

**The Role of Customer Experience in the Relationship
between Augmented Reality and Purchase Intention in
Times of COVID-19: An Applied Study on the Online
Retail Sector in Egypt**

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Abstract:

This paper aims to investigate the impact of Augmented Reality (AR) in creating customer experience and purchase intention from the online shoppers' perspective in Egypt in times of COVID-19. The research depended on the quantitative research method. The primary data was collected by an online questionnaire. Convenience sampling was used. The sample size was 400. A total of 384 responses were collected and valid. The data were analyzed via (SPSS v22). The results highlighted that there is a significant relationship between AR, customer experience, and purchase intention along with a significant mediation effect. Additionally, the model has a high ability to predict the consumer purchase intention through AR and customer experience. The study recommends online retailers to depend on AR as a technology to create a memorable customer experience and purchase intention. The paper is limited to the online retail sector in Egypt, and findings may be applicable in the other sectors.

KEYWORDS

Augmented Reality, customer experience, Purchase intention, online shopping & the COVID-19 pandemic

المستخلص

يهدف هذه البحث إلى دراسة تأثير الواقع المعزز (AR) في خلق تجربة العملاء ونية الشراء من منظور المتسوقين عبر الإنترنت في مصر في أوقات COVID-19. اعتمد البحث على منهج البحث الكمي، وتم جمع البيانات الأولية من خلال الاستبيان عبر الإنترنت من عملاء متاجر ايكيا في مصر ، معتمدا على أخذ العينات الملائمة. وكان حجم العينة ٤٠٠ مفردة وتم جمع ٣٨٤ استمارة استقصاء صالحة و قابلة للاستخدام. تم تحليل البيانات عبر (SPSS v22). وخلصت نتائج الدراسة الحالية الى وجود علاقة ايجابية بين كلا من الواقع المعزز وتجربة العميل ونية الشراء إلى جانب تأثير الوساطة الكبير. بالإضافة إلى ذلك ، يتمتع النموذج بقدرة عالية على التنبؤ بنية شراء المستهلك من خلال الواقع المعزز وتجربة العميل. توصي الدراسة تجار التجزئة عبر الإنترنت بالاعتماد على الواقع المعزز كتقنية لخلق تجربة عملاء لا تُتسى وزيادة نية شراء. يقتصر البحث على قطاع البيع بالتجزئة عبر الإنترنت في مصر وقد تكون النتائج قابلة للتطبيق في قطاعات أخرى.

الكلمات المفتاحية

الواقع المعزز وتجربة العملاء، نية الشراء، التسوق عبر الإنترنت، وباء الكورونا ١٩.

1. INTRODUCTION

The world has been exposed to different Epidemics in history, such as SARS, MERS, and swine flu (Balinska, 2009). As a result, consumer behavior and health risk mitigation behavior (Torre, 2009) are influenced by such Epidemics. Despite this, COVID-19 is considered the most widespread pandemic that has a great effect on the world economy. COVID-19 has affected the majority of business sectors, especially retailing sector that suffered a slump in sales. Consumer behavior has changed during the COVID-19 pandemic, due to the fear of infection and policies imposed by governments. Even though, previous literature has focused on the impact of COVID-19 on health and how people protect themselves (Gamma et al., 2017; Timpka et al., 2014), while consumer behavior has got little attention.

Because of social distancing, people have had to spend most of their time online. Therefore, Social Media platforms enabled customers to view more content of different brands. Therefore, the number of activities of the

followers of Brand sites has risen. As a result, online channels have become more important than before, and Marketing technologies will be necessary if marketers intend to provide customers with a personalized, unique, and memorable shopping experience (Arzhanova, 2020).

AR is perceived as a hedonic technology that creates a positive experience by making online shopping more enjoyable and pleasurable (Poushneh & Vasquez-Parraga, 2017). The positive experience created by AR has a great effect on consumers' purchase decisions. Therefore, customer experience can demonstrate the influence of AR on purchase intention in the retail context. In other words, AR as a technology can be beneficial for online retailers in times of COVID-19; as AR can play a significant role in encouraging customers to purchase as well as protecting themselves from infection. However, AR hasn't been investigated widely in the marketing context. The possible effect of AR technology on consumers has just been investigated in few cases (Kashif, 2018). In addition, limited research has been done to understand the role of AR in creating customer experience and how it can play a significant role in adapting consumers' purchase decision-making in times of COVID-19, such insights are important to retailers when considering investing in AR.

Therefore, the research aims to investigate the mediating role of customer experience in the relationship between online shopping with AR and purchase intention in times of COVID-19 from the perspective of online shoppers in Egypt. The study shows how purchase intention can be affected by AR with the involvement of customer experience, which is important in online shopping. Consequently, the study is considered as a guideline and reference for future studies. Moreover, the study can be beneficial for the retail sector when learning about how purchase intention can be alerted by AR.

2. LITERATURE REVIEW

2.1 Augmented Reality & Customer Experience

In times of COVID-19, the behavior of consumers and the way they shop have been changed. Therefore, the sales of the majority of retailers have been decreased. Social distancing was the reason behind the increase of consumers' online activities when they spent most of their time online. It is expected, physical interaction will be limited for a while, therefore, digital channels become more important, and marketing technologies will play a

significant role in providing consumers with the information they seek on the web (Arzhanova et al., 2020).

In a highly competitive and uncertain market, Technology has played a role in developing and reforming online shopping practices (Kim & Peterson, 2017). Retails should respond rapidly to the technological changes embedded by the new technologies if they plan to survive (Huang and Liao, 2014). Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR) are interactive technologies that can get the attention of both consumers and retailers.

AR is one of the interactive technologies, which can be used widely in the context of retailing (Caboni and Hagberg, 2019), especially with the development of the application of handheld devices. Henningsson et al., (2020) defined AR as "a type of Immersive Virtual Environment" where the user remains close to the real world and only enhances the real-world situation with a digitally induced experience". AR is a tool that "integrates real and computer-generated digital information into the user's view of the physical real world to appear as one environment" (Olsson et al., 2011), AR imposes virtual layers between the user and physical situations. The virtual layers can be textual information, or images, or recordings. The AR devices are portable and wearables such as cell phones, wearable, and fixed interactive screens (Carmigniani et al., 2011).

In times of COVID-19, AR can contribute to the retail industry, AR has a transformative impact, by giving retailers the opportunities to transform how people shop (Cullen, 2016), for example, the distance became unimportant with AR (Javornik, 2016), which helped in reducing the perceived risk when shopping online, in addition, AR contributed to brand recognition through novelty, as well as the hedonic value of AR contributed to customer experience (Henningsson et al., 2020)

As revealed by Javornik (2016), Augmented reality technology has become more widely used by well-known brands to enhance online shoppers' experience, AR is a real-time interactive technology that provides customers with more information such as information images, videos, and written information, by combining the physical world with virtual layers. For example, Sephora, Ray ban, and Adidas have used AR technology in the form of a virtual mirror, which helped customers to experience the products more realistically.

Therefore, AR can help customers to feel less uncertainty when shopping online and make a better evaluation for the products. AR provides more visual and detailed information, as well as letting customers try on products through virtual layers (Olsson et al., 2012), which creates a wonderful experience that leads to satisfaction for online shoppers (Poushneh & Vasquez-Parraga, 2017). AR increases the interaction between consumers and brands, which increases customers' purchase intention (Javornik, 2016).

AR is considered as an innovative approach that can capture customer's attention; AR can provide customers with an engaging visualization experience developed especially for them (Yuan & Wu, 2008). Such experience has a great effect on their purchase decisions. Therefore, AR is a promising technology that can play a significant role in transforming the shopping experience (Watson et al., 2018). Moreover, the co-operation between digital and traditional stores will change the retail stores' concept. Moreover, AR applications can play a significant role in enhancing customer's brand attachment through building a strong connection between customer and product even before purchasing it (Dacko, 2016). Additionally, AR applications provide the customer with a very personalized shopping experience (Watson et al. 2018). Briefly, AR as a hedonic technology can be helpful in times of COVID-19, AR can provide customers with a unique experience that can encourage them to buy and protect themselves from infection.

2.2 Augmented Reality& Purchase Intention in Times of COVID-19

During times of COVID-19, most countries were forced to restrict social life, as an attempt to slow the spread of the virus. The closure of retail stores was the result of such restrictions. At the same time, online shopping became the only alternative for the customers to satisfy their needs, especially with the restrictions imposed by the government and to protect themselves from infection (Akhtar, 2020).

Recent studies showed that purchase behavior is altered due to the COVID-19 crisis (Loxton et al., 2020), as individuals increased their online purchasing (Mason et al., 2020) and their consumption patterns may be changed in the long term (Kirk et al., 2020). Therefore, online retailers

need to understand consumers' purchase intentions during times of the pandemic to maintain a competitive edge (Koch et al., 2020).

PI is important to organizations that intend to increase sales and to gain profits. PI refers to customer willingness to buy from certain retailers. Papagiannidis et al. (2017) mentioned that Purchase intention is the willingness of customers to buy the offered good. PI is a kind of commitment that someone has to intend to buy, or purchase, or repurchases a product whenever needed. PI can help marketers to predict sales, which will be reflected in their promotional strategies. PI is affected by customer satisfaction, loyalty, and retention (Kashif, 2018; Abowarda, 2018).

Enhancing the interest toward products and promoting decision-making can be achieved by service augmentation that was adapted by several companies (Hilken et al., 2017). Therefore, AR applications spread faster in many different fields such as education, entertainment, medical, and robotics (Kim et al., 2014). Nevertheless, the actual benefits gained by AR in the retail context still need more investigation (Pantano et al., 2017)

In online shopping, AR provides potential advantages for retailers and customers. The distance is the main obstacle between shoppers and products; they feel doubts because they can't touch these products. AR as technology can solve such problems as well as providing shoppers with more information, which in turn increases the probability of purchasing (Schwartz, 2011). Additionally, the rates of conversion can be enhanced and returns can be decreased by AR as AR can help customers to visualize the product before getting it, which helps customers to make purchase decisions more confidentially (Dacko, 2016), resulting in decreasing the rate of returned items as well as decreasing the cost of returning the items to the retailers (Watson et al., 2018).

Moreover, the essential feature of AR applications is interactivity (Watson et al., 2018). Perceived interactivity means that "the interaction is perceived by the users as two-way, controllable, and responsive to their actions" (Mollen and Wilson, 2010). The previous literature shows that customers who interact and engage through AR have higher purchase intentions (Bilgihan et al., 2016). Therefore, most retailers have adopted widely AR as an interactive technology that is installed on smart devices (Huang and Hsu Liu, 2014). Therefore, AR as an interactive technology is changing the way that customers are connected in the shopping process. AR increases

the customers' engagement levels through interactivity and greater offered values, which improve purchase intention (Caboni and Hagberg, 2019).

2.3 The Mediating Role of Customer Experience in the Relationship between Augmented Reality and Purchase Intention in Times of COVID-19

In times of COVID-19, online shopping is the most appropriate means of purchasing. It can prevent consumers from contacting others, which lowers the probability of infection (Koch et al., 2020). In the context of online shopping, hedonic and utilitarian motives are significant antecedents of purchase intention. But hedonic motives are considered as the main predictor of online consumers' purchase intentions. Utilitarian motives are related to the usefulness of behavior such as time savings, while hedonic is related to the experienced enjoyment and entertainment from engaging in behavior such as experienced enjoyment when shopping online (Overby and Lee, 2006).

In other words, hedonic motives are positively related to online purchase intention (Lim, 2017), where entertainment and enjoyment are the main antecedences of purchase intention (Ribeiro et al., 2010). Therefore, in the highly competitive and uncertain market, companies have to provide their customers with unique experiences, not only offering them low prices, as the customer can switch to another competitor just by one click (Bilgihan et al., 2016). Therefore, many companies have depended on technologies to grow their business; AR can be one of these technologies that can help companies to reach their goal. Nevertheless, little is known about the ability of AR to create a positive customer experience and thus yield higher purchase intentions.

Customer experience is about the aggregate customer perception that is cumulated during the consumer journey, from getting information about the product until disposing of it (Jain et al, 2017). Companies depend on certain factors to create customer experiences, such as environmental conditions like colors, sound, service design, and the personalization of each touchpoint in the consumer journey (Mathwick et al. 2001). AR is one of these touchpoints, which can affect customer experience positively (Henningsson et al., 2020), which in turn helps companies to differentiate themselves from competitors. In the retail context, Customer experience can explain the impact of AR on purchase intention. AR provides

customers with more information about the products with Augmentation, which boosts the customers' experience at the time of purchase, decreases their anxiety, and makes decisions more comfortable (Poushneh and Vasquez-Parraga, 2017).

Previous studies related to AR user experiences proved that the shopping experience is affected by the hedonic and cognitive drivers (Cehovin, F. and Ruban, B., 2017). Papagiannidis et al. (2017) revealed that hedonic features are responsible for providing an enjoyable experience for the user through digital communication, which contains certain elements that create entertainment, such as graphics, animation, color, etc. Therefore, hedonic features play a significant role in using AR by directing the user's attention to what is perceived as exciting, as well as encouraging the user to make decisions and initiate behavior (Hilken et al., 2017).

Further, AR as an interactive technology allows customers to decide and handle the content they view. The customers can easily interact with that content. Therefore, the engagement level of the customers is increased, which is reflected positively in their experience (Scholz and Smith 2016). Additionally, AR-enriched customer experience has a high effect on customer's purchase intention, where the exciting, novel, and engaging shopping experience can affect consumer behavior, as customers are willing to pay their attention and time when they are involved in a meaningful experience (Domina et al., 2012). Briefly, customer experience plays a mediating role in the relationship between online shopping with AR and purchase intention in times of COVID-19. **Therefore**, the following hypotheses are proposed based on the above discussion:

H1: In times of COVID-19, there are relationships between Augmented Reality and the customer experience in the online retail sector.

H2: In times of COVID-19, there are relationships between customer experience and purchase intention in the online retail sector.

H3: In times of COVID-19, there are relationships between Augmented Reality and purchase intention in the online retail sector.

H4: In times of COVID-19, there are significant differences between customers' purchase intention based on their demographics (gender, age, educational level, and Frequency of online shopping) in the online retail sector.

based on the hypotheses development, the proposed research framework can be constructed as follows:

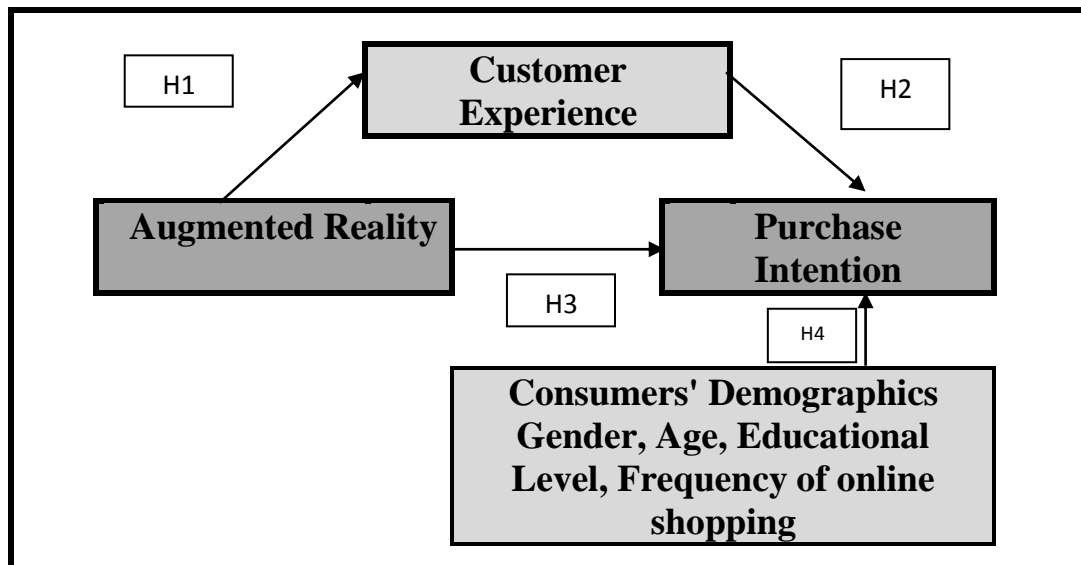


Figure 1: Proposed Research Framework
Source: Developed by the Researcher

3. METHOD

To achieve the aforementioned research objectives, descriptive research was chosen as a research format. The research depended on the quantitative research method. The secondary data and primary data were used for data collection. The secondary data sources included books, journals, newspapers, and websites. Primary data was collected through the online questionnaire, which was developed to capture the mediating role of customer experience in the relationship between Augmented Reality and purchase intention during the times of COVID-19. The questionnaire was developed from several literature reviews; the list consists of 10 items representing Augmented Reality, 8 items representing customer experience, and 8 items representing Purchase intention in times of COVID-19. These items were presented on a 5-point Likert-type scale, anchored from 1 (strongly disagree) to 5 (strongly agree). Following (Table 1) shows the Constructs and Items used for the current study.

Table 1: *Constructs and Items*

| <i>Constructs</i> | <i>Items - Referred to</i> |
|---------------------|---|
| Augmented Reality | <ol style="list-style-type: none"> 1. During COVID-19, this augmented reality application would let me visualize what the actual product is like (Henningsson et al., (2020) 2. During COVID-19, this augmented reality application would give me more information about the product as I would experience in a store (Javornik, 2016) 3. During COVID-19, this augmented reality application would Create a product experience similar to the one I'd have in a store (Olsson et al., 2012). 4. During COVID-19, this augmented reality application would allow me to interact with the product as I would be in a store (Scholz and Smith 2016). 5. During COVID-19, this augmented reality application would provide me accurate information about the products (Arzhanova et al., 2020) 6. During COVID-19, this augmented reality application would help me to make better product evaluations (Olsson et al., 2012). 7. During COVID-19, this augmented reality application would be valuable when shopping online (Olsson et al., 2012). 8. During COVID-19, based on the displayed images of the augmented reality application, I could imagine that the app has the potential to provide a good experience (Poushneh & Vasquez-Parraga, 2017). 9. During COVID-19, this augmented reality application can improve my shopping ability (Olsson et al., 2012). 10. During COVID-19, this augmented reality application let me visualize what the actual product is like (Olsson et al., 2012). |
| Customer Experience | <ol style="list-style-type: none"> 11. During COVID-19, I enjoy buying products online with this augmented reality application (Poushneh & Vasquez-Parraga, 2017). 12. During COVID-19, I am satisfied with online purchases of the product with this augmented reality application |

| | |
|--------------------|---|
| | <p>(Papagiannidis et al., 2017).</p> <p>13. During COVID-19, buying products online is entertaining with this augmented reality application (Papagiannidis et al., 2017).</p> <p>14. During COVID-19, shopping with this augmented reality application would be fun for its own sake (Hilken et al., 2017).</p> <p>15. During COVID-19, shopping with this augmented reality application would be enjoyable (Poushneh & Vasquez-Parraga, 2017).</p> <p>16. During COVID-19, shopping with this augmented reality application would be excited (Papagiannidis et al., 2017).</p> <p>17. During COVID-19, shopping with this augmented reality application would be interesting (Papagiannidis et al., 2017).</p> <p>18. During COVID-19, the product I visualized in the application is appealing to me (Han & Kim, 2010).</p> |
| Purchase intention | <p>19. The augmented reality experience increased my intention to buy the product online During COVID-19 (Papagiannidis et al., 2017).</p> <p>20. I currently intend to buy products online (Schwartz, 2011).</p> <p>21. I will try to buy products online During COVID-19 (Papagiannidis et al., 2017).</p> <p>22. This product would likely to be the one for me to own (Han & Kim, 2010)</p> <p>23. I would consider to buy this product (Papagiannidis et al., 2017)</p> <p>24. I would be very recommend to my friends to use the augmented reality in the application as a decision aid when considering what product to buy (Javornik, 2016).</p> <p>25. The augmented reality experience increased my intention to buy the product I visualized in the application (Javornik, 2016).</p> <p>26. The augmented reality application would be helpful in aiding to make purchase decision when considering buying the product (Dacko, 2016).</p> |

Non-probability sampling was manipulated as a sampling method. Convenience sampling was used as a sampling technique. The sample size is determined through the equation which takes a sampling error of ($\pm 5\%$), 95% confidence level and a maximum variation in the population (i.e. 50%). The results will yield to a sample size of 384 and the results of the present research sample can be safely generalized to the entire population. The content validity and construct validity were conducted. The questionnaire also includes demographic characteristics and was distributed online in February 2021 by the IKEA stores management in Egypt, which agreed to distribute it to its IKEA family customers (the most loyal IKEA customers). A total of 384 responses were collected and valid. Descriptive analysis, Cronbach's alpha, Correlation analysis, one-way analysis of variance (ANOVA), The Mann-Whitney U Test, Kruskal Wallis One-Way Analysis of variance Test, and Structural equation modeling were implemented to analyze the data using the Statistical Package for the Social Science (IBM SPSS v22) for Windows computer software.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis of the Sample

Demographically, the study found a relatively balanced distribution in terms of gender (52 % females). Respondents are youth (42% are aged 18 to 24 years old), which indicates that they have a higher propensity to engage in online activities. Mostly are well educated (75.5% have university degrees), which can affect their purchase intention. Further, about 50.5% are frequently engaged in online shopping four times a year or more, which can affect their experience.

4.2. Reliability Analysis

The reliability of each construct with its different number of statements can be measured by Cronbach's alpha. In this model, 2 constructs are focused on.

Table 2: Reliability Test for Constructs

| | <i>constructs</i> | <i>Cronbach's alpha</i> | <i>N of Items</i> |
|---|----------------------------|-------------------------|-------------------|
| 1 | Augmented Reality | 0.961 | 8 |
| 2 | Customer experience | 0.970 | 10 |
| 3 | Purchase intention | 0.948 | 10 |

The results in Table 2 indicated that Augmented Reality, customer experience, and purchase intention have a high-reliability coefficient (0.961), (0.975), and (0.948) respectively. Therefore, the surveys are reliable because the Cronbach's alpha and the internal consistency based on the corrected correlations are more than 0.5 (Hair et al, 2014).

4.3. Correlation Analysis

Table 3: the Pearson Correlations between Constructs

| | Augmented Reality | Customer experience | Purchase intention |
|----------------------------|--------------------------|----------------------------|---------------------------|
| Augmented Reality | | | |
| Sig. (2-tailed) | | | |
| Customer Experience | 0.947** | | |
| Sig. (2-tailed) | 0.000 | | |
| Purchase Intention | 0.953** | 0.962** | |
| Sig. (2-tailed) | 0.000 | 0.000 | |

**Correlation is significant at the 0.01 level (2-tailed).

In Table 3, all variables are positively correlated with each other, and there was a significant relationship between all constructs at 0.01 level in the model.

4.4. Regression Analysis

4.1.1. Testing the First Hypothesis H1

H1: In times of COVID-19, there are relationships between Augmented Reality and the customer experience in the online retail sector.

To test the validity of the first hypothesis (H1), a simple regression model was developed between customer experience as a dependent variable and Augmented Reality as an independent variable.

Table 4: Analysis of Variance between Augmented Reality and Customer Experience

| Dependent Variable | Model | Sum of Squares | df | Mean Square | F | P-value |
|----------------------------|--------------|-----------------------|-----------|--------------------|----------|-------------------|
| Customer Experience | Regression | 227.282 | 1 | 227.282 | 3330.74 | .000 ^a |
| | Residual | 26.067 | 382 | .068 | 8 | |
| | Total | 253.349 | 383 | | | |

In Table 4, the model shows that there is a significant relationship between Augmented Reality and customer experience. The significant level is .000.

The positive values show that there is a positive relationship. In addition, it is also confirmed through (F calculated = 3330.75) which is greater than (F tabulated = 3.021).

Table 5: Analysis of Simple Regression between Augmented Reality and Customer Experience

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| 1 (Constant) | .146 | .062 | | 2.362 | .019 |
| Augmented Reality | .950 | .016 | .947 | 57.713 | .000 |

In Table 5, the coefficient of the simple regression model of Augmented Reality proves the significance of the coefficient of the resource. The significant level is .000. In addition, it is also confirmed through (T calculated = 57.71) which is greater than (T tabulated = 1.967).

The coefficient of determination R-Sq is equal to 0.897 which means the effect of the Augmented Reality is 89.7 % in the variation of customer experience.

4.1.2. Testing the Second Hypothesis H2

H2: In times of COVID-19, there are relationships between customer experience and purchase intention in the online retail sector.

To test the validity of the second hypothesis (H2), a simple regression model was developed between purchase intention as a dependent variable and customer experience as an independent variable.

Table 6: Analysis of Variance between Customer Experience and Purchase Intention

| Dependent Variable | Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------------|------------|----------------|-----|-------------|----------|-------------------|
| Purchase Intention | Regression | 224.377 | 1 | 224.377 | 4718.026 | .000 ^a |
| | Residual | 18.167 | 382 | .048 | | |
| | Total | 242.544 | 383 | | | |

In Table 6, the model shows a significant relationship between customer experience and purchase intention. The significant level is .000. The positive values show that there is a positive relationship. It is also confirmed through (F calculated = 4718.026) which is greater than (F tabulated = 3.021).

Table 7: Analysis of Simple Regression between Customer Experience and Purchase Intention

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .254 | .051 | | 4.994 | .000 |
| Customer Experience | .941 | .014 | .962 | 68.688 | .000 |

In Table 7, the coefficient of the simple regression model of customer experience proves the significance of the coefficient of the resource. The significant level is .000. It is also confirmed through (T calculated =68.688), which is greater than (T tabulated = 1.967).

The coefficient of determination R-Sq equals 0.925, which means the effect of the customer experience is 92.5 % in the variation of purchase intention.

4.1.3. Testing the Third Hypothesis H3

H3: In times of COVID-19, there are relationships between Augmented Reality and purchase intention in the online retail sector.

To test the validity of the third hypothesis (H3), a simple regression model was developed between purchase intention as a dependent variable and Augmented Reality as an independent variable.

Table 8: Analysis of Variance between Augmented Reality and Purchase Intention

| Dependent Variable | Model | Sum of Squares | df | Mean Square | F | P-value |
|--------------------|------------|----------------|-----|-------------|---------|-------------------|
| Purchase Intention | Regression | 220.139 | 1 | 220.139 | 3753.34 | .000 ^a |
| | Residual | 22.405 | 382 | .059 | 0 | |
| | Total | 242.544 | 383 | | | |

In Table 8, the model shows that there is a significant relationship between Augmented Reality and purchase intention. The significant level is .000. The positive values show that there is a positive relationship. It is also

confirmed through (F calculated = 3753.344), which is greater than (F tabulated = 3.021).

Table 9: Analysis of Simple Regression between Augmented Reality and Purchase Intention

| Model | Unstandardized Coefficients | | Standardized Coefficients | T | P-value |
|-------------------|-----------------------------|------------|---------------------------|-------|---------|
| | B | Std. Error | Beta | | |
| (Constant) | 0.241 | .057 | | 4.220 | .000 |
| Augmented Reality | .935 | .015 | .953 | 61.25 | .000 |

In Table 9, the coefficient of the simple regression model of Augmented Reality proves the significance of the coefficient of the resource. The significant level is .000. It is also confirmed through (T calculated =61.265) which is greater than (T tabulated = 1.967).

The coefficient of determination R-Sq is equal to 0.908 which means the effect of the Augmented Reality is 90.8 % in the variation of purchase intention.

4.1.4. Testing the Fourth Hypothesis H4

H4: There are significant differences between customers' purchase intention in times of COVID-19 based on their demographics (gender, age, educational level, and Frequency of online shopping) in the online retail sector.

To test the validity of the fourth hypothesis (H4), Mann-Whitney U Test and Kruskal Wallis One-Way Analysis of Variance Tests were used as non-parametric tests to compare differences between two independent groups. In this research, the Mann-Whitney U test was used to compare the differences between two independent groups. It was developed between the answers of the respondents regarding their purchase intention based on their gender. In addition, The Kruskal-Wallis H test (one-way ANOVA by ranks), an extension of the Mann-Whitney U test, is used to compare multiple independent samples. The Kruskal-Wallis tests were used to assess the differences between the answers of the respondents regarding their purchase intention as a dependent variable based on their gender, age, educational level, and Frequency of online shopping as independent variables.

Table 10: Results of Analysis of Mann-Whitney Test for Customers' Purchase Intention According to Gender

| Variable | Gender | | Mann-Whitney U | Wilcoxon W | Z | Sig* |
|---------------------------|-----------|--------|----------------|------------|---------|-------|
| | Male | Female | | | | |
| | Mean Rank | | | | | |
| Purchase Intention | 267.91 | 123.12 | 4524 | 24624 | -12.821 | 0.000 |

In Table 10, the value of Sig (=0.000, 0.001) < 0.05, which means reject the null hypothesis (HO: the two groups are equal), and accept the alternative hypothesis (H1: the two groups are not equal), and the two groups are significantly different. Therefore, the hypothesis "In times of COVID-19, there are significant differences between customers' Purchase intention based on Customers' gender in the online retail sector" is supported.

Table 11: Results of Analysis of Kruskal-Wallis Test for Customers' Purchase according to Age

| Variable | Age | | | (Chi-Square) | Df | Sig* |
|---------------------------|---------------|---------------|-------------|--------------|----|-------|
| | From 18 to 24 | from 25 to 29 | 30 or above | | | |
| | Mean Rank | | | | | |
| Purchase Intention | 120.04 | 252.98 | 233.43 | 119.552 | 2 | 0.000 |

Table 12: Results of Analysis of Kruskal-Wallis Test for Customers' Purchase Intention according to Educational Level

| Variable | Educational Level | | | (Chi-Square) | df | Sig* |
|---------------------------|----------------------------|---------------------|---------------------|--------------|----|-------|
| | Pre-University/Certificate | a university degree | postgraduate degree | | | |
| | Mean Rank | | | | | |
| Purchase Intention | 190.35 | 187.96 | 272.83 | 6.567 | 2 | 0.038 |

Table 13: Results of Analysis of Kruskal-Wallis Test for Customers' Purchase Intention according to Frequency of Online Shopping

| Variable | Frequency of online shopping | | | | (Chi-Square) | df | Sig* |
|---------------------------|------------------------------|--------------|---------------|---------------------------|--------------|----|-------|
| | Once a year | Twice a year | Thrice a year | Four times a year or more | | | |
| | Mean Rank | | | | | | |
| Purchase Intention | 145.44 | 101.6 | 113.50 | 270.19 | 194.451 | 3 | 0.000 |

In Table 11, 12, and 13, the value of Sig (=0.000) < 0.05, which means reject the null hypothesis (HO: the groups are equal), and accept the alternative hypothesis (H1: the groups are not equal), and the groups are significantly different. Therefore, the hypothesis "In times of COVID-19, there are significant differences between customers' Purchase intention according to their age, educational level, and frequency of online shopping in the online retail sector." is supported.

4.2. Structural Equation Model Analysis for the Conceptual Model

To test the research hypotheses and the structural model prescribes the role of customer experience in the relationship between Augmented Reality and consumer purchase intention, and the interrelationships between constructs, the structural equation modeling (SEM) was conducted to determine whether the data fit the hypothesized model using the AMOS v22 program in this research. Confirming the structural relationship in a structural model can be done by using structural equation modeling (SEM). The properties of the research model are as follows: one construct, of which one was exogenous Augmented Reality and two endogenous (customer experience and purchase intention).

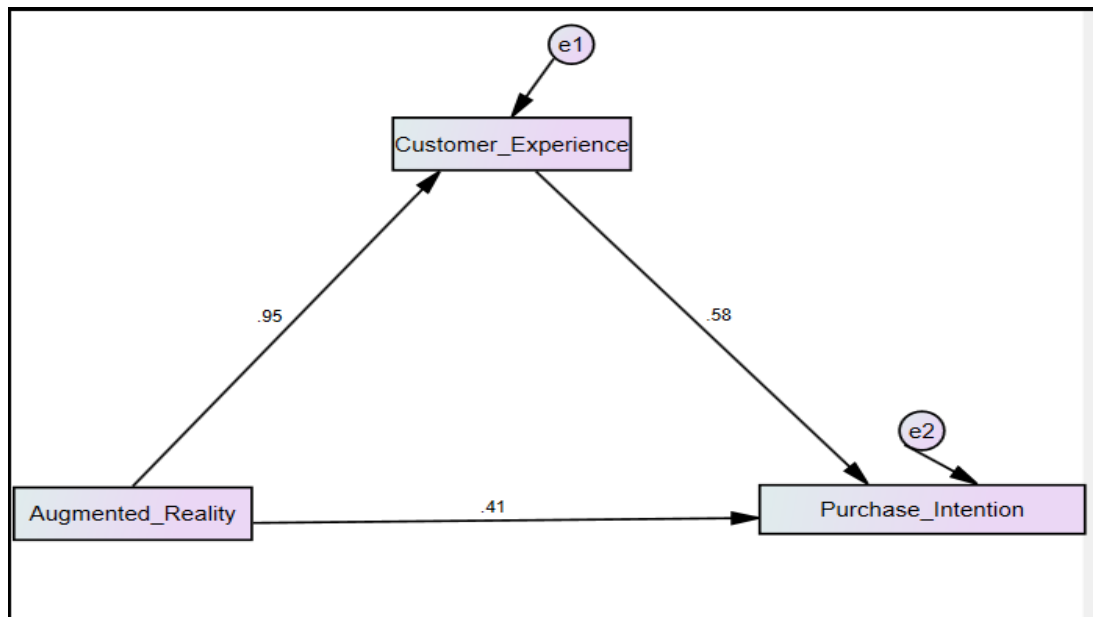


Figure 2: the Path Diagram for the Conceptual Model.

In Figure 2, a hypothesis is supported if the parameter estimate is significant and has the predicted sign (e.g., positive affect).

Table 14: Results of Structural Model Assessment

| H | | Estimate | S.E | C.R. | P | results |
|----|--|----------|------|-------|-----|-----------|
| H1 | Customer experience <-- Augmented Reality | 0.950 | .016 | 57.79 | *** | supported |
| H2 | Purchase intention <-- Customer experience | 0.566 | 0.38 | 10.56 | *** | supported |
| H3 | Purchase intention <-- Augmented Reality | 0.398 | 0.38 | 15.06 | *** | supported |

From Table 14, moving on to the parameter estimates representing the research hypotheses, the result suggests that all signs of associations between the constructs are in congruence with the hypothesized relationship. This provides support for the validity of all constructs forming the model, which means all hypothesized were supported.

4.2.1 Mediation

The researcher relied on the SEM tool to produce an unbiased estimation of the mediating effect of latent variables (Koufteros, 2009). The potential indirect (mediating) effects in the model were judged based on their direction of effects, magnitude, and also their significance level. Regarding

the research model, there is a possible full indirect effect (full mediation) between Augmented Reality and purchase intention:

Augmented Reality → Customer experience → Purchase intention, where the relationship between Augmented Reality and purchase intention is possibly fully mediated by customer experience.

Table 15: The Results of Direct, Indirect (Mediating), and Total Effects.

| Relationship | Direct effect | | Indirect effect (mediating) | | Total effect | |
|-------------------------|---------------|---------|-----------------------------|---------|--------------|---------|
| | Value | P-value | Value | P-value | Value | P-value |
| AR → Purchase intention | 0.405 | 0.001 | 0.547 | 0.001 | 0.953 | .001 |

In Table 15, The results of the standardized indirect effects (two-tailed significance) indicate that the path Augmented Reality → Purchase intention, the indirect effect of Augmented Reality on purchase intention is 0.547, and the two-tailed significance (P-value= 0.001) is significant at the 95 % level of confidence, which means that there is a full mediation effect, where customer experience mediates the relationship between Augmented Reality and purchase intention. So, the null hypothesis will be rejected which is "H0: there is no indirect path between Augmented Reality and purchase intention. The mediation effect through a single mediator, also customer experience has a net mediated effect between Augmented Reality and purchase intention. In summary, customer experience is an effective mediator.

5. Discussion and Conclusion

The research contributes to the body of knowledge related to the impact of AR in the retail sector by developing a new model of how using AR technology affects a customer's virtual experience and in turn, affects their purchase intention in times of COVID-19. In such times, the fear of infection and policies imposed by governments enforced people to spend most of their time online, and online shopping became the only alternative to satisfy their needs. Technology has played a role in developing and reforming online shopping practices, where customers can switch to another competitor with just one click. Therefore, companies have to provide their customers with unique virtual experiences developed especially for them, if companies intend to increase their sales. AR as a

hedonic technology can capture customers' attention and provide them with such experience, AR provides customers with more visual and detailed information, as well as letting them try on products through virtual layers, AR helps customers to feel less uncertainty when shopping online and make a better evaluation for the products. Further, AR as an interactive technology increases the interaction between consumers and brands. AR can provide customers with an engaging visualization experience developed especially for them, Such experience has a great effect on their purchase decisions. Therefore, the study concludes that purchase intention can be affected by AR with the mediation role of customer experience, in the context of retailing especially in times of COVID-19.

6. Main Findings

The structured model is valid for use and has the following advantages:

- a) The reliability of all constructs of the model measured by Cronbach's alphas has higher degree rates from (0.962 to 0.947). These results are in agreement with previous studies (Henningsson et al., 2020; Javornik, 2016; Olsson et al., 2012; Poushneh & Vasquez-Parraga, 2017)
- b) All variables are positively correlated with each other, and there was a significant relationship between all constructs at the 0.01 level. These results are in agreement with previous studies (Henningsson et al., 2020; Javornik, 2016; Olsson et al., 2012; Poushneh & Vasquez-Parraga, 2017)
- c)
- d) The model has a high ability to predict and explain the customer experience through Augmented Reality, and this was proved by the validity of the first hypothesis (H1) through the value of (R-Sq = 0.897) in the model. These results are in agreement with previous studies (Javornik, 2016; Poushneh & Vasquez-Parraga, 2017; Yuan & Wu, 2008; Watson et al., 2018).
- e) The model has a high ability to predict and explain the customer experience through purchase intention, and this was proved by the validity of the second hypothesis (H2) through the value of (R-Sq = 0.925) in the model. These results are in agreement with previous studies (Poushneh and Vasquez-Parraga, 2017; Domina et al., 2012).
- f) The model has a high ability to predict and explain the consumer purchase intention through Augmented Reality, and this was proved by the validity of the third hypothesis (H3) through the value of (R-Sq = 0.908) in the model. These results are in agreement with previous studies

(Javornik, 2016; Schwartz, 2011; Dacko, 2016; Bilgihan et al., 2016; Caboni and Hagberg, 2019).

- g) There is a positive relationship between Augmented Reality and customer experience, and the effect of Artificial Intelligence is (89.7 %) in the variation of customer experience in the model. These results are in agreement with previous studies (Javornik, 2016; Poushneh & Vasquez-Parraga, 2017; Yuan & Wu, 2008; Watson et al., 2018).
- h) There is a positive relationship between customer experience and purchase intention, and the effect of customer experience is (92.5 %) in the variation of purchase intention in the model. These results are in agreement with previous studies (Poushneh and Vasquez-Parraga, 2017; Domina et al., 2012).
- i) There is a positive relationship between Augmented Reality and purchase intention, and the effect of Augmented Reality is (90.8 %) in the variation of purchase intention in the model. These results are in agreement with previous studies (Javornik, 2016; Schwartz, 2011; Dacko, 2016; Bilgihan et al., 2016; Caboni and Hagberg, 2019).
- j) Customers' purchase intention is affected by the demographics (gender, age, educational level, and Frequency of online shopping) in the model, and this was proved through testing the fourth hypothesis H4.
- k) Structural equation model analysis for the conceptual model proved that the parameter estimate was significant and had the predicted sign (e.g., positive affect), which means the three hypotheses were supported (H1, H2, and H3) These results are in agreement with previous studies (Javornik, 2016; Poushneh and Vasquez-Parraga, 2017; Cehovin, F. and Ruban, B., 2017; Hilken et al., 2017; Domina et al., 2012)

7. Recommendation and action plan

The recommendation provided by the current study and the action plans are formulated and summarized in Table 16.

Table 16: Recommendation and Action Plan

| Recommendation | Description | Action Plan |
|---|--|---|
| Online retailers should depend on AR technology in their business | AR can provide customers with personalize experience which in turn affects their future purchase decisions | First, Marketers should adopt and construct AR technology that is simple in installation as |

| | | |
|---|---|--|
| | | <p>well as application.</p> <p>Second, provide customers with an interactive helpline anytime they need a help.</p> <p>Third, the Chatbot facility installation can enhance the rate of answering queries.</p> |
| <p>online retailers should analyze the demographics of their customers (gender, age, educational level, and Frequency of online shopping)</p> | <p>Analyzing customers' demographics can help marketers to learn more about their customers' purchase intention in times of COVID-19, and provide them with unique and personalized shopping experiences. For instance, literate consumers are more willing to shop on retailers that adopt AR.</p> | <p>Marketers should depend on a mechanism to collect and analyze the data related to customers' demographics</p> |

8. Future Research

The following section contains some suggestions that may create numerous extensions and expansions to the current research.

- First, the research shows the benefits that AR can introduce to customers and brands, while the obstacles of AR could be a suggestion for future research.
- Second, the most significant limitation of this study is the use of an insufficient sample. The results may therefore not be representative of the perceptions of the whole population of customers. Future studies could address this problem by using larger samples worldwide.
- Finally, future research should investigate the mediating role of attitude towards AR in the relationship between AR and consumer purchase behavior. As well as the moderating role of Familiarity and the types of consumers that can affect the future purchasing decision.

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