers in the immersive involvement, as this reality significantly influences experiential values. Therefore, hedonic or utilitarian value can be used as mediator in the future research to gain real immersive technological experience by customers. Fourth and last limitation in this study is based on tech-savvy demographic aged group (18-25years) which cannot generalize to our findings. Therefore, our findings are expected to generalize to most early AR adopters, however future research should explore in how far customers with lower technology readiness possibly will experience diversity of customer engagement, loyalty and satisfaction of the hypothesized relationship.

## 5 Conclusion

Augmented Reality plays a vibrant role in the life of customers. AR-based apps are persuasive ways for consumers to experience goods & services. AR apps are established and executed in consumer markets to provide concrete information about goods or services. They have also created an exciting experience in electronic buying. Sellers and marketers must adopt and implement the most recent immersive technological trends to meet the needs of customers. Moreover, keeping in view the corona epidemic, industries via AR apps can be accommodating for achieving a market advantage to become industry leaders. The findings reveal a novel view to employing AR apps to boost customer outcomes. The study results specified a positive relationship between AR-based experience on customer engagement, loyalty, and satisfaction. The findings portray that marketers and retailers can use AR apps in education, telecommunication, tourism, and fashion industries to move from bricks to click strategies which can be very effective to increase sales and market share as well.

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