Examining generation X experiences on using e-commerce: integrating the technology acceptance model and perceived risks

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Abstract. The electronic-commerce (e-commerce) has become an important platform for conducting business. While information researchers and market practitioners are trying to fully understand online consumer attitude and behavior, there is a research call on investigating users’ behavior on using online shopping based on the generational differences. This research is mainly about examining Generation X on using e-commerce. The research aims to examine the Generation X’ perceptions and experiences towards e-commerce based on the Technology Acceptance Model (TAM) and perceived risks. Based on the perceived risks and the Technology Acceptance Model, this study collected data and interviewed generation X respondents. The results indicate that the generation X’ perceptions were positive in term of the usefulness and the ease of use of e-commerce. In addition, the challenge for Generation X to shop online was related to the risks such as product risks, security and privacy risks, financial risks, and delivery risks. This paper also offers managerial implications and suggestions for future research.

1. Introduction

Electronic-commerce (e-commerce) nowadays has become an important platform for conducting business. Research shows that the commercial trade development through the Internet has astonishingly transformed the retail industry since 1990 [1] due to the usage of the Internet in the contemporary era as a means of transaction for consumers in the global market [2]. While researchers and market practitioners are trying to fully understand online consumer attitude and behavior, one of the current issues in the management of information technologies is the difficulty of recognizing significant factors that affect consumers to adopt the information technologies, especially e-commerce. A model that commonly used by the information researchers to examine behavior in the information system field is the Technology Acceptance Model (TAM).

The Technology Acceptance Model is based on the Theory of Reasoned Action (TRA) and theory of planned behavior that seeks to explain behavior intention to use information system [3]. This model has been widely used by information system researchers because of its understandability and simplicity [4], although the model also has drawbacks. For instance, [5] noted that findings of TAM relationships are not borne out in all studies, and there remains a wide variation of predicted effects in various studies with different types of users and systems. As a result, there are some modified or extended models that have been developed to fully understand the information system adoption, for example the unified theory of acceptance and use of technology (UTAUT) model [6].
Over decades, information researchers have closely examined factors that affect information system adoption. However, little is known about the acceptance of online shopping and the factors which influence this behavior in the developing countries, in particular based on the generational differences approach. This study attempts to fill in this gap by providing insights on how Generation X group, those born between 1965 and 1981 [7], experiences their online shopping behavior. Following the technology acceptance model modification, in this study, we apply the extension of the TAM for its application in the e-commerce field. The original variables of technology acceptance model will be modified by adding perceived risk.

We began by reviewing theories and previous research relevant to the Technology Acceptance Model. Once explaining the research methodology, we explained the results section and the discussion of the result. As a final point, research implication and suggestion for future research are also discussed.

2. Literature Review
Recently, e-commerce has been rapidly developing. Fast development of the Internet has made the e-commerce an essential and effective platform for commercial transactions. By definition, e-commerce is described like to make production, presentation, selling, insurance, distribution and payment transactions of the goods and services in the electronic domain [8]. Although e-commerce has been a vital issue, there are still few empirical studies to investigate online consumer behavior, in particular if it is related to the generational differences; Baby Boomers; Generation X, Generation Y, or Generation Z.

In this study, we mainly focus on the Business to Customer (B2C) e-commerce platform, where companies provide the goods or services in the Internet directly and offer sufficient information and convenient interface to attract consumers to buy online in order to eliminate channel intermediaries [9]. E-commerce is growing rapidly in Indonesia. Bhinneka.com became the pioneer for e-commerce platform in Indonesia. Several e-commerce platforms followed, such as Berniaga.com, TokoBagus.com (now it is olx.com), Tokopedia.com, Bukalapak.com, Blibli.com and the other sites [10].

The Technology Acceptance Model (TAM) is a common approach in information system research. Originally, the Technology Acceptance Model (TAM) was developed by [11], which purposely explains the computer usage behavior in order to predict technology acceptance, and how people adopt and accept new technology applications. The TAM suggests that beliefs in a technology are related to users’ attitudes and their decision to adopt the technology. In TAM, it is proposed that the perceived usefulness and perceived ease of use predict intention to use information technology which, in its turn, is believed to affect the adoption of technology. Further, TAM shows that perceived usefulness and perceived ease of use improves the users adoption of the technology.

There are some issues to be solved, however. On the one hand, the Internet technologies offers online consumers with additional way for finding information and buying of products and services. On the other hand, online consumers must deal with risks because of the nature of online shopping is virtual, where the consumers cannot feel, smell, and touch the reality of the products or services before they buy what they need [12]. In addition, the consumers may concern about the safety, the privacy, and the security of information transmission (such as personal data, credit card information) when they want to purchase the products and services. In other words, they are worried about the financial risks and the product risks [13] [14]. In conclusion, perceived risks are a vital aspect should be taken into account on the e-commerce adoption.

3. Methods
The purpose of the research is to examine the Generation X’s acceptance and experiences on using e-commerce. The respondents were selected by the following criteria; firstly, they were Generation X, people who born between 1965 and 1981, and secondly they have at least twice an online purchase
experience via Bukalapak, Lazada, Blibli, Shopee, Zalora, Tokopedia, OLX and the other sites of e-commerce.

Moreover, we used online questionnaire to obtain the data from the respondents. Then they were contacted to make an appointment for interview. The questionnaire was filled out by 95 respondents, of which 89 questionnaires were completed seriously; these were processed for further analysis.

The respondents have been questioned to fill out four parts in the questionnaire with related to personal information, the perceived usefulness, perceived ease of use, perceived risks. Examples items regarding the scales are; for perceived usefulness (4 items) are I am able to accomplish my shopping goals more quickly when I shop online, I am able to improve my shopping performance when I shop online (e.g. save time or money), I am able to increase my shopping effectiveness when I shop online (e.g. get the best deal or find the most information about a product), I find the website of online retailers useful in aiding my purchase decisions; for perceived ease of use (3 items) are I find most online shopping sites easy to use, I find it easy learning to use most online shopping sites, I find it easy to use most online shopping sites to find what I want; for perceived risks (5 items) are the product purchased may not perform as expected, I feel unsafe and insecure while shopping online, online shopping may cost more than traditional shopping, I feel it is difficult to find the right product online, the product ordered online may arrive in a damaged condition.

Those items were adopted and adapted from [15], [14], then translated into Bahasa Indonesia in order to be easier to understand. Those scales were measured by 1-5 Likert scales ranging from strongly disagree, disagree, neutral, agree to strongly agree.

4. Result and Discussion
The result describes the data and statistical findings based on the descriptive analysis. The following table shows the respondents’ descriptive statistic.

Table 1. The Respondents’ Descriptive Statistics

| Gender | Top E-Commerce | Devices |
|--------|----------------|---------|
| Male   | 42             | Tokopedia | 29 | Laptops | 37 |
| Female | 47             | Bukalapak | 25 | PCs | 26 |
|        | Lazada         | 17       | Mobiles | 20 |
|        | Other sites    | 18       | Tablets | 6 |
| Total  | 89             | Total    | 89 | Total | 89 |

From the Table 1, it shows that the number of male respondents is 42 people (47%), whereas the number of female respondents is 47 people (53%). Additionally, Tokopedia is the most popular e-commerce site visited by the respondents, followed by Bukalapak, Lazada, and the other sites. Most respondents use laptops to access e-commerce sites, followed by PCs, mobiles, and tablets.

Moreover, Table 2 below illustrates the group and the category by which will be used for descriptive analysis to categorize the average. The classification ranges from Very High (4.21 – 5.00) to Very Low (1.00 – 1.80).

Table 2. Group/Category for Assessment

| Classification | Category |
|----------------|----------|
| 4.21 – 5.00    | Very High |
| 3.41 – 4.20    | Above Average |
| 2.61 – 3.40    | Average |
| 1.81 – 2.60    | Below Average |
| 1.00 – 1.80    | Very Low |
After describing the criteria and the classification, the descriptive statistical analysis results will be explained from the data that has been answered by the respondents. Table 3 portrays the results of the descriptive analysis, in particular the perceived usefulness factors.

**Table 3. The Descriptive Statistic of Perceived Usefulness**

| Item                                | Strongly Agree (weight 5) | Agree (weight 4) | Neutral (weight 3) | Disagree (weight 2) | Weight x Frequency | Average |
|-------------------------------------|---------------------------|------------------|-------------------|--------------------|--------------------|---------|
| Accomplish shopping goals more quickly | 36                        | 31               | 20                | 2                  | 0                  | 368     | 4.13   |
| Improve shopping performance        | 39                        | 27               | 20                | 3                  | 0                  | 369     | 4.15   |
| Increase shopping effectiveness     | 40                        | 31               | 17                | 1                  | 0                  | 377     | 4.24   |
| Useful in making purchase decisions | 44                        | 29               | 14                | 2                  | 0                  | 382     | 4.29   |
| **Total Average**                   |                           |                  |                   |                    |                    | **4.20**|        |

The perceived usefulness was measured by four items. The descriptive analysis shows that the average of each item is classified on the fourth category; 3.41 – 4.20 and fifth category; 4.21 – 5.00. Overall, the total average is 4.20 which are classified on the *Above Average* category.

The descriptive statistical analysis from perceived usefulness shows that Generation X people find that e-commerce and online shopping sites is useful, meaning that these sites can help them to accomplish, improve and increase their shopping experiences as well as on making purchase decision.

Additionally, Table 4 below displays the descriptive statistical analysis from the perceived ease of use items.

**Table 4. The Descriptive Statistic of Perceived Ease of Use**

| Item                                | Strongly Agree (weight 5) | Agree (weight 4) | Neutral (weight 3) | Disagree (weight 2) | Weight x Frequency | Average |
|-------------------------------------|---------------------------|------------------|-------------------|--------------------|--------------------|---------|
| Online shopping sites easy to use   | 29                        | 27               | 30                | 3                  | 0                  | 349     | 3.92   |
| Easy learning to use online shopping sites | 33                        | 31               | 23                | 2                  | 0                  | 362     | 4.07   |
| Most online shopping sites easy to use | 27                        | 33               | 27                | 2                  | 0                  | 352     | 3.96   |
| **Total Average**                   |                           |                  |                   |                    |                    | **3.98**|        |

The perceived ease of use construct was measured by three items. The analysis shows that the average of each item is classified on the fourth category; 3.41 – 4.20. Overall, the total average is 3.98 which are classified on the *Above Average* category.

From the perceived ease of use perspective, Generation X people also think that e-commerce is ease to use. They feel that e-commerce and online shopping sites is not so difficult and complicated. It means that these sites can easily be learned.

**Table 5. The Descriptive Statistic of Perceived Risks**

| Item                                | Strongly Agree (weight 5) | Agree (weight 4) | Neutral (weight 3) | Disagree (weight 2) | Weight x Frequency | Average |
|-------------------------------------|---------------------------|------------------|-------------------|--------------------|--------------------|---------|
| The product may not perform as expected | 29                        | 25               | 33                | 2                  | 0                  | 348     | 3.91   |
| Feel insecure while shopping online | 33                        | 29               | 24                | 3                  | 0                  | 359     | 4.03   |
| May cost more than traditional shopping | 29                        | 32               | 26                | 2                  | 0                  | 355     | 3.99   |
| Difficult to find the right product online | 35                        | 23               | 29                | 2                  | 0                  | 358     | 4.02   |
| May arrive in a damaged condition   | 32                        | 31               | 23                | 3                  | 0                  | 359     | 4.03   |
| **Total Average**                   |                           |                  |                   |                    |                    | **4.00**|        |
Finally, the descriptive statistic of perceived risks is presented in Table 5. The perceived risks construct was measured by five items. The analysis shows that the average of each item is classified on the fourth category; 3.41 – 4.20. Overall, the total average is 4.00 which are classified on the Above Average category.

Some respondents also have been interviewed in order to obtain more understanding from their online purchase experiences. From the interview with them, most respondents explained that e-commerce platform is accommodating their shopping needs. There are a bunch of vendors and sellers who offer similar product and services, and thus many options that can be chosen before making purchase decision. They also mentioned that basically e-commerce sites are complementary of the traditional shopping because it cannot substitute the traditional shopping.

Moreover, the respondents also explained that they can easily learn how to use e-commerce sites. Most of the sites provide a clear procedure and instruction for online shoppers. When the respondents do not understand, they usually ask and look for someone who knows how to do online shopping in order to fully understand the process and the procedure. Although the instruction is clear and details, however, the respondents still thinks that there are risks in the online shopping. From the perceived risks, Generation X respondents described that there are some risks that make them afraid of. These risks are related to the quality of the product, the payment systems and procedures, costly, and the risks of the delivery system which may be delayed and not on time.

5. Conclusion
The research aims to examine the Generation X’ perceptions and experiences towards e-commerce based on the Technology Acceptance Model and perceived risks. Based on the data from the respondents, the data analysis indicates that Generation X have an above average level of adoption and using e-commerce sites. From the generational perspective, Generation X has successfully managed to adopt and use e-commerce sites, although they were born and grew up without the Internet and WWW sites.

However, the data analysis illustrates that the perceived risks level is relatively above the average. These risks, which may contain product risks, privacy and security risks, financial risks, time risks and delivery risks are very common risks due to the nature of online shopping. These risks would not make them skeptical towards online shopping, if e-commerce providers and the sellers assure that those risks have been minimized.

This research is aimed to aid the e-commerce providers as well as the online sellers to identify the perceived risks concerned by Generation X. Thus the concrete strategy in order to reduce the risks can be developed. Theoretically, this research contributes to the body of knowledge, particularly information system research, in understanding factors influencing e-commerce adoption.

There are some research limitations that should be underlined, however. First of all, the research measured and collected the data from a cross-sectional approach. The future research is suggested to measure and collect the data based on the longitudinal approach. Secondly, this research mainly focuses on a single generational group. Future research can take into account to compare the behavior of cross generational differences, as well as the gender difference which is not being investigated in this research. Finally, this research only shows the descriptive analysis. For future research, it is suggested to conduct a causal or associative research in order to assess the relationship and the effect of two variables or more.

6. References
[1] S. Chen and T. Chang, “A descriptive model of online shopping process: some empirical results,” *Int. J. Serv. Ind. Manag.*, vol. 14, no. 5, pp. 556–569, 2003.
[2] N. Delafrooz, L. H. Paim, and A. Khatibi, “Understanding consumer’s Internet purchase intention in Malaysia,” vol. 5, no. 3, pp. 2837–2846, 2011.
[3] E. E. Grandón, S. Altobello, and P. P. Mykytyn, “Comparing theories to explain e-commerce
adoption,” *J. Bus. Res.*, vol. 64, no. 3, pp. 292–298, 2011.

[4] W. R. King and J. He, “A meta-analysis of the technology acceptance model,” *Inf. Manag.*, vol. 43, pp. 740–755, 2006.

[5] W. M. Lim and D. H. Ting, “E-shopping : an Analysis of the Technology Acceptance Model,” *Mod. Appl. Sci.*, vol. 6, no. 4, pp. 49–62, 2014.

[6] V. Venkatesh, J. Y. L. Thong, and X. Xu, “Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology,” *MIS Q.*, vol. 36, no. 1, pp. 157–178, 2012.

[7] J. M. Twenge, S. M. Campbell, B. J. Hoffman, and C. E. Lance, “Generational Differences in Work Values : Leisure and Extrinsic Values Increasing , Social and Intrinsic Values Decreasing.” 2010.

[8] H. E. Çelik and V. Yilmaz, “Extending the Technology Acceptance Model for Adoption of E-Shopping by Consumers in Turkey,” *J. Electron. Commer. Res.*, vol. 12, no. 2, pp. 152–164, 2011.

[9] M. Luthfihadi and W. Dhewanto, “Technology Acceptance of E-commerce in Indonesia,” *Int. J. Eng. Manag.*, vol. 3, pp. 9–18, 2013.

[10] N. D. Widjaja and A. Tedjawardja, “A Preliminary Study of Merchants ‘ Intention to Adopt Online Payment Gateway in Indonesia,” *Int. J. Futur. Comput. Commun.*, vol. 1, no. 2, pp. 155–159, 2012.

[11] F. D. Davis, “Perceived usefulness, perceived ease of use, and user acceptance of Information Technology,” *MIS Q.*, vol. 13, no. 3, pp. 319–340, 1989.

[12] E. Y. Masoud, “The Effect of Perceived Risk on Online Shopping in Jordan,” vol. 5, no. 6, pp. 76–88, 2013.

[13] A. Bhatnagar, S. Misra, and H. R. Rao, “On risk , convenience , and Internet shopping behavior,” *Commun. ACM*, vol. 43, no. 11, pp. 98–105, 2000.

[14] L. C. Ying, L. L. Chie, N. J. Ze, T. H. Yee, and W. N. Y. Yeng, “Barriers to Online Shopping among Generation X: A Malaysian Perspective,” Universiti Tunku Abdul Rahman, 2016.

[15] P. Sun, R. J. Tsai, G. Finger, and Y. Chen, “What drives a successful e-Learning ? An empirical investigation of the critical factors influencing learner satisfaction,” vol. 50, pp. 1183–1202, 2008.