A Study of Intention to Play Online Mobile Games: The Case of Indonesian Online Mobile Gamers

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Abstract: *The online mobile games industry is one of the biggest in the recent era of the entertainment industry. Therefore, the competition in the industry is tough. The developers need to be able to attract as many users as possible. Consequently, understanding the most significant elements impacting the intention to play online mobile games is essential. The goal of this study is to find out what influences people's intention of playing online mobile games. 269 Indonesian gamers completed an online questionnaire. The data was analyzed using logistic regression. The result showed that perceived enjoyment was a significant predictor affecting Indonesian gamers' intention on playing online mobile games.*

Keywords: intention to play, logistic regression, online mobile games

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1. Introduction

Game industry is the biggest industry among the entertainment industries. In 2019, the revenue of the video games industry worldwide was astounding.

A report from Statista showed that the video games industry gained 83 billion US dollars. Statista also reported that the box office generated 42 billion US dollars. In comparison, recorded music generated 21 billion US dollars. It shows that the video game industry's revenue surpasses the other two entertainment industries, even if they are combined. (Watson, Global box office revenue from 2005 to 2019, 2020; Watson, Global recorded music revenue from 1999 to 2019, 2020; Statista, 2020).

In the past, game developers only relied on one source of income, namely the sale of physical games such as console games, distribution through cartridges, arcade games, and discs. With the development of technology, physical game sales migrated to the internet in digital sales (Epstein, 2015).

The development of communication and computational devices also provide an additional boost, where the technology is developing towards mobile. Now, computers are more portable, easier to use, and more capable than its predecessor. It gets to the point where today's phone can run past PC's or console's games.

Even more, today's phone or better known as smartphone is cheaper. So, it is easier for everyone to have a smartphone.

Statista predicted 2.9 billion smartphone users to continue rising (Statista, 2020). Thus, it will be easier for people to access video games via smartphones than before when the game was exclusively for computer and console owners.

A recent report from Statista showed the domination of smartphone games. The revenue is almost twice, compared with the personal computer games used to dominate the market for years. (Gough, 2020).

With the evolution of the internet, it went even further. It was a time when the video game industry has changed drastically—many new genres and new business models in the industry. In the 2000s, online games became one of the explosive trends and had dominated the game world (Marshall, 2019). According to a report written in 2019, the most popular platform for playing online video games is a mobile device (Limelight Network, 2019).

In July 2016, an online mobile game called Pokémon Go was released. It only took not more than a month before it generated more revenue than any other games, even apps, in Apple's Appstore and Google Play store. According to Guinness World Records, Pokémon Go gains at least $200 million in its first month. It was the highest of any mobile game. However, users did not have to pay for the game. All the revenue was derived from optional purchases people made as they played (Swatman, 2016).

This is the World of Freemium Apps, a business model that has eliminated the paid game market in recent years (Dredge, 2013).

Apart from optional in-app purchases, which are more popular for games with the genre of mid-core and strategy or advance games (such as Adventure, Simulation, Action, Role Playing, Strategy, Arcade, Racing). Revenue sources can also come from in-app advertisements. This model is popular in games with casual and hyper-casual genres (such as Puzzle, Card, Board, Word, Educational, Trivia), which have very simple mechanics (AppsFlyer, 2018).

Even this in-app purchase option existed earlier in the western video game industry; the Freemium business model grow more rapidly in the eastern video game industry (Williams, 2017; Upper Echelon LLC, 2019; Inside Gaming, 2017). Now the top leading revenue generator is in Asia-Pacific with 47.4% of the global market. Southeast Asia is one of the contributors (Newzoo, 2019). Indonesia, being the largest video game market in Southeast Asia and the 16th largest internationally, makes up the majority of its contribution (Newzoo, 2017).

As the fourth most smartphone user globally, Indonesia is home to online mobile gamers in Southeast Asia (Newzoo, 2020). Around 1000 local game developers were active in Indonesia in 2016, according to Andy Suryanto, Chairman of the Indonesian Game Association. Even though local game makers claim to control 50% of the market, international games continue to dominate (Indonesia Investments, 2016). Because of a variety of circumstances, most local games do not last more than five years. From that case, this raises the importance of carrying out this study, especially in Indonesia.

In that instance, with hundreds of thousands of competitors, mobile game developers are challenged to engage players over. Without ongoing usage, mobile games cannot be monetized properly, either from in-app purchases or in-app advertising. It implies a question about how mobile games can do better to attract and keep their players engaged. It will be interesting to

know the most critical factors that affect people's intention to play or continue playing online mobile game.

This study investigated the most critical factors that affect players' intention on playing online mobile games. The online mobile game here refers to any mobile games played on iOS or Android smartphones or tablets. However, this study focuses on the freemium business model.

As mentioned before, Indonesia sits as the biggest mobile market in Southeast Asia and 16th in the world, with a market value at $880 million (Newzoo, 2019). As a country with the most spending in Southeast Asia (Newzoo, 2017).

According to Newzoo, Indonesian has more than 43 million gamers in 2017 (Newzoo, 2017). With at least 45% of them play across mobile, PC, and console. However, the remaining population of online mobile gamers is still unknown, and the number keeps increasing. Therefore, the non-probability sampling technique was employed.

This research was conducted from January 2021 until March 2021. The result is representing the data that has been collected and analyzed within that period.

Understanding the underlying factors of players' intention is substantial for game developers. Primarily, game developers need players to play their game to survive in the business. Hence, the goal of this research is to identify the most important factors that influence players' intention of playing online mobile games. The goal of this study is to look at the game's experience aspects that influence the intention of playing.

2. Literature Review

Intention to Play
Individuals' intentions to play are influenced by their attitudes regarding the action and their subjective norms. According to Ajzen (Ajzen, 1991), In the idea of planned behavior, intentions capture the motivating elements that impact acts. They demonstrate how hard individuals are willing to attempt, how much effort they intend to put in while performing. In most situations, the stronger a person's intention to engage in an activity, the more likely it is that acts will be carried out.

Understanding the driving factors of the players' intention is a substantial interest. Because game developers, companies, sponsors, and operators can significantly benefit from it. Primarily, developers need many players to play their game to survive the tight competition video game industry.

Previous studies frequently mention flow, social interactions, subjective norms, trust, also perceived enjoyment, usefulness, and ease to use as the predictors. For this study, the frequently used predictors are the determinant of the players' intuition.

Flow
Flow is the state of concentration and involvement achieved when completing tasks that challenge one's skills (Csikszentmihalyi M. , 2008). Flow is the feeling that people get when they are completely immersed in their activity (Csikszentmihalyi M. , 1977). It is what gets players so absorb, so engaged, that they forget the world around them. It must be a pleasurable pastime with just the appropriate amount of challenges, a clear set of rules, specific goals and

outcomes, and easy yet rigorous practice. This tests one's abilities to the maximum, and one loses track of occurring as a consequence.

Social Interaction

Interaction refers to the act of interacting with two or more elements and enabling them to react (Laurel, 1993). A player can, for example, communicate with opponents, monsters, or other players by chatting to them, trading with them, assaulting them, or defending them (Choi & Kim, 2004). One of the critical interactions is social interaction.

Learning about others, assimilating with them, feeling a sense of belonging to a group or society, and connecting with family, friends, and society are ways that social interaction builds upon social empathy (McQuail, Mass communication theory: An introduction, 1983).

Sweetser and Wyeth (Sweetser & Wyeth, 2005) argue that social interaction can enhance game immersion. Lazzaro (Lazzaro, 2004) further stated that interacting with other people provided enjoyment to the participants. Pilke (Pilke, 2004) suggested that flow could occur as a result of interacting with technology.

Perceived Enjoyment

The term "perceived enjoyment" refers to an escape or distraction from people's everyday activities in the real world, as well as relaxation, emotional stress relief, instinctive entertainment, and pleasure (McQuail, Mass communication theory: An introduction, 1983; McQuail, Media performance: Mass communication and the public interest, 1992).

Apart from impact, enjoyment can also be defined as the degree to which performing an activity provides satisfaction and joy in its benefit (Davis, Bagozzi, & Warshaw, 1989; Venkatesh, 2000).

Because online games involve experience goods, and individuals play online games to have a pleasant experience, playing online games is mostly for amusement.

Related Studies

Prior studies have attempted to improve a better understanding of online game players' intentions. The following are those research that cover various aspects of players' intention to play online games.

Table 1: Summary of related studies on intention to play

Author(s)	Title	Attributes
Ming-Chi Lee (Lee, 2009)	Understanding the behavioral intention to play online games	Flow Interactions Perceived enjoyment Attitude Subjective norm Perceived behavioral control
Zeynep Erturkoglu Jing Zhang En Mao (Erturkoglu, Zhang, & Mao, 2015)	Pressing the Play Button: What Drives the Intention to Play Social Mobile Games?	Entertainment Social interactions Pass time Popularity Usability Trust

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Table 1: Summary of related studies on intention to play (continued)

Author(s)	Title	Attributes
Dong-Mo Koo (Koo, 2008)	The moderating role of locus of control on the links between experiential motives and intention to play online games	Concentration Enjoyment Escape Epistemic curiosity Social affiliation
Wahyu Rafdinal Agri Qisthi (Rafdinal & Qisthi, 2019)	In-Game Factors and Technology Acceptance Factors in Increasing Intention to Play Online Game	Perceived usefulness Perceived ease to use Game features Trust in game developer Subjective norm
Jiming Wu De Liu (Wu & Liu, 2014)	The effect of trust and enjoyment on intention to play online games	Trust in online game Online gaming enjoyment Subjective norm
Chin-Lung Hsu Hsi-Peng Lu (Hsu & Lu, 2004)	Why do people play on-line games? An extended TAM with social influences and flow experience	Flow Perceived usefulness Perceived ease to use Social norm Critical mass

An overview of past studies on the intention to play video games may be found in Table 1. Lee's research looks at the effects of flow, perceived enjoyment, and engagement on the intention to play online games. Lee (Lee, 2009) mentioned the technology acceptance concept and the theory of planned behavior. According to the findings, flow experience is the most important element in determining the intention of playing online games. He proposed that online games developers look for ways to create a flow experience that would help them attract gamers. Erturkoglu, Zhang, and Mao (Erturkoglu, Zhang, & Mao, 2015) looked at what motivates players to play online games and how they promote positive word of mouth about them. They conducted a study based on the theory of uses and gratifications being expanded. The findings revealed that perceived enjoyment, game popularity, usability, and trust all had a substantial impact on the intention to play and the spread of positive word of mouth. As for indicators of the intention to play online games, Koo (Koo, 2008) developed a model comprising five experience motivations. Concentration, enjoyment, escape, epistemic inquiry, and social attachment are among the five motivations. External locus of control was also included as a modulator of experiential reasons and intention to play online games. The findings indicated that enjoyment, escape, and social affiliation all influence the intention of playing online games. Rafdinal and Qisthi (Rafdinal & Qisthi, 2019) attempted to gain new insight into behavioral intention to play online games. Based on the theory of reasoned action, they proposed a theoretical model constructed by trust and enjoyment. The result showed that enjoyment significantly affects attitude, and attitude and subjective norms predict intention. The result also revealed that trust affects intention indirectly through attitude. The findings indicated that perceived utility, game features, trust, and subjective norm all had a major impact on how people felt about playing online games. Wu and Liu (Wu & Liu, 2014) wanted to learn more about how people decide whether or not to play online games. They developed a theoretical model built on trust and enjoyment, based on the theory of reasoned action. The findings revealed that pleasure has a substantial impact on attitude and that attitude and subjective norms predict intention. The findings also indicated that trust has an indirect effect on intention via attitude. Hsu and Lu (Hsu & Lu, 2004) Using the technological acceptance approach, Hsu and Liu sought to study people's intentions to play online games. The findings revealed that social norms, attitude, and flow experience all had an impact on the intention of playing online games. Several characteristics or features of intention to play online games were commonly addressed in these associated researches. Flow, social interaction, subjective norm,

trust, perceived enjoyment, perceived utility, and perceived ease of use are among the variables. As a result, these commonly utilized variables were employed as predictors of intention to play in this study.

In summary, factors that would be included in the research framework including flow, social interaction, perceived enjoyment, and trust, in experiential factors. For which would not be included such as subjective norm and perceived usefulness due to overlapping with other factors, for instance, perceived usefulness with perceived enjoyment, assuming the use of mobile games is to obtain the enjoyment. Lastly, perceived ease to use would be omitted considering mobile games are relatively easier than PC or console games as in the previous studies that focus investigating on PC games.

Research framework

After conducting a literature review on the intention to play and the potential underlying factors, the following is the research framework.

There are many different types of literature reviews, each with its own approach, analysis, and purpose. Through rigorous review and analysis of literature that meets specific criteria, the systematic review identifies and compares answers to health care related questions.
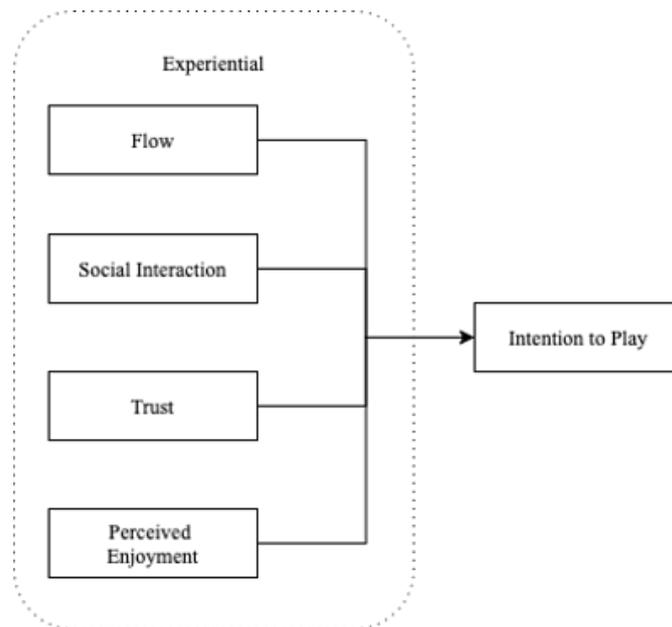

Figure 1: Research framework

The conceptual model has one dependent variable and independent variables. The dependent variable consists of the intention to play. Independent variables consist of experiential factors namely flow, social interaction, trust, and perceived enjoyment.

Following hypotheses proposed for this research:

Hypothesis 1	:	Flow has a significant relationship with intention to play online mobile games
Hypothesis 2	:	Social interaction has a significant relationship with intention to play online mobile games

Hypothesis 3   :   Trust has a significant relationship with intention to play online mobile games

Hypothesis 4   :   Perceived enjoyment has a significant relationship with intention to play online mobile games

3. Methodology

Indonesia is the biggest market for online mobile games in Southeast Asia. The competition among game developers became very tight. To be able to survive in this industry, developers need to maintain as many users as possible. As a result, it is critical to understand the most important elements that influence people's intention of playing online mobile games.

Quantitative research is frequently used to solve problems. The research focuses on identifying the most important elements that influence people's intention to play the game. Therefore, primary data will be necessary.

This study was consisted of three phases. The first phase is building up the theory by conducting a literature review as in Chapter II. To create a foundation and initial estimation model, determine the suitable method to analyze the data. The second phase is data collecting that includes preparing and conducting the survey. The third phase is analyzing the data and revisit the literature to conclude.

In quantitative research, employing a large quantity of literature at the start of a project to offer guidance for the research questions or hypotheses is not unusual (Creswell, 2014). The literature review presents an issue or provides a detailed description of the current literature. It also presents a hypothesis or an explanation for a predicted pattern or discusses the employed theory and offers another theory to investigate. Finally, the researcher compares the outcome to the predicted findings in the literature.

As mentioned above, this research used a deductive approach. This approach is ubiquitous in quantitative research. In the deductive approach, collecting theories that apply to related research precedes collecting data to prove the theory. In other words, this approach goes from general to specific. To identify the most critical factors affecting players' intention, previous studies that can support this research theory are necessary. Several related studies specifically investigate the influence of one or more factors on a person's perception of a game. Some of these studies are collected and summarized in Table 2 in Chapter 1. After a review of these studies is carried out, several factors influence players' intention to play. Some of them are frequently present in many studies. Those factors include flow, social interaction, trust, and perceived enjoyment are experiential factors. Eventually, one of the outcomes of this process is the proposed model.

At this phase, data collection was carried out. A questionnaire was utilized to gather the data in this research. This stage generated a developed questionnaire to determine the respondent's perception of the corresponding factors. The questionnaire was pretested first to ensure the smooth running of the survey. The pilot test was conducted on 50 students or employees at several universities and workplaces in Indonesia. This decision was made based on the assumption that the group could represent online mobile gamers who actively play between lectures or work hours.

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The last phase is the analysis. At this phase, the data that has been collected was analyzed using the regression method. Because the dependent variable is binary, the type of regression method that is used is the logistic regression.

Population
A report from 2017 said that the number of gamers in Indonesia is 43.7 million (Newzoo, 2017). With 45% of them play the game across mobile, PC, and console platforms. The population of online mobile gamers in Indonesia should be at least 19 million, excluding gamers who play only on the mobile device. However, the current population of online mobile gamers in Indonesia remains unknown. Due to time and resource constraints, it almost impossible to access all the population. In this case, it is necessary to sample the population using non-probability sampling. This sampling is commonly used for the sample with the unknown number of the population.

Sample
Following the non-probability sampling above, the accidental sampling technique was suitable for this research. However, there were some obstacles in the data collection process, such as impeded response and an unreachable population. To overcome this problem, a sampling technique other than accidental sampling was added, for instance, snowball sampling.

In this research, 312 samples were collected, however, not all respondents completed the questionnaire. From those samples, 269 were analyzed.

Data Collection
Data collection in this research was conducted using a Likert scale survey questionnaire. The Likert scale employed was a six-point scale that ranged from "strongly disagree" to "strongly agree." This choice was taken to decrease the amount of data that was obscure due to neutral points. With this adjustment, the respondent was forced to lean to one side of the perception.

The questionnaire in this research was an online form that was broadcasted through online platforms including social media and websites from January 2021 to March 2021. This online method is suitable for the target population that tends to be active in online society. Other than that, this method is more effective than the compared face to face or telephone method. Yet, this method has a significant disadvantage. For instance, it is hard to clarify questions and remedy the misunderstanding.

The required criteria for the respondent to be able to fill the questionnaire is that the respondent must be Indonesian and has, at least once, played an online mobile game.

Reliability
To the internal consistency of the questionnaire, reliability test was used as an indicator 15 item questions in the questionnaire attempted to measure flow, social interaction, trust, perceived enjoyment, social media, mass media, and influencer, showed acceptable reliability with Cronbach's alpha higher than 0.06 (Zikmund, Babin, Carr, & Griffin, 2009).

Model building
The model was constructed by choosing predictors that were not only significant but also improved the model's fit.

Table 1: The Wald significance test result

Predictor	Estimate	SE	Z	p
Intercept	-4.05812	0.645	-6.2934	< .001
Flow	0.04127	0.128	0.3229	0.747
Social Interaction	0.17652	0.125	1.4122	0.158
Trust	0.00573	0.144	0.0397	0.968
Perceived Enjoyment	0.79134	0.154	5.1360	< .001

From the table above, we can see the result of the Wald test. It showed that perceived enjoyment is statistically significant. Therefore, perceived enjoyment was a candidate for a predictor.

Other than significance, stepwise selection process was also employed to select potential predictors for the model. The outcome of the process generated a model with log likelihood value (-2LL) of 290.69.

Table 2: Model comparisons

Model	Residual Df	–2 Log Likelihood (–2LL)	Df	Deviance	Pr(>Chi)
Intention = Perceived Enjoyment	267	292.96			
Intention = Social Interaction + Perceived Enjoyment	266	290.69	1	2.2646	0.1324

After that, two model were compared using likelihood ratio test. The result of the test showed the significance value of 0.1324. This result revealed that the variable social interaction did not affect the model's goodness of fit. As a result, the experiential model's logistic regression model could be written as:

$$\text{Intention} = -3.715 + 0.913 \text{ Perceived enjoyment} + e$$

This equation could be interpreted as one point of increase in perceived enjoyment rating increase the odds of the intention on playing the game by 0.911.

Measures of goodness of fit
Before using the model for inferential purposes, it is required to assess the adequacy and fit this research, assessing the goodness of fit was conducted using the Hosmer-Lemeshow test, multicollinearity test, and the classification tables.

Table 3: Hosmer-Lemeshow test result

X-squared	Df	p-value
3.5434	8	0.8958

Hosmer-Lemeshow test was conducted to measure the goodness of fit of a model. Small p-value of the test mean that the model is a poor fit. The table above showed that the p-value was greater than 0.05, which mean that the model was a good fit (Hosmer, Lemeshow, & Sturdivant, 2013).

Table 4: Classification table

	Predicted		
Observed	**0**	**1**	**% Correct**
0	99	28	78.0
1	47	95	66.9

The classification table indicated the predictive accuracy of the model. The predictive value of the model showed the percentage of 78% and 66.9%. The 78% percentage could be interpreted as the accuracy of the model predicting the value of 0 in the intention to play variable, which mean the player does not have an intention to play. While the percentage 66.9% was the accuracy of the model in predicting the value of 1 in the intention to play, which mean the player has an intention to play the game in the future.

4. Result

Several tests were employed previously in the data analysis section to test the four hypotheses below:

Hypothesis 1: flow has a significant relationship with intention to play.

Based on the Wald test analysis, there was no statistical evidence that support the significance of flow.

Hypothesis 2: social interaction has a significant relationship with intention to play.

The Wald test analysis resulted that social interaction was not a significant predictor. However, social interaction did improve the log likelihood value of the model. Even so, based on the likelihood ratio test, the improvement was not significant.

Hypothesis 3: trust has a significant relationship with intention to play.

From the Wald test analysis, there was no statistical support of the relationship of trust and intention to play.

This also in line with the likelihood ratio test that revealed no significant difference between the model with and without trust as a predictor.

Hypothesis 4: perceived enjoyment has a significant relationship with the intention to play.

The Wald test analysis revealed that perceived enjoyment was significant. The likelihood ratio test, which indicated a substantial increase in the model's fit, backed up this claim.

5. Discussion and Conclusion

For developers, to be able to preserve as many players as possible is required to survive in the industry. Therefore, this research focus on studying the factors affecting intention to play online mobile games. The result of the hypotheses test will be discussed in this section.

Regarding hypothesis 1, there is no statistical support of significance of flow as a predictor based on the Wald test. As for the improvement in the goodness of fit, the existence of flow in the model did not give a significant improvement. Previous studies have shown different

results. (Lee, 2009) and (Hsu & Lu, 2004) showed that flow experience is the most important factor in influencing the intention to play. However, these studies were not focusing on online mobile games. The study from (Koo, 2008) showed that flow is not a significant predictor influencing intention to play. In this study, several factors may be contributed to the result, such as the demographic of the gamers, genre of the games, and the platform of the games. Particularly, the platform of the game, mobile games may trigger the flow experience less than any other platform.

The Wald test analysis for hypothesis 2 resulted that social interaction was not a significant predictor. However, social interaction did improve the log likelihood value of the experiential model. Even so, based on the likelihood ratio test, the improvement was not significant. Previous studies have shown mixed results. (Koo, 2008) showed that social interaction was a significant predictor. However, (Koo, 2008) did not specifically state it related to intention to play, instead social interaction associated with enjoyment of playing the game. It aligns with (Erturkoglu, Zhang, & Mao, 2015) that stated social interaction did not affect intention to play and instead it may have a larger effect on the social component, which tends to be a solitary activity.

Based on the Wald test analysis for hypothesis 3, there was no statistical support of the relationship of trust and intention to play. This also in line with the likelihood ratio test that revealed no significant difference between the model with and without trust as a predictor. The result is in line with (Wu & Liu, 2014). Wu's study has shown that trust did not affect intention to play directly. In this study, several factors could contribute to this result such as the characteristic of demography and the behavior of Indonesian gamers on the Internet.

For the hypothesis 4, the Wald test analysis revealed that perceived enjoyment was significant. This also supported by the likelihood ratio test that showed a significant improvement of the fit of the modell. This result was similar to the findings of previous studies. (Lee, 2009; Erturkoglu, Zhang, & Mao, 2015; Koo, 2008; Wu & Liu, 2014) have shown the same results. Rationally, players more likely to play enjoyable games rather than unenjoyable ones.

In conclusion, perceived enjoyment is the most crucial experiential factor affecting Indonesian gamers' intention on playing online mobile games

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