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Available online at www.sciencedirect.com ScienceDirect Procedia Computer Science 197 (2022) 403–409 Sixth Information Systems International Conference (ISICO 2021) Purchase intention and behavioural use of freemium mobile games during Covid-19 outbreak in Indonesia Rizshad Abdillah Ericska, Liza Agustina Maureen Nelloh*, Sasotya Pratama
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Abstract Purchase intention and behavioural use of UTAUT model has been used widely but still limited to be tested during the Covid-19 in Indonesia. This study presents UTAUT Model for the freemium mobile games in

Indonesia during the pandemic. A survey of SEM-PLS toward 100 Indonesian mobile game players was conducted to analyze Performance Expectancy, Effort Expectancy, and Social Influence as the antecedents of purchase intention and behavioural use for the freemium business model in Indonesia. Surprisingly, the social effect does not significantly influence the Purchase Intention, but others have shown their significant effects on purchase intention and behavioural use. © 2021 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by-nc-nd/4.0) Peer-review under responsibility of the scientific committee of the Sixth Information Systems International Conference. Keywords: Freemium mobile games; performance expectancy; effort expectancy; social influence; purchase intention; behavioural use; Covid-19 outbreak 1. Introduction The current pandemic of Covid-19 is believed to be one of the initial factors to bring increased attention to the mobile games industry. According to statista.com, since the beginning of the Covid-19 outbreak in 2020, the time spent on gaming activities were significantly increased up to 52 percent worldwide [1]. Gaming during the outbreak could bring happiness and felt less isolated, especially for multiplayer gamers [1]. Multiplayer games nowadays provide features such as freemium that made curiosity among players. Freemium business can be described as a product to be free at first but can be charged additionally for premium products or services and can be seen in the form * Corresponding author. Tel.: +221 797 8888; fax: +6221 7970509. E-mail address: liza.nelloh@ipmi.ac.id 1877-0509 © 2021 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (https://creativecommons.org/licenses/by-nc-nd/4.0) Peer-review under responsibility of the scientific committee of the Sixth Information Systems International Conference. 10.1016/j.procs.2021.12.156 of music, magazines, social networks, cloud services, pertinently to games [2]. Freemium is a type of business model where customers are provided with basic services for free but there are additional costs if the customer subscribes to premium features. This business model is becoming very popular in today's digital platforms, many large companies are using this model as part of their business models. Examples include YouTube, Spotify, and the like. They provide the same basic services to all users without charging them any fees. However, if any user wants to get a service or product that is not included in the basic product, he/she must subscribe to premium features by paying a certain fee [3]. The growth of the mobile game industry with a freemium business model in Indonesia has given impetus to the increasing number of mobile game players in Indonesia who are willing to spend money to get the features available in freemium online mobile games. The market for mobile games grew more and worth $68.5 billion in 2019 which in itself acquainted 45% towards global market share of video games which is more than what the pc and console games contributed in 2019 [4]. Based on Newzoo, a market research company for games and electronic sports stated that Indonesia has 62.1 million game players in Indonesia and reaches US$1.1 Billion of income to this industry. Hence, the performance made Indonesia became the largest users of gamers in Southeast Asia, and ranked of 12th of number of players in the world [4]. Due to Covid1-9 pandemic, the number of gamers raised to 77% of the total population [5]. Even so, the number of freemium users were quite small (only 2.2%) of the gamers and became a serious matter for the game developers in Indonesia [6]. To address this matter, the Unified Theory of Acceptance and Use of Technology (UTAUT Model) [7] has been tested in many settings including freemium business in Indonesia (e.g. [6][8]). The lack of those studies was not conducted during the Covid-19 outbreak whereby the number of mobile gamers has been significantly increased. Hence, this research was conducted during the covid-19 in Indonesia, to determine the main factors that influence purchase intention and behavioral use in freemium online

mobile games. The data needed was taken by surveying Indonesian mobile game players to identify the relationship between several factors related to the UTAUT model such as Performance Expectancy, Effort Expectancy, and Social Influence [7]. 2. Conceptual model and hypotheses development 2.1. UTAUT model UTAUT theory explores the acceptance and use of technology in society, many previous studies have been conducted using the UTAUT model with the main topics related to technology. Despite there are various topics that can be related to the UTAUT model, for the purposes of this study several previous studies will be used as references and examples of the use of the UTAUT theory model. The technology that has been studied in previous studies and in this study will be directed at mobile technology, especially mobile devices such as smartphones, tablets, and others [7][9][10][11]. 2.2. Hypotheses development The relationship between Self-Efficacy, Social Influence, Performance Expectations, Effort Expectations, and Behavioral Intention in Mobile Learning Services is proven [10] [11]. While the journal discusses the relationship between performance expectations and behavioral intentions, other journals that examine the relationship between performance expectations, business expectations, and behavioral intentions for purchase intentions are focused on video games [7] [9]. Therefore, there is a positive influence on the social influence of purchasing online freemium mobile games for Indonesian players on purchase intentions. This hypothesis was used in previous studies with different contexts of user adoption rather than behavioral intentions [9]. The behavior of using online mobile games has a positive relationship with Indonesian players when their behavioral intention in buying online freemium mobile games, which links purchase intention and usage behavior, has also been tested in previous studies which also explored the topic of mobile games [7] [9][10][11][12][13]. Therefore, the following hypothesis are formulated H1: Performance expectancy has a significant and positive effect toward purchase intention freemium online mobile games H2: Effort Expectancy has significant and positive effect toward purchase intention freemium online mobile games H3: Social Influence has significant and positive effect toward purchase intention freemium online mobile games. H4: Behavioural Use of online mobile game freemium has positively related to users Purchase Intention Performance Expectancy H1 Effort H4 Behavioural Expectancy Purchase H2 Intention Use H3 Social Influence Fig. 1. Research model. 3. Methodology 3.1. Data collection and sample Ghozali stated that to test the PLS model, 30-100 respondents should be obtained [14]. Therefore, a purposive sampling approach is applied toward 100 mobile game players in Indonesia who have played online mobile games for at least 10 hours in the past week, spent at least IDR 75,000 in online mobile games, and have played online mobile games at least 2 games in the past. Therefore, from the demographic information of respondents that has been collected, there are younger generations who already have their own income, and some are still dependent on their parents for their lives. Apart from that, they also have moderate playtime, while being able to manage 2-5 types of games played and being able to buy a decent amount of freemium currency. Therefore, it can be said that Indonesian players are trying hard to improve their performance in online mobile games for various reasons such as the number of games they have to play, how they manage their playing time in each game they have, and others. 3.2. Measurement This study employed Partial Least Square (PLS) method of analysis. To pursue the analysis, the outer model and inner model is required in prior to the hypothesis testing [15]. The outer model is to test validity of the indicators. Namely, to determine the relationship between latent variables and other indicators in the theoretical framework. This study employs a five-Likert scale and as a requirement for the outer PLS model, this study examines the loading factor and Average Variance Extracted (to test convergent validity), internal composite reliability (to test reliability), and tests cross-loading to test discriminant validity [15]. The outer model

results can be seen on Table 2 and meet the requirements of PLS [14] [15]. 3.3. Goodness of fit index The model's Goodness-of-Fit index (GoF) will be assessed by determining the geometric mean of the two types of R2 mean values such as the mean of communality and the mean of R2 of the endogenous latent variables [15]. The formula for measuring GoF will be seen Eq. (1) as follows: $Q2 = 1 - (1 - R1^2) (1 - R2^2) ... (1- Rp^2)$ (1) Thus, there are three GoF index classifications, namely small (0.1 <GoF = 0.25); medium (0.25 <GoF = 0.36), and large (GoF> 0.36) [10]. The Q2 of this study is 0.7426, so it can be concluded that this study contains a large Goodness of Fit index and is recognized as valid in the PLS model globally [16]. 4. Analysis This study uses Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS Ver. 3 as an analysis tool. Table 1, Table 2, Fig. 2, and Fig. 3 presents the PLS-SEM results. The results showed that the value of each variable has a value greater than 0.7. Therefore, the data showed good values of Composite Reliability (CR). Therefore, this study presents good values of AVE in each variables (AVE > 0.5). In other words, the indicators of the study passes SEM-PLS requirement of validity and reliability [15]. An adjusted R-square value that shows a coefficient of determination of purchase intention of 48.4%. This means 48.4% of purchase intention are explained by performance expectations, business expectations, and social influences. Meanwhile, the remaining 51.6% are explained by other variables that have not mentioned in the analysis model. Hence, the coefficient of determination of behavioral use contains of 48.6%. This means behavioral use is explained by purchase intention but other 51.4% would be explained by other factors (outside from the study). In the theoretical model each variable represented by a blue circle has three indicators each. Like Performance Expectancy which consists of three different indicators that show different aspects of Performance Expectancy, such as PE1 (Performance Expectancy) showing Productivity when playing online mobile games, PE2 (Performance Expectancy) shows an increase in the performance of Indonesian players on mobile online games, and PE3 (Performance Expectations) demonstrate the usefulness of freemium currency in online mobile gaming. This extends to each variable in the model with different variables containing various types of indicators that are appropriate in the application of this study. Table 1. Validity and reliability testing on items. Variables Performance Expectancy Effort Expectancy Social Influence Purchase Intention Indicators Gaming productivity Gaming performance Useful activity of gaming Easy to use Easier to access the features Easy to operate Random people ask to join freemium Ignafmlueential people to use freemium game The community of mobile games Intent Willingness Planning Standardized loading factor 0.809 0.779 0.582 0.727 0.784 0.714 0.806 0.743 0.676 0.738 0.872 0.716 Composite Average Variance Reliability (CR) Extracted (AVE) 0.786 0.534 0.771 0.551 0.820 0.552 0.786 0.606 Behavioural Use Currently active user Frequently user Exploring 0.613 0.846 0.804 0.802 0.579 Furthermore, the results of the hypotheses testing using SEM-PLS with SmartPLS Ver. 3 present that H1, H2 and H4 are accepted (T-Statistics >1.96; P-values <0.05), but H3 is surprisingly rejected (below the requirement of T- statistics and P-values). Based on Table 2, the significant antecedents of purchase intention of freemium mobile games are performance expectancy and effort expectancy [9][10][11][12][13] during the Covid-19 outbreak. In contrary, social influence is not significant on purchase intention due to some reasons (e.g. activities from home) [1]. Table 2. Statistical result on structural model. Hypothesis Original T-Statistic P Value Notes Sample H1: Performance expectancy has significant and positive effect toward purchase intention freemium online mobile games H2: Effort Expectancy has significant and positive effect toward purchase intention freemium online mobile games H3: Social Influence has significant and positive effect toward purchase intention freemium online mobile games H4: Behavioural Use of online mobile game freemium has

positively related to users Purchase Intention 0.380 3.080 0.331 4.206 0.094 0.770 0.701 14.159 0 0.002 0.442 0 Supported Supported Not Supported Supported * Significant level of p=0.05 (T-statistics > 1.96) Fig. 2. Structural model with coefficient. Fig. 3. Structural model with T-values. 5. Conclusion, implications, and further study This study proposed the implication of basic UTAUT Model in Freemium mobile games during the Covid-19 Outbreak in Indonesia. In conclusion, among four hypotheses proposed, social influence is not significant toward purchase intention. Online activities at home restricted social interaction that might cause the result of the rejected H3. Meanwhile, Performance Expectancy, Effort Expectancy has positive and significant influences on Purchase Intention of Indonesian online mobile game players when buying premium during the Covid-19 outbreak. Therefore, Purchase Intention has a positive and significant effect on Behavioral use of Indonesian online mobile game players. Hence, the study brought significant results and implications for game developers during the Covid-19 outbreak. As the theoretical implications, UTAUT Model can be implemented in the freemium mobile games especially performance expectancy and effort expectancy. Performance expectancy would be the most influential antecedent on the endogenous variable of purchase intention. However, since the social influence is not significant on purchase intention, the further study should reconfirm the relationship by using UTAUT 2 Model, especially during the Covid- 19 outbreak or after the Covid-19 outbreak. Therefore, the needs of the online game industry that is already present in Indonesia, based on this study video game companies can design their freemium strategy models effectively to suit the Indonesian market. This can be done with video game developers and publishers supporting their communities by knowing the behavior of players in Indonesia on how they will use the freemium currency which focuses on performance aspects and effort when they play online mobile games. based on there, publishers can serve their viewers in Indonesia to spend more money on their video games. As for the further study, this study suggests to implementing another UTAUT for fremium business in the future (e.g., adding more outcome mechanism as stated by Vankentesh). The outcome mechanism could be behavioural experiences and loyalty among mobile game players. References [1] Clement, J. (2021) "COVID-19 impact on the gaming industry worldwide - statistics & facts." [Online]. Available: from https://www.statista.com/topics/8016/covid-19-impact-on-the-gaming-industry-worldwide/ [2] Hamari, J., N. Hanner, and J. Koivisto. (2020) "Why pay premium in freemium services? A study on perceived value, continued use and purchase intentions in free-to-play games." International Journal of Information Management 51: 102040 [3] Segal, T. (2020) "What You Should Know About Freemiums." [Online] Available: https://www.investopedia.com/terms/f/freemium.asp [4] Newzoo (2019) "Insights into Indonesian Games Market." [Online]. Available: https://newzoo.com/insights/infographics/insights-into-the- indonesian-games-market/ [5] Evandio, A. (2020) "Masyarakat Indonesia Ternyata 77 Persen Pemain Gim." [Online]. Available: https://teknologi.bisnis.com/read/20201219/564/1333281/masyarakat-indonesia-ternyata-77-persen-pemain-gim [6] Purnami, L. D., and A. A. Agus. (2021) "The Effect of Perceived Value and Mobile Game Loyalty on In-App Purchase Intention in Mobile Game in Indonesia (Case Study: Mobile Legend and Love Nikki)." Marketing Journal: 9-19. [7] Venkatesh, Viswanath, Michael G. Morris, Gordon B. Davis, and Fred D. Davis. (2003) "User Acceptance of Information Technology: a Unified View. MIS Quarterly," 27 (3): 425. doi:10.2307/30036540 [8] Firdaus, Adzan Salman, and Raden Aswin Rahadi. (2021) "Conceptual Model for Factors that Influence Purchase Intention of In-game Purchase in Freemium Mobile Game." International Journal of Accounting 6 (32): 74-87. [9] Evans, E. (2016). "The economics of free. Convergence: The International Journal of Study into New Media Technologies." 22 (6): 563-580.

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