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ANALYZING FACTORS AFFECTING SATISFACTION AND PURCHASE INTENTION TOWARDS MOBILE AUGMENTED REALITY E-COMMERCE APPLICATIONS IN INDONESIA

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ABSTRACT

The high internet economy value in Indonesia is supported by e-commerce, with beauty products as one of the top spending categories. Nevertheless, the majority of Indonesian women still prefer to buy beauty products at outlets. In 2019, augmented reality feature started to present in mobile e-commerce applications and allows users to try the product virtually. This research aims to analyze factors affecting satisfaction and purchase intention in mobile augmented reality e-commerce applications in Indonesia. Quantitative method was used in this research, with data collection through questionnaires. Data from 403 respondents were processed in SmartPLS 3.0 software. This research revels that purchase intention was affected by satisfaction, trade off price and value, perceived augmentation and perceived enjoyment. Meanwhile satisfaction is affected by trade off price and value, perceived augmentation, perceived usefulness, perceived enjoyment and system quality.

Keywords: *Augmented Reality, E-commerce, M-commerce, Purchase Intention, Satisfaction*

1. INTRODUCTION

The widespread use of e-commerce in Indonesia has contributed to the digital economy as much as USD 21 billion in 2019. This value has increased by 88% compared to 2015, and is estimated to reach USD 82 billion in 2025 [1]. As many as 90% of internet users in Indonesia made purchases on e-commerce during the past month, while 79% through m-commerce [2], making Indonesia one of the fast growing m-commerce markets. The value of e-commerce transactions completed via mobile devices reached USD 7.1 billion, with USD 5.3 billion generated through sales through applications [3].

The three largest spending categories in Indonesia e-commerce during 2019 were travel (including accommodation), electronic & physical media, and fashion & beauty. The spending amount in the fashion & beauty category reached USD 2.3 billion, increased 18% from the previous year [2]. The four highest-selling makeup categories in Indonesia are eye makeup, face moisturizer, face powder, and lipstick [4]. Despite advances in technology today, the majority of Indonesian women or 52.9% prefer official outlets as a place to buy beauty products, meanwhile 27.5% through e-commerce, and 20.4% through social media [5].

There are two main issues in purchasing beauty products. The first is delivery and authenticity issues, regarding mistrust due to errors in order delivery, poor packaging of goods, misleading websites, sales of non-branded products and uncontrollable delivery times. The second is perceptual issues, including invalid or confusing information, differences in color and size between online and the original product, not being able to try the product directly, and being unable to find the desired color when shopping online [6].

Augmented reality (AR) has been present in e-commerce since 2010, aiming to help consumers seeing virtual products placed in a familiar environment. Augmented reality enables users to add virtual furniture to actual rooms or virtual mirrors that allow users to virtually try on glasses, hairstyles, jewelry, clothes and makeup. The presence of AR is expected to bridge the loss of experience felt when entering the store, where customers can choose the items wanted to be purchased, trying the product directly, and substituting the sales department who explains the details of the product in stores. AR was also

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expected to minimize the dissatisfaction in online shopping, ensuring consumers that the product bought is as seen.

One of the fastest growing areas for AR is mobile augmented reality (MAR), due to the development of mobile phones which now has evolved to smartphones. There are 171 million users in Indonesia who access internet via mobile phone and spend an average of 4 hours 46 minutes per day [7]. Users mostly use mobile devices for killing time, either on leisure or travelling. The possibility of accessing information on wireless connection with great application interface makes users attached. Being widespread these days, extremely portable due to its lightweight, strong battery performance and the combination powerful CPU and camera makes smartphone as a very promising platform for augmented reality. The high penetration rate of mobile phones allows users to enjoy the AR experience wherever they are without having to pay for additional hardware, and without having to carry additional hardware [8]. The experience aspect is very important, especially in purchasing makeup, because consumers tend to be hedonic motivated [9].

The use of mobile augmented reality for the first time may be due to interest in trends, but users become disappointed with the existing limitations and will never try MAR again in the future [10]. Sensitivity and colour perception of the augmented reality display also play an important role, because when the results are not good enough, it will reduce user acceptance, resulting in users feel discouraged to use the application. Another problem that arises in the use of augmented reality is depth perception, such as how objects appear to be far away and smaller than they should be. In addition, the images taken can also look blurry because the augmented reality application has difficulty placing objects due to the inadequate quality of the camera.

The number of mobile augmented reality applications are increasing from year to year, mostly used for retail, e-commerce and product visualization needs. In relation to the sale of online beauty products, mobile augmented reality allows users who are potential consumers to be able to try various makeup without having to clean makeup repeatedly, as well as to share the test results of the makeup with friends and family, even to social media. The types of makeup that users can try through this feature include lipstick, mascara, eyeshadow, eyebrow makeup and foundation. The presence of augmented reality feature in e-commerce, especially in beauty product purchasing is rampant in 2019. In Indonesia, e-commerce that has this feature including Shopee (Shopee BeautyCam), Watsons (#ColourMe), Oriflame (Makeup Wizard), following Amazon and Alibaba in the international market.

When shopping online, shoppers mostly browse for products, followed by looking for discounts and offer, compared price, then purchase a product [11]. In [12] consumer survey, MAR shopping applications offer positive effects, as users feeling happier with what they have purchased, more likely to shop, more likely to tell others, more likely to visit the store, more satisfied with the seller, and more loyal to the seller. The disadvantages and negative aspects of mobile augmented reality shopping applications in the eyes of users include that users feel they have to provide too much personal information, lack of integration with shopping, not fast enough to be used routinely, not reliable enough for routine use, time consuming to learn about their use, and difficult to use. Difficulty in using applications will affect customer satisfaction and usage intentions, so this factor requires attention. Application compatibility with the operating system (OS) on the user's phone is also an issue, especially for older OS that tries to run newly developed applications. The low number usage of MAR shopping applications was also shown in this survey. More than half respondents have never used MAR shopping applications, only 2% of respondents often use MAR apps for shopping, while 6% answered that they rarely use MAR apps for shopping.

The must to submit personal information was seen as a major negative by users. Apart from gathering users' images, users are also not informed about what will happen to the images that have been taken, and there is no guarantee that these images will be deleted [13]. In addition to personal information privacy issues, information privacy issues when conducting transactions through online media lead to a lower level of trust in online platforms [14]. Indonesia occupies the first position out of 26 countries surveyed by Kaspersky Lab in 2016 as victims of online financial fraud, and 17.1% of [15] survey respondents felt insecure about transactions carried out online. Hence, the research questions are formed as follow:

1. What factors affect satisfaction towards mobile augmented reality e-commerce applications in Indonesia?
2. What factors affect purchase intention towards mobile augmented reality e-commerce applications in Indonesia?

The objectives of this study is to analyse the affecting factors of satisfaction and purchase

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intention towards mobile augmented reality e-commerce applications, especially in Indonesia. The results of this research are hopefully can contribute to the theoretical knowledge in the area of online shopping by providing empirical evidence of the relationship between augmented reality, satisfaction and purchase intention, especially in Indonesia. The findings of this study are also hopefully provide guidelines on understanding Indonesia consumer behaviour on purchasing beauty products online, as well as consideration for e-commerce in implementing augmented reality technology.

2. THEORETICAL BACKGROUND

2.1 Purchase Intention

Purchase intention is a stage where consumers want to buy certain products or services offered [16]. The online transaction process consists of three steps, namely [17]:

1. Information search: where fundamental exchange of data between sellers and buyers happened, such as browsing, gathering information, and making product and price comparisons.
2. Exchange of information: where consumers provide personal information by registering e-mail addresses, explaining product preferences, and providing feedback.
3. Purchase: where consumers provide personal and financial information, such as credit card information, actual purchase preferences, payment information and addresses, to complete the purchase of a product / service.

The positive effects of mobile augmented reality (MAR) applications include increasing satisfaction and purchase possibilities, word-of-mouth behavior, and the possibility of direct visits to the store. This is due to the complete information and ability of MAR to convince consumers that the product purchased is in accordance with the wishes. Through MAR, consumers are more likely to access various products through the display of choices and product variations. Consumers also experience trialability and personalization which is not usually obtained in traditional online shopping [12].

2.2 Satisfaction

User satisfaction is not a component of system success, but a consequence of system success [18]. In the context of e-commerce, consumer satisfaction in online purchases consists of satisfaction in the purchase process and user satisfaction in using information technology [19]. Assessing consumer satisfaction, especially for high technology products and services, is very important. Satisfaction can have an important impact in getting new customers, both in positive and negative way. Customer satisfaction influences the consumer's decision to continue purchasing or not. Product characteristics, such as quality, ease of use, attractiveness, aesthetics and value for money must exceed consumer expectations for the product offered [20].

2.3 System Quality

System quality is a system where the desired characteristics of mobile devices and web browsing services are available to users [16]. A high-level quality system allows buyers to find products effectively and efficiently, thereby supporting buyer satisfaction [21]. However, there is no universal measure for System Quality, because it varies according to the type and purpose of the information system [18]. In e-commerce context, users value the quality from usability, availability, reliability, adaptability, and response time (eg, download time) [22].

2.4 Information Quality

Information quality is measured by the desired information characteristics of an information system [23], so that it can satisfy user needs [16]. As is the case with system quality, information quality also does not have a universal measure. Information quality in e-commerce refers to content, where content must be personalized, complete, relevant, easy to understand, and safe so that prospective buyers and suppliers conduct transactions via the Internet and return to the site regularly [22]. Meanwhile in augmented reality context, information quality refers to the extent to which it provides users with relevant and sufficient virtual content. Displaying too little information will make users dissatisfied, while displaying too much information will overwhelm users, so the quantity and reliability of virtual information must be based on user expectations and requests [13].

2.5 Perceived Usefulness

Perceived Usefulness (PU) is defined as the level at which a person believes that using a system can improve job performance [24]. In e-commerce context, PU refers to consumer perceptions that using the internet as a shopping medium improves the shopping experience. This perception affects consumer attitudes and online shopping intentions [25]. Online shopping is considered as useful by consumers if it serves their specific purchasing needs. If a product category or

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product variant does not meet consumer needs, the perceived usefulness will decrease. The availability of accurate product information also helps customers make purchasing decisions [14].

2.6 Perceived Enjoyment

In contrast to usefulness, enjoyment refers to the extent to which activities are considered enjoyable, regardless of all anticipated performance consequences [26]. Enjoyment reflects consumer perceptions of the potential for entertainment in online shopping, where it is a sense of pleasure experienced in the shopping experience, not from the completion of shopping activities. A purchase can occur unexpectedly because of the joy experienced [25]. Consumers can get a lot of information and can search and compare products from various online stores without having to talk to waiters, so consumers feel more challenged to buy suitable products. If consumers find online shopping enjoyable, they will tend to think online shopping is useful and develop higher usage intentions [27].

2.7 Trust

Trust is defined as an individual's belief in another for goodwill, competence and honesty. Customers have difficulty estimating whether their choice is trustworthy because the customer cannot check the shop, does not experience the product in person, and there is no guarantee of payment security [27]. The high level of security and privacy in the online shopping experience has a positive effect on consumer trust, because of the low risk of exchanging information. Misuse of consumer trust such as invasion of privacy, abuse of personal information, has a negative influence on attitudes in online shopping and discourages consumers from making future purchases. With this it can be concluded that the level of trust is positively related to consumer behavior and purchase intentions [28]. The main issue in using AR is control of access to users' personal information. Sometimes users are reluctant to provide personal information (name, e-mail address, location), because users do not know how the information will be used. Similar to pictures taken by AR, users are also not informed of what will happen afterwards. There is no guarantee that these images will be deleted [13].

2.8 Perceived Augmentation

Perceived augmentation quality refers to the extent to which users feel that augmented content is realistic. Consumers would feel an experience where reality and virtual work together when the augmentation has high quality [29]. Items that reflect the quality of augmentation include [13]:

1. Correspondence quality (mapping quality), the extent to which AR can integrate content (for example, information, images, or objects into the appropriate reality),
2. Self-empowerment (self-awareness), the extent to which AR is able to stimulate user awareness of their environment,
3. Information quality, the extent to which AR puts relevant and trustworthy virtual content into the real world.

Perceived augmentation is a strong predictor of the pleasant experience users experience with an application. The perceived quality improvement of augmentation is directly proportional to the user's pleasure and the possibility of the user to use an application, discuss it with others, or even buy a product that has been tried virtually [30].

2.9 Trade off Price and Value

Value is a concept of the exchange between quality and monetary sacrifice. Declining quality and / or increase in sacrifice will result in impairment, and vice versa. Consumers use price to judge quality and sacrifice. The more consumers emphasize the role of price over quality, the less negative the price value of sacrifice is. However, when consumers process information systematically, consumers consider sacrifice rather than quality [25]. Although prices play a role in influencing purchasing behavior, consumers do not always remember the price they paid for a product. The difficulty in remembering the price paid, however, is compensated by the ability to form evaluative judgments. While consumers cannot remember the exact price they paid for the product, they can easily indicate whether the product or service they purchased was priced too high, too low, or was worth the value received [31]. In the context of using technology, price is an important factor, because consumers must bear the costs associated with purchasing devices and services. When the benefits of using technology are considered to be greater than the monetary costs, the purchase intention will increase [32].

2.9.1 Price-value tradeoff and satisfaction

When consumers think that a service they received is valued lower than the value, they will show a higher level of satisfaction than consumers who think that services are valued according to the value they receive. Consumers who think that services are valued according to the value they

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receive will show a higher level of satisfaction than groups who feel that a service is valued too highly [31].

2.9.2 Price-value tradeoff and purchase intention

Consumers who think that a service is undervalued for the value they receive will show higher purchase intentions. Consumers who feel that a service is valued according to the value they receive has a higher purchase intention than consumers who think that a service is valued higher for the value they receive [31].

2.10 Previous Research

System quality has a significant effect on satisfaction [33,34]. When users feel that an application is difficult to use and does not load quickly, user satisfaction decreases. This is crucial, because satisfaction is a significant determinant of reusing e-commerce. In addition, [33,34] also found that information quality has a significant effect on satisfaction. However, when compared to information quality, [34] found that system quality has a more significant effect on satisfaction. In relation to purchase intention, [16] found that system quality and information quality had a significant effect, but [35] found that only information quality had a significant effect.

[19] and [36] found that perceived usefulness has a significant effect on satisfaction. Further, [19] also found that perceived usefulness has a significant effect on purchase intentions, as well as [35,37,38]. In relation to satisfaction, [36] found that perceived usefulness has greater significant effect than perceived enjoyment. [36] also found that the higher the perceived usefulness of AR, the higher the probability of purchase. Perceived enjoyment is a hedonic motivation which is one of the drivers of online shopping and affects satisfaction according to [20]. This finding is supported by [39] who states that pleasure and comfort are important factors for augmented reality users. However, [36] found that enjoyment had no effect on satisfaction.

Trust has an influence on satisfaction and purchasing behavior, even the effect is greater than perceived usefulness. However, satisfaction does not affect purchase intentions [19], while [37] found that trust has an influence on purchase intentions. [39] found that AR applications significantly increase consumer satisfaction in online shopping. Consumers who are satisfied with AR have a higher likelihood of shopping online, because the risks they face are smaller, such as a discrepancy between the displayed item and the original item. A similar thing was found by [40], because AR provides more complete information and entertains users. Perceived enjoyment and perceived augmentation are strong predictors of online shopping [41].

According to [33], users are reluctant, even do not use paid information systems, even though it is useful for them. This is because the perceived usefulness in the TAM method only captures the benefit component, and removes the component of the perceived sacrifice. Perceived Value has a wider range, namely the range of costs and benefits, and has a significant effect on satisfaction. [31] also found that the trade off price and value has a role in determining the level of satisfaction and purchase intention. Users who consider the price and value to be equal will show a high level of satisfaction and purchase intention. [20] also stated that price value is one of the drivers of online shopping, and has an influence on satisfaction.

3. RESEARCH METHODOLOGY

3.1 Research Model

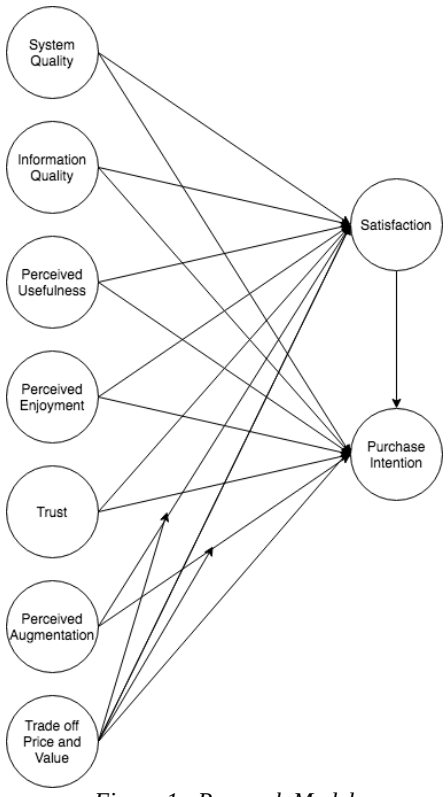

Figure 1 : Research Model

The identification of factors affecting satisfaction and purchase intention in this research is formed based on literature such as journal, text book, and other sources on the internet. The

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research model is presented on Figure 1. This research will take the population of mobile augmented reality e-commerce applications users in Indonesia who purchase beauty products.

3.2. Measurement Model

The variables and indicators used in this research were adapted from previous research and adjusted to the research topic, as showed in Table 1. All of the measurements will be obtained on a five-point Likert scale, ranging from 1 (strongly disagree) up to 5 (strongly agree). Appendix A lists all the measurement items in the questionnaire.

Table 1 : Variable Measurement

Variable	Measurement Adaptation
System Quality	[21]
Information Quality	[21]
Perceived Usefulness	[42]
Perceived Enjoyment	[36,41]
Trust	[13,43]
Perceived Augmentation	[41]
Trade off Price and Value	[40]
Satisfaction	[13,36]
Purchase Intention	[19,40,41]

Outer model analysis is used to evaluate whether the measurement scales used are valid and reliable. It consists of convergent validity test, discriminant validity test, and reliability test. The validity test will be measured using the item to total pearson correlation or by using a loading factor value with a limit of 0.7 and an Average Variance Extracted (AVE) value of 0.5. Therefore, if the loading factor value of an indicator shows ≥ 0.7, then the indicator can be said to be valid, and if the value of an AVE variable is ≥ 0.5 then the variable can be said to be valid. As for the reliability test, this research will use the Cronbach's Alpha value with a limit of 0.7 and a Composite Reliability value with a limit of 0.7. So that a variable will be said to be reliable if it has a Cronbach's Alpha value ≥ 0.7 and Composite Reliability ≥ 0.7 [44].

The equation of structural model developed based on research model in Figure 1 are :

$$S = \beta_0 + \beta_{11}SQ + \beta_{12}IQ + \beta_{13}PU + \beta_{14}PE + \beta_{15}T + \beta_{16}PA + \beta_{17}TPV + \beta_{18}PA.TPV + \varepsilon \ldots (1)$$

$$PI = \beta_0 + \beta_{21}SQ + \beta_{22}IQ + \beta_{23}PU + \beta_{24}PE + \beta_{25}T + \beta_{26}PA + \beta_{27}TPV + \beta_{28}PA.TPV + \beta_{29}S + \varepsilon \ldots (2)$$

Where:

SQ = System Quality
IQ = Information Quality
PU = Perceived Usefulness
PE = Perceived Enjoyment
T = Trust
PA = Perceived Augmentation
TPV = Trade off price and value
S = Satisfaction
PI = Purchase Intention

The inner model analysis is used to evaluate whether the structural model formed is robust. The value of the path coefficient and t-statistic will later be used to analyse whether the proposed hypotheses can be accepted or rejected. Path coefficient testing will be done by doing bootstrapping calculations, using 5,000 sub samples with a significance level (α) of 0.05. Therefore, if the output of the calculation shows a p-value ≤ 0.05, t-statistic value is ≥ 1.96, then the relationship between variables can be said to be significant and it can be concluded that the hypothesis is accepted. These regression equations will be estimated using SmartPLS 3.0 software.

3.3. Hypotheses Development

The hypotheses for this research are as follows:

H1: System Quality affects the satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H2: Information Quality affects Satisfaction of mobile augmented reality (MAR) e-commerce applications

H3: Perceived Usefulness affects the satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H4: Perceived Enjoyment affects the satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H5: Trust affects the satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H6: Perceived Augmentation affects the satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H7: Trade off Price and Value affects Satisfaction of users of mobile augmented reality (MAR) e-commerce applications

H8: Perceived Augmentation affects the Satisfaction of mobile augmented reality (MAR) e-commerce applications moderated by Trade off Price and Value

H9: System Quality affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications

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H10: Information Quality affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H11: Perceived Usefulness affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H12: Perceived Enjoyment affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H13: Trust affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H14: Perceived Augmentation affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H15: Trade off Price and Value affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications
H16: Perceived Augmentation affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications moderated by Trade off Price and Value
H17: Satisfaction affects Purchase Intention in mobile augmented reality (MAR) e-commerce applications

4. RESULTS AND DISCUSSIONS

4.1. Findings of Results

Research data were collected by distributing online questionnaires using a snowball sampling procedure. Respondents were contacted through messenger application and social media over a period of two weeks in July 2020 in Indonesia. Respondents were first asked whether they had ever used the mobile augmented reality e-commerce applications to buy makeup, and if they replied in the affirmative, they were asked to participate in the survey.

In total, data were gathered from 461 respondents. A manipulation check was performed by asking respondents to mention the name of the MAR e-commerce being used to purchase beauty products. Following data cleansing and removing those questionnaires that were not fully completed or missing values, the sample consisted of 403 valid responses. The characteristics of respondents in this research are presented on Table 2.

The age category of respondents is based on [5] which found that the majority of Indonesian women started using makeup at the age of 19-23 years. Most respondents in this research are young people, who is more open to new technology, and is the main target in online shopping as they are in productive age category. Young people is also tech savvy, and is likely to perceive AR applications useful and enjoyable. However, they may depend on their parents decision in making purchase decision [38,39].

Another highlight is most respondents mentioned Shopee as the most frequent used MAR e-commerce applications for purchasing beauty products. Shopee is a marketplace that dominates Indonesian e-commerce, facilitates many official stores, and the AR feature in its mobile application enables users to virtually try makeup products from several official cosmetic brands.

Table 2 : Characteristics of Respondents

Age	<19	85
	19-23	213
	24-28	56
	29-33	25
	>33	24
Occupation	Student	258
	Employee	88
	Unemployed	22
	Housewife	14
	Entrepreneur	12
	Others	5
	Civil Servant	4
Makeup Purchase Intensity	Once in a month	201
	2-3 times in a month	173
	4-5 times in a month	18
	>5 times in a month	11
Most Purchased Makeup Product Categories	Lip products (lipstick, lip cream, lip tint, lip balm)	347
	Foundation (liquid, cushion)	38
	Brow products	11
	Mascara	4
	Eyeliner	3
Makeup Monthly Spending	< IDR 200.000,00	218
	IDR 200.000,00-399.999,99	134
	IDR 400.000,00-599.999,99	33
	IDR 600.000,00-799.999,99	10
	>IDR 800.000,00	8
Most frequent used MAR e-commerce applications	Shopee	366
	Watson's	24
	Amazon	5
	Wardah	4
	Lazada	3
	Oriflame	1

4.2. Measurement Model

The data obtained from distributing questionnaires will then be tested for validity and reliability in SmartPLS 3.0 software. The results of the validity and reliability tests are shown in Table 3 below.

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Table 3 : Result of Confirmatory Factor Analysis

Variable	Cronbach's Alpha	Composite Reliability	AVE
System Quality	0.724	0.845	0.645
Information Quality	0.788	0.876	0.703
Perceived Usefulness	0.818	0.892	0.734
Perceived Enjoyment	0.799	0.882	0.713
Trust	0.906	0.930	0.725
Perceived Augmentation	0.834	0.901	0.752
Trade off Price and Value	0.882	0.927	0.808
Satisfaction	0.788	0.876	0.702
Purchase Intention	0.835	0.901	0.752

Table 3 shows all the Average Variance Extracted (AVE) were greater than 0.5, and as shown in Appendix A, all the loading factor were greater than 0.7. Hence, the convergent validity is satisfied. In general, all variables have a square root value of AVE that is greater than the correlation between constructs so that the research data can be said to be discriminant valid. The discriminant validity test result can be seen on Appendix B. Hence it can be said that the indicators and variables used in this research is valid.

The composite reliability value and the Cronbach's Alpha value of each variable is greater than 0.7. A variable can be said to be reliable if it has a composite reliability above 0.7, then all the variables used in this research can be said to be reliable and trustworthy.

Table 4 : Regression Statistics

	R^2
Satisfaction	0.638
Purchase Intention	0.641

Regression Statistics results show the R Square of first dependent variable – Satisfaction (S)= 0.638 tells this model contain 63.80% of variance in the equation in the equation model where 36.2% of another variance are explained in outside of the equation model. The second dependent variable – Purchase Intention (PI)= 0.641 tells this model contain 64.10% of variance in the equation model where 35.90% of another variance are explained in outside of the equation model. The R Square values for both dependent variables are categorized as moderate.

Table 5 : Regression Analysis Results

Hypotheses	Path coefficients	T Statistics	P Values
System Quality -> Satisfaction	0.099	2.092	0.036
Information Quality -> Satisfaction	0.051	0.869	0.385
Perceived Usefulness -> Satisfaction	0.193	3.463	0.001
Perceived Enjoyment -> Satisfaction	0.157	3.149	0.002
Trust -> Satisfaction	0.066	1.491	0.136
Perceived Augmentation -> Satisfaction	0.224	4.164	0.000
Trade off Price and Value -> Satisfaction	0.206	4.344	0.000
Perceived Augmentation moderated by Trade off Price and Value -> Satisfaction	-0.020	0.663	0.507
System Quality -> Purchase Intention	0.093	1.908	0.057
Information Quality -> Purchase Intention	0.051	0.840	0.401
Perceived Usefulness -> Purchase Intention	-0.009	0.142	0.887
Perceived Enjoyment -> Purchase Intention	0.169	3.160	0.002
Trust -> Purchase Intention	0.047	0.923	0.356
Perceived Augmentation -> Purchase Intention	0.145	3.114	0.002
Trade off Price and Value -> Purchase Intention	0.235	5.038	0.000
Perceived Augmentation moderated by	0.013	0.537	0.591

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Hypotheses	Path coefficients	T Statistics	P Values
Trade off Price and Value -> Purchase Intention			
Satisfaction -> Purchase Intention	0.260	4.857	0.000

The regression analysis results on Table 5 above show that system quality has significant influence on satisfaction, supporting H1. This finding is in line with [33,34] results. Meanwhile, H2 was rejected because information quality is not proven to have influence on satisfaction (p value ≤ 0.05). This finding is different from [33,34] results. Regarding the effect towards purchase intention, both system quality and information quality is not proven, thus rejecting H9 and H10 respectively. This finding is different from [16,35] results.

The Technology Acceptance attributes of perceived usefulness and perceived enjoyment influences satisfaction in MAR e-commerce applications, supporting H3 & H4. These findings are consistent with [19,20,36] also, supporting [36] that found perceived usefulness has more effect on satisfaction than perceived enjoyment. However, in this research, perceived usefulness could not generate influence towards purchase intention (p value ≤ 0.05), rejecting H11. These findings are not consistent with [19,35,37,39]. Meanwhile, perceived enjoyment influenced purchase intention, supporting H12, consistent with [30] that stated enjoyment as strong predictor of purchase intention.

This research also found that trust has no influence towards either Satisfaction or Purchase Intention (p value ≤ 0.05). Therefore H5 and H13 was rejected respectively. These findings are not in line with [19,37].

Perceived Augmentation has significant effect on satisfaction, supporting H6. This finding is in line with [38,40] results. This research also found that perceived augmentation has the most dominant effect towards satisfaction, as seen on the path coefficient value. Beside influencing satisfaction, perceived augmentation also has significant influence towards purchase intention, supporting H14. This finding is in line with [30,40,41].

Trade off price and value influenced satisfaction and purchase intention, supporting H7 and H15. This finding is consistent with [20,31,33]. However, trade off price and value has no moderating effect on perceived augmentation towards either satisfaction or purchase intention (p value ≤ 0.05), indicating H8 and H16 was rejected. This finding is consistent with [40].

Satisfaction was found to have significant effect on purchase intention, thus, H17 was supported. This finding is in line with [34]. Results revel that satisfaction has the most dominant effect towards purchase intention.

4.3 Difference from current literature

Compared to current literature, there are several differences that were found in this research. First, information quality has no effect towards both satisfaction and purchase intention. Considering this research focused on augmented reality e-commerce, not the traditional ones, the information quality variable might have been replaced by perceived augmentation. Perceived augmentation enhances information retrieved by users, allowing users to simulate the product.

Second, system quality has no influence towards purchase intention, which might be occurred due to AR technology is relatively immature at its current stage. Hence, it caused the application of not running smoothly and does not display well interface which might affects user's response. The difference of mobile phones used by users might also affect the performance of AR technology, which might result in this.

Third, the product range and colour variants that can be virtually tried are limited in augmented reality feature. Also, the product information are sometimes not complete, which might caused perceived usefulness has no influence towards purchase intention.

Lastly, trust has no influence towards both satisfaction and purchase intention. As mobile augmented reality e-commerce applications is still considered as new technology in Indonesia, this might caused users to be reluctant. Besides, Indonesia also has high numbers of online financial fraud.

5. CONCLUSIONS

The number of mobile augmented reality applications are increasing from year to year, and now it has been present on Indonesia e-commerce applications as a feature that allows users to virtually try makeup. However, there are only few study about this considerably new technology. This research aims to analyze factors affecting satisfaction and purchase intentions towards mobile augmented reality e-commerce applications in Indonesia, specifically on beauty and makeup products. Based on the research results, it can be concluded that satisfaction of mobile augmented

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reality e-commerce applications users in Indonesia is influenced by Trade off Price and Value, Perceived Augmentation, Perceived Usefulness, Perceived Enjoyment and System Quality. Meanwhile, purchase intention of mobile augmented reality e-commerce applications in Indonesia is influenced by Trade off Price and Value, Satisfaction, Perceived Augmentation and Perceived Enjoyment.

The significant role of trade off price and value in both satisfaction and purchase intention indicates that e-commerce should pay attention to the price offered to potential customers. Especially, when the customers are in young age with small amount of monthly expenditure and might depend on their parents for making purchase decision.

Perceived enjoyment was found to has influence on both satisfaction and purchase intention. One of the indicators used in this research to measure enjoyment is user's interest in trying different kinds of makeup through MAR e-commerce applications. We would like to suggest for the development of a similar application, developers increase the variety of makeup options that can be virtually tried, considering that currently there are not so many makeup options that can be tried. Wide range of products variety might also be able to increase the perceived usefulness, along with sales feature and various payment options, also "share" features.

This research found lip products as the most purchased products, as Indonesia is Southeast Asia country with the most lip products launched [45]. Considering the wide range of lip products colours variety, it is necessary to pay attention to the augmentation quality, in terms of images, colours, and mapping, so that users will be satisfied and ensure them to make purchase decisions.

Several limitations of this research should be noted. First, this research focused on augmented reality for makeup buying, thus, caution needs to be taken when generalizing the findings and discussion to other mobile augmented reality e-commerce applications. Second, the respondents in this research is women and young age, therefore, the interpretation of the results should be performed carefully. Future research can consider the role of gender and age in affecting mobile augmented reality e-commerce applications success.

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APPENDIX

APPENDIX A. Measurement Items

Variables	Indicators	Symbols	Loading Factor
System Quality	MAR e-commerce applications quickly load all the text and graphics	SQ1	0.769
	MAR e-commerce applications is easy to use	SQ2	0.838
	MAR e-commerce applications is visually attractive	SQ3	0.799
Information Quality	MAR e-commerce applications provide me accurate information	IQ1	0.803
	MAR e-commerce applications provide me up to date information	IQ2	0.861
	MAR e-commerce applications provide me sufficient information	IQ3	0.850
Perceived Usefulness	MAR e-commerce applications save my time	PU1	0.830
	MAR e-commerce applications help me make my purchase decisions	PU2	0.890
	MAR e-commerce applications help me find the most information about beauty product	PU3	0.848
Perceived Enjoyment	I have fun in using MAR e-commerce applications	PE1	0.874
	MAR e-commerce applications encourage me to try various makeup	PE2	0.847
	I do not see time go by while using MAR e-commerce applications	PE3	0.812
Trust	I trust MAR e-commerce applications keep my personal information (name, address, birthday) safely	T1	0.853
	I trust MAR e-commerce applications keep my financial information (credit card, bank accounts) safely	T2	0.853
	I am sure MAR e-commerce applications will not share my virtual try-on pictures to another party	T3	0.847
	I trust the information provided from MAR e-commerce applications	T4	0.850
	I feel safe in my transactions with MAR e-commerce applications are secure	T5	0.855
Perceived Augmentation	MAR e-commerce applications added virtual makeup to my face	PA1	0.892
	The makeup I tried on the MAR e-commerce applications seemed real	PA2	0.888
	The makeup I tried on the MAR e-commerce applications followed my facial movements well	PA3	0.819
Trade off Price and Value	The product offered in MAR e-commerce applications is reasonably priced.	TPV1	0.887

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Variables	Indicators	Symbols	Loading Factor
	The product offered in MAR e-commerce applications is a good value for the money	TPV2	0.899
	At the current price, the product offered in MAR e-commerce applications provides a good value	TPV3	0.911
Satisfaction	I am not complaining when using MAR e-commerce applications	SA1	0.795
	MAR e-commerce applications fulfils my makeup shopping demand	SA2	0.886
	I intend to tell my friends and family about MAR e-commerce applications	SA3	0.831
Purchase Intention	I would like to purchase the items I have virtually tried on MAR e-commerce applications	PI1	0.871
	I am willing to buy makeup via MAR e-commerce applications	PI2	0.883
	I will frequently purchase from MAR e-commerce applications in the future.	PI3	0.847

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APPENDIX

APPENDIX B. DISCRIMINANT VALIDITY TEST RESULT

	IQ	PA	PA-TPV-PI	PA-TPV-S	PE	PI	PU	S	SQ	T	TPV
IQ	0.838										
PA	0.652	0.867									
PA-TPV-PI	-0.129	-0.082	1.000								
PA-TPV-S	-0.129	-0.082	1.000	1.000							
PE	0.487	0.542	-0.157	-0.157	0.845						
PI	0.602	0.621	-0.125	-0.125	0.631	0.867					
PU	0.676	0.673	-0.141	-0.141	0.648	0.614	0.856				
S	0.624	0.659	-0.150	-0.150	0.631	0.714	0.686	0.838			
SQ	0.655	0.578	-0.079	-0.079	0.513	0.594	0.623	0.605	0.803		
T	0.545	0.473	0.015	0.015	0.527	0.556	0.510	0.551	0.526	0.852	
TPV	0.563	0.469	-0.214	-0.214	0.551	0.654	0.523	0.621	0.516	0.575	0.899