

Exploring the impact of Artificial Intelligence and Digital Marketing on Intention to Use Online Transportation: a Lesson Learned from Indonesian Millennials

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Exploring the impact of Artificial Intelligence and Digital Marketing on Intention to Use Online Transportation: a Lesson Learned from Indonesian Millennials

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Abstract: *This paper aims to investigate the influence of artificial intelligence and digital marketing on consumer buying intention. Artificial intelligence development has revolutionized digital marketing and changed consumer buying intention that boosts sales. Artificial intelligence and digital marketing combine the rapidly developing technologies so that everything is reachable in a simple touch that brings best practice to consumers. This paper uses quantitative approach that was stipulated from previous research on artificial intelligence, digital marketing and consumer buying intention. The analysis was carried out using structural equation modeling (SEM) based on partial least square (PLS), with 74 respondents. The novelty of this paper is that it examines the use in online transportation (Gojek) among the millennials. The results showed that artificial intelligence and digital marketing have positively effects on the buying intention. Practical contributions of this research is to inform service organizations and their management in their business development.*
Keywords – *Consumer Buying Intentions, Artificial Intelligence, Digital Marketing, Online Transportation,*

1. Introduction

The millennials are a generation of young people, characterized by the use of and the adaptation to technology in their daily lives, and specific shared values, life experiences, motivations, and buying behaviors. This generation was born between 1980 and 2000 (Lee & Kotler, 2016). They represented the 50 percent of global consumption by 2017 (Orozpe, 2014). In terms of buying behavior, the millennials constitute a large population and their purchasing power makes them an attractive target for many industries. Therefore, many studies have been focusing on the millennials. They have distinctive behaviors compared to other generations so studying them is important and relevant (Smith, 2011).

Purchase intention is a consumer's decision-making process, comprising the reason to buy a particular brand (Shah et al., 2012). Morinez et al. (2007) define purchase intention as a situation that makes a consumer buy a certain product in a certain condition. Consumers purchase decision is a complex process, related to consumers' behavior, perceptions and attitudes. Purchase behavior is a key point for consumers to access and evaluate a specific product, while purchase intention is an effective tool to predict buying (Ghosh, 1990). Purchase intention may be changed depending on price or perceived quality and value. Aside of this, consumers are also affected by internal or external motivations (Gogoi, 2013). In brief, there are six stages before consumers decide to buy a product, which are: awareness, knowledge, interest, preference, persuasion and purchase (Kotler & Armstrong, 2010; Kawa et al., 2013). Consumers always think that low cost purchase, simple packaging and little-known product is a

high risk as perhaps the quality of these products is questionable (Gogoi, 2013).

There have been many studies examining the influence of artificial intelligence, digital marketing on consumers' buying intention and the results have been conflicting. There has not been a study that examines the relationship between these variables and the simultaneous effects of these three variables. Artificial intelligence and digital marketing are the supporting tools of companies and industries in order to give the best service and qualities. Industries have to innovate continuously to reach the millennials. In this era, mass media have changed consumers' way of thinking by modulating emotions, needs, wants and demands. Market researchers and organizations spend billions of dollars on consumer research to identify the important factors that influence consumer decisions. Research as such is usually effective in detecting the orientation of consumers' behavior (Thapa, 2011). Nurturing a national digital transformation ecosystem and building an innovative and inclusive digital economy are the new state capabilities to fit with the demands of the digital age. (Hanna, 2018)

In Indonesia, Gojek is the first public transport online platform. Gojek provides many services, such as ride, food delivery, massage, cleaning service, go-box, that can be accessed on a mobile phone or any other gadgets. Gojek is currently cooperating with 40 company (Internal data Gojek, 2015). The app could be downloaded from Playstore, is easy to use and interactive, suitable with people's needs nowadays that require high mobility. To get good transportation, customers do not need wait by the street or go to the bus stop or taxi stand. Gojek is ready to serve customers, based on the nearest location from the consumer's orders. Gojek has been expanding their services to now cover other types of service

and is now supported with cashless payment Gopay, which is created by using artificial intelligence and being published and socialized by using digital marketing. This study aims to examine the influence of artificial intelligence and digital marketing on the millennials' consumers buying intention.

This paper consists of six sections. The first section is research background; second is literature review and hypothesis development consisting of Technology Acceptance Model (TAM), artificial intelligence, consumer buying intention, and the relationship between the variables; third section is methodology comprising population and sampling, research instruments and measurements; fourth section is data analysis and result, which discuss the results of this research with PLS; fifth section is discussion and the last section is conclusion and suggestion.

2. Literature Review and Hypothesis Development

2.1. Technology Acceptance Model (TAM)

The first TAM was developed by Davis (1985) based on the Theory of Reasoned Action (TRA) model. The most important advantage of TAM is because of its parsimony model, which is simple but valid. In addition, TAM has also been tested in a lot of research so the model is validated especially when compared to the (Theory of Reasoned Action) TRA and (Theory of Planned Behaviour) TPB models. TAM has five constructs, namely perceived usefulness, perceived ease of use, attitude toward using technology, behavioral intention to use, and actual technology use.

2.2. Artificial Intelligence

Artificial intelligence (AI), which is manifested by machines that exhibit aspects of human intelligence, is increasingly utilized in service and is a major source of innovation nowadays (Rust & Huang 2014). These developments are deemed as the direction towards the fourth industrial revolution where technology blurs the boundary between the physical, digital, and biological spheres (Schwab, 2017). AI as computing systems that would be able to engage in human-like processes. There are two major research streams related to the progress of AI, i.e. service and technology literature that discusses the positive sides of AI technology usage, and the economic literature discussing the effect of AI on employment. Literature on the use of AI in service industry tends to focus on applications (Colby, Mithas, & Parasuraman 2016; Marinova et al. 2017; Rafaeli et al. 2017). AI marketing is a method to leverage consumers' data to anticipate their next move and improve their journey. AI offers a way to bridge the gap between data science and application by sifting through and analyze huge data dump which was once an insurmountable process.

2.3. Digital Marketing

Digital marketing is the use of technologies in marketing activities to improve consumers' knowledge by matching their needs (Chaffey, 2013). Digital marketing on the other end is becoming popular because it utilizes mass media like television, radio and the Internet. The most common digital marketing tool used today is Search Engine Optimization (SEO). Its role is to maximize the way search engines like Google find a website. With the availability of so many choices for consumers, it is very difficult for marketers to

create brands and increase traffic for their products and services. Online advertising is a powerful marketing vehicle for building brands and increasing traffic for companies to achieve success (Song, 2001). Digital marketing is more cost-efficient for measuring return of investment of an advertisement and this fulfils companies' expectations in terms of producing results and measuring success (Pepelnjak, 2008). Digital marketing breaks monotony in the advertising industry and is so powerful that it can help revive the economy and can create tremendous opportunities even for governments to function more efficiently (Munshi, 2012). Growth in digital marketing owes to the rapid advances in technologies and the changing market dynamics (Mort, Sullivan, Drennan, & Judy, 2002). The Internet is the most powerful tool for businesses (Yannopoulos, 2011). Marketing managers who fail to utilize the Internet in their business marketing strategy will be at a disadvantaged position because the Internet is changing the brand, pricing, distribution and promotion strategy.

2.4. Consumer Buying Intention

According to Kotler and Keller (2003), consumer buying decisions is all their experience in learning, choosing, using, even disposing of a product. Schiffman and Kanuk (2004: 25), explain that external influences, awareness of needs, product introduction and alternative evaluation are the factors that influence consumer buying intention. This external influence are largely determined by marketing efforts and socio-cultural factors. Super and Crites (Lidyawatie, 1998) maintain that there are several factors that influence buying intention, namely:

- a) Job, which influences the interest based on, *inter alia*, the level of work load, daily activities, use of leisure time.
- b) Socio-economic, which means that someone who has a high socio-economic status will achieve what they want more easily than those who have a low socio-economic status.
- c) Hobbies and free time activities.
- d) Gender, which means that women's interests are different from men's interests.
- e) Age, which means different interest in buying an item, owning an object or doing an activity.

2.5 Relationship between Artificial Intelligence and Consumer Buying Intention

Recent studies show that AI was successfully used in health industry in tracking and deciding the optimal dose of the medicine for the long-lasting impacts and this has improved loyalty to company (Londhe & Bashin, 2019). More research by Shin, Tada and Managi (2019) examined the automatic driving technology in transportation that significantly reduces the number of accidents caused by human error and road congestion. The survey since 2015 reported that buying intention has been increasing. Tsai (2017) developed a location-based mobile tourism app that personalizes trip planning to make travel more effective and efficient. With AI, perceptions of usability and ease of use are affected so one's intention to do or buy something is also affected. In addition to this, AI can also reduce staff needs hence operational costs. (Bachdar: 2018). The similar purpose of Ching-Wei Ho and Yu-Bing Wang research (2015), the relationship with the brand, product, company and other fans on social media based

community can enhance post-purchase behaviors by improving individual community.

H1: AI has a significant impact on consumer's buying intention

2.6 Relationship between Artificial Intelligence and Digital Marketing

Research has shown the influence of AI on digital marketing. AI processes data into useful insights, thus can inform sellers in using social media as a marketing tool. With 2.4 billion people in the world interacting and sharing content on social media, as well as the sophistication of AI that is growing rapidly, it looks like AI and social media will have a bright future in the realm of marketing (Permana, 2017). AI records the history of consumer' interaction, how and with whom consumers interact so that needs, preferences and behavior of customers can be systemized. This allows targeting and retargeting in the production systems and can increase and contextualize data values (Sterne, 2017). According to research from Radicati (2018) there are 34% people around the world or around 2.5 billion using email marketing and this is increasing every year.

H2 : AI has a significant impact on digital marketing

2.7 Relationship between Digital Marketing and Customer Buying Intention

Previous research has shown the effect of digital marketing on buying interests. Katherine Smith (2011) With the increasing use of digital media, more and more companies are using digital marketing to reach the target market. Among the millennials, digital marketing gives a positive impact on sales. Social media marketing stimulates external factors and influences consumers' inner perceptions, and ultimately influences consumers' buying interest. Finally matching the characteristics of consumer purchase intentions based on social media marketing will inform company's decision making and support the development of electronic commerce (Maoyan, 2014) Social media facilitates consumer social interactions that lead to increased trust and intention to buy (Hajli, 2013)

H3: Digital marketing has a significant impact on consumer's buying intention

2.8. Research Framework

Based on literature review and hypotheses as explained above, we proposed and examined the research framework that presented in figure 1 below:

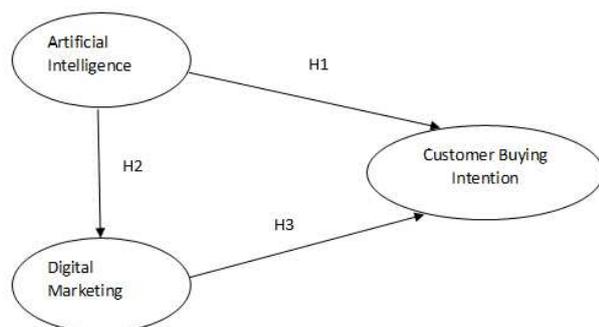


Figure 1.
Research Conceptual Framework

3. Methodology

3.1 Type of Research

The type of research used in this study is associative research with a quantitative approach. According to Suliyanto (2006), associative research aims to determine the relationship between two or more variables. The population in this study were millennials women in Mataram City. The number of samples was 100, with the following criteria:

- a. Aged from 19 to 34 years
- b. Actively using social media

3.2 Population and Sampling

This research was conducted by giving a quistonnaire online to 74 respondents. In this research, the criteria of millenials were determined by age, job, and the monthly income. Data shows that the dominant respondents were aged between 26 and 28 years. This age can be considered as a mature age, either for a women or a man. In terms of job, the dominant respondents are students, either those who are in diploma level, undergraduate or postgraduate degree.

3.3 Data Analysis Procedure

Likert Scale was used in this study, ranging from from very negative (one) to very positive (five). The data analysis technique was Stuctural Equation Modeling (SEM) based on Partial Least Squares (PLS) using SmartPLS software version 3.0. PLS is a variant-based SEM analysis that can simultaneously test measurement models and can also test structural models (Abdillah & Jogiyanto, 2009). The measurement model (Inner Model) was used as validation test and reliability test, while the structural model (Outer Model) is used as causality test (hypothesis test with prediction models).

3.4 Research Instruments and Measurements

The measurement of this research used Likert (2005) that scales ranging from 1 = strongly disagree to 5 = strongly agree. Regarding the validity testing, this research used construct validity with confirmatory factor analysis testing. This was done by using a correlation technique Pearson Product Moment that Analyze-Correlate-Bivariate-Person, using two tailed with 5% significancy, N=10, and r table=0.497. Table 3.4 presents the validity testing results of the research instruments.

Table 3.4
Results of research instruments

| Item | R Adjustment | Explanation |
|------|--------------|-------------|
| X1.1 | 0.688 | valid |
| X1.2 | 0.663 | valid |
| X1.3 | 0.666 | valid |
| X1.4 | 0.663 | valid |
| X1.5 | 0.663 | valid |
| X2.1 | 0.771 | valid |
| X2.2 | 0.910 | valid |
| X2.3 | 0.935 | valid |

| | | |
|------|-------|-------|
| X2.4 | 0.779 | valid |
| Y.1 | 0.935 | valid |
| Y.2 | 0.758 | valid |
| Y.3 | 0.900 | valid |
| Y.4 | 0.803 | valid |
| Y.5 | 0.822 | valid |

Source: Primary Data, processed in April 2019

4. Data Analysis and Result

1. Outer Model

4.1. Convergent Validity

The convergent validity test for reflective indicators can be seen from the recommended loading factor value that is greater than 0.70. This means that the correlation between indicators and variables with a loading factor value of more than 0.70 can be included in the subsequent analysis. Although according to the research of developing scale, loading range 0.50–0.60 still acceptable (Ghozali, 2006), the current research set the value at 0.70. Table 4.1 below is the Outer Model after estimation, presenting the convergent validity of the AI, digital marketing and consumer buying intention.

Table 4.1
Convergent Validity

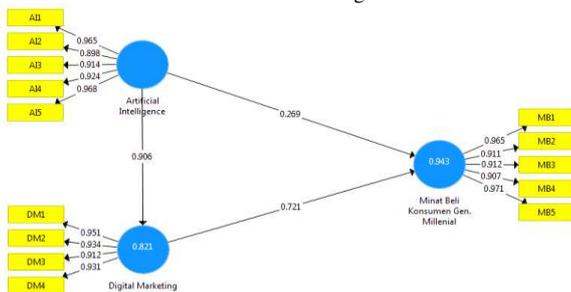
| Constructs | Items | Outer Loadings |
|-------------------------------|-------------------------|----------------|
| Artificial Intelligence (X1) | Expert System | X1.1 0.965 |
| | Natural Language System | X1.2 0.898 |
| | Robotics and Sensoric | X1.3 0.914 |
| | Computer Vision | X1.4 0.924 |
| | Intelligent Computer | X1.5 0.968 |
| Marketing Digital (x2) | Website | X3.1 0.951 |
| | Social Media | X3.2 0.934 |
| | Email | X3.3 0.912 |
| | Adwords | X3.4 0.931 |
| Customer Buying Intention (Y) | Attention | Y.1 0.965 |
| | Consumer's Interest | Y.2 0.911 |
| | Sense of Belonging | Y.3 0.912 |
| | Final Action | Y.4 0.907 |
| | Decision | Y.5 0.971 |

Source: Primary Data, processed in April 2019

The analysis shows that some indicators have a loading factor value of less than 0.70, so they must be eliminated. The following Figure 4.1 is the result of Outer Loadings after re-estimation:

Figure 4.1

The Result of Outer Loadings after Re-estimation



Source: Primary Data, processed in April 2019

Based on the picture above, it can be seen that after re-estimation by eliminating indicators of variables that did not meet the criteria with the value of outer loadings below 0.70, some of the remaining variable indicators experienced changes in factor loading values.

4.2. Discriminant Validity

In this study, discriminant validity was completed by comparing the square root value of Average Variance Extracted (AVE) of each construct and a correlation between constructs and other constructs (among other latent variables). Correlation between indicators is considered valid if the square root value of AVE is greater than 0.50. The correlation among the latent variables is presented in table 4.2

Table 4.2

The Square Roots Value of AVE

| Constructs | AVE |
|------------|-------|
| X1 | 0.873 |
| X2 | 0.869 |
| Y | 0.871 |

Source: Primary data, processed in April 2019

4.3. Composite Reliability

Reliability test in this research was conducted by using composite reliability. A variable can be said reliable if the composite reliability value is above 0.70. Table 4.3. below presents the results of the composite reliability test:

Table 4.3
Composite Reliability

| Constructs | Composite Reliability |
|------------|-----------------------|
| X1 | 0.972 |
| X2 | 0.964 |
| Y | 0.971 |

Source: Primary data, processed in April 2019

4.4 Inner Model

Evaluation of the structural model (Inner Model) was performed to see the relationship between variables, significance values and R-Square of the research model. Model assessment began by looking at R-Square for each endogenous variable, which in this study consisted of consumer purchase intentions (Y) and perceived value (Z) variables. Table 4.4 below presents the values of R-Square and the adjusted R-Square:

Table 4.4
R-Square and adjusted R-Square

| Constructs | R-Square |
|------------|----------|
| Y | 0.821 |
| Z | 0.5943 |

Source: Primary data, processed in April 2019

Based on the table above, it can be seen that the R-square value for the consumer buying intention variable is 0.943, which means 94.3% of the variance of consumer buying intention is influenced by AI. Whereas, for the variable digital marketing as a mediator in this study it has an Adjusted R-square value of 0.821, which means that 82.1% of the digital marketing variance is influenced by AI.

4.5 Final Results

The significance of the estimated parameters provides very useful information about the relationship between research variables. The basis used in testing a hypothesis is the value of the output path coefficient, i.e. Original Sample, STDEV, T-Values, P-Values. In PLS, statistical testing of each hypothesized relationship is carried out using a simulation. In this case, the bootstrap method was applied to the sample, that was by bootstrapping calculation to test the hypothesis. This bootstrap test was also intended to minimize research abnormalities. The following Table 5.1 presents the result of bootstrapping calculations for hypothesis testing:

Table 5.1
Results of Hypothesis Test

| Hypothesis | Coefficient | STDEV | T Statistics | P Value | Conclusion |
|---|-------------|-------|--------------|---------|--------------------------|
| Artificial Intelligence-> Digital Marketing | 0.906 | 0.039 | 23.053 | 0.000 | Positive and Significant |
| Artificial Intelligence-> Customer Buying Intention | 0.269 | 0.108 | 2.478 | 0,014 | Positive and Significant |
| Digital Marketing-> Customer Buying Intention | 0.721 | 0.108 | 6.706 | 0.000 | Positive and Significant |

Hypothesis 1 states that AI has a positive effect on digital marketing. The test shows a path coefficient of 0.906 with t-statistics 23,053, which means that the value is greater than t-table value (1,992) with a significance level of 5%. This result means that AI has a positive and significant relation with digital marketing. Hypothesis 2 states that AI has a positive effect on the millennials' interest, and the test shows the value of the path coefficient of 0.269 with the value t-statistics 2.478, which means that the value is greater than t-table (1.992) with a significance level 5%. This result means that AI has a positive and significant impact on to the millennials. Hypothesis 3 states that digital marketing has a positive effect on millennials' buying interests and the test shows the path coefficient value of 0.721 with the value t-statistics 6.706, which means that the value is greater than the t-table (1.992) with 5% significance level. This result means that digital marketing has a positive and significant impacts on the millennials' buying interests.

5. Discussion

Based on the results of the analysis, it can be seen that AI (X1) variable which is indicated from the use of expert system, natural language system, computer vision, and intelligent computer has a positive and significant effect on customer buying intentions (Y). This can be seen from the value of t-statistics which is greater than the value limit in the t-table (1.960) with a significant level of 5%, which is equal to 2.478. Thus, hypotesis 1 in this study was accepted. Moreover, McKinsey Global Institute States that AI technology is about to contribute 1,2% of annual Gross Domestic Product (GDP) for the next 10 years. AI technology can provide USD 13 trillion for the Global Economic Market by 2030 (McKinsey, 2019)

Based on the results of the analysis, it can be seen that AI (X1) variable also has a positive and significant effect on digital marketing (X2). This can be seen from the value of t-statistics which is greater than the value limit in the t-table (1.960) with a significant level of 5%, which is equal to 23.053. Thus, hypothesis 2 in this study was accepted. This research is in line with research by Sterne (2017), which found that the greater the data, the greater customer's history of interaction. AI captures users' interests, so industries makes a product that is in line with customers' needs (Chard, 2018).

Based on the results of the analysis, it can be seen that digital marketing (X2) variable as indicated by website, social media, email, and adwords has a positive and significant effect on customer buying intentions (Z). This can be seen from the value of t-statistics which is greater than the value limit in the t-table (1.960) with a significant level of 5%, which is equal to 6.706. Thus, hypotesis 3 in this study was accepted. Smith's research in 2011 found the same results, stating that the higher

the use of digital media by consumers, the easier companies reach the target market.

6. Conclutions and Suggestions

6.1. Conclusions

The results from the data analysis considered all of 3 proposed hypotheses and answered the key research questions. In general, respondents were helped by AI and digital marketing of the online transportation. AI, which is characterized by expert system, natural language system, computer vision, and intelligent computer has a positive and significant effects on customer buying intention (H1) and digital marketing (H2); and that digital marketing which includes website, social media, email, and adwords has a positive and significant effects on customer buying intention (H3). Robotica and sensoric AI have been found as the most significant factor to influence customer buying intention. Email in digital marketing has the lowest influence, but still significant. Hopefully online transportation (Gojek) finds a solution to improve their service, for example by strengthening the email verification for the new member.

6.2. Managerial Implications

Patterson (2018) stated that the AI-based robotic in service can be followed up and expanded in more sectors especially in serving industries. In addition, the latest data from the McKinsey Global Institute shows that AI technology is estimated to contribute 1.2% of annual gross domestic product for the next 10 years. McKinsey explained in a CNBC on Thursday (6/9/2018), AI technology can provide USD 13 trillion for the global economy market by 2030. "Without artificial intelligence, any country might face challenges to

reach its target growth rate.” Practical implication is for scholars so that they could develop a theory and better method. This research could be a reference to innovating and expanding this topic. Furthermore, this could give a base knowledge to similar research, and hopefully to fix the issues.

6.3. Limitation and Future Research

The current research is limited to the customer buying intention and did not continue to buying decision. Future research should head to this direction and include other factors that support artificial intelligence.

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Availability of data and material

The empirical results of the artificial intelligence and digital marketing's impact on intention to use online transportation are not publicly available because many respondents requested that the author does not publish their identity in this study. However, all data sets (especially detail characteristics, data of respondents) are available from the corresponding author on reasonable request.

Competing interests

The authors declare that there is no competing interests regarding this article

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Authors contributions

The main contribution of the study, despite the fact that there are some limitations in this research. Authors expect that the study contributes to the current literature to some extent in several areas, especially for the companies that had marketing section and having customers, in order to maintain the quality marketing the products or services and to keep updated adopting artificial intelligence and digital marketing based on the recent technology in the world. The unique contributions of the study: previous study usually focuses on the artificial intelligence in the electro study kind of robots, or the influence of human resources for the future. Authors tried to connected the artificial intelligence and digital marketing in the economics, especially in the marketing views. The study that the author conducted is still rare in the context of Indonesia. The authors read and approved the final manuscript.

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Figures

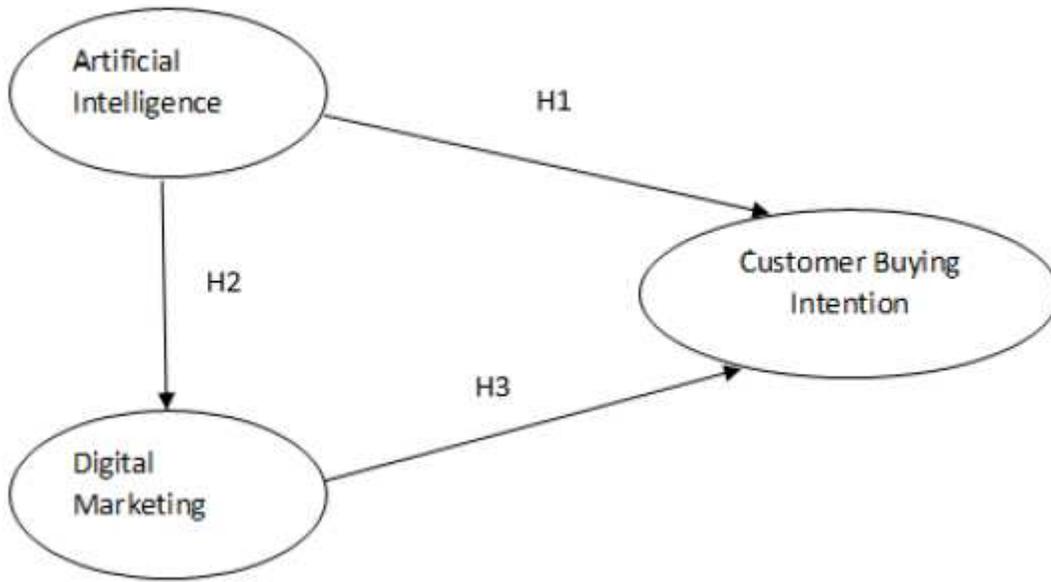
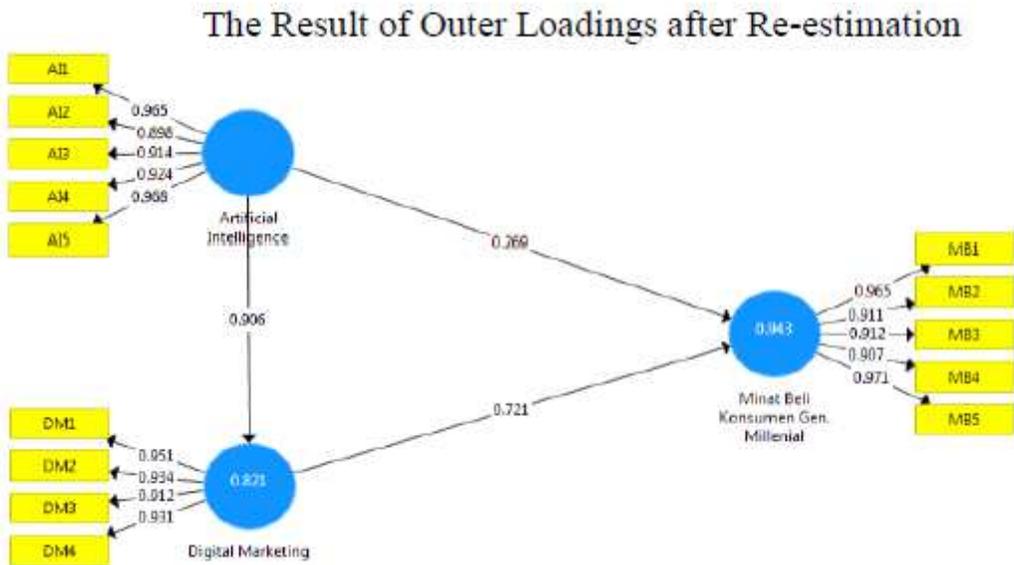


Figure 1

Research Conceptual Framework.



Source: Primary Data, processed in April 2019

Figure 2

The Result of Outer Loadings after Re-estimation (labeled as "Figure 4.1" in manuscript file).