

## Perceived Values and Dark Patterns: Investigating Their Influence on Player Continuance Intention to Play Genshin Impact among Indonesian Gamers

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**Abstract.** This study investigates the factors influencing players' continuance intention in the free-to-play mobile game Genshin Impact, focusing on the Indonesian market. Using a quantitative approach, an online questionnaire was distributed to Indonesian Genshin Impact players, and the data were analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS). The research model integrates perceived values (playfulness, attractiveness, connectedness, good price, reward, and time flexibility) and perceived annoyance absence on dark patterns to examine their impact on players' continuance intention. The results reveal that perceived playfulness, rewards, time flexibility, and annoyance absence positively influence players' continuance intention, with perceived playfulness having the strongest effect. The study contributes to a better understanding of player continuance intention in mobile games and provides insights for game developers to design effective game design strategies while considering the ethical implications of employing dark patterns.

**Keywords:** perceived values, mobile game, genshin impact, dark pattern.

## 1. Introduction

The mobile gaming industry has witnessed explosive growth, boasting over 540,000 games and nearly 200,000 publishers globally in 2023 (42matters, Indonesia Mobile Gaming Statistics in 2023 for Android, 2023). Freemium models or free-to-play (F2P) is popular among mobile developers (Irpan, Gohil, Rull, Young, & Shetty, 2020), rely heavily on in-app purchases (Hsiao & Chen, 2016). Loot boxes or gachas that offer randomized rewards for in-app purchases (Zendle, Meyer, Cairns, Waters, & Ballou, 2020), are another prevalent mobile game monetization strategy.

While monetization is crucial, player retention holds equal importance. It significantly impacts revenue forecasting, optimization, and ultimately, the game's longevity (Appsflyer, 2022). Despite its significance, the average per-app Day 30 retention for Q3 2022 dropped 10% compared to the previous year, highlighting a critical challenge for developers (Appsflyer, 2022). Because of this, mobile game developers need a better understanding of how to make their players continue playing their games.

Genshin Impact, a three-year-old mobile game with impressive 6.8 million download figures in Indonesia (Min.news, 2024), exemplifies this challenge. Despite its success, the game recently faced backlash from its Chinese player base due to dissatisfaction with rewards offered during a major event. This incident underscores the delicate balance between monetization strategies and player satisfaction.



Fig.1: Genshin Impact Douyin account post-exodus (Min.news, 2024)

On January 19, 2024, Genshin Impact Douyin account live-streamed a preview of Genshin Impact's upcoming Version 4.4, showcasing details of the Chinese New Year event. However, the reception was far from celebratory. Within two days, the game's official Douyin account witnessed a significant exodus of followers, dropping from 11 million to roughly 9 million. This downward trend continued, reaching a final count of 8.58 million by the following day, as demonstrated in Figure 1. Notably, the negative sentiment extended beyond the Chinese audience, with the global response to the Version 4.4 preview garnering a stark contrast: 53,000 dislikes compared to a mere 22,000 likes, as indicated by

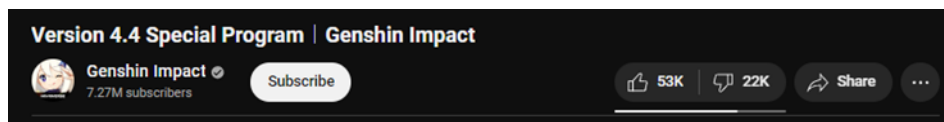


figure 2:

Fig.2: Genshin Impact version 4.4 live broadcast likes and dislikes number (GenshinImpact, 2024)

An analysis of recent Indonesian reviews for Genshin Impact on the Google Play Store reveals a concerning trend. As of February 20, 2024, roughly 40% of the most recent 100 reviews express dissatisfaction with the game as can be seen in figure 3.

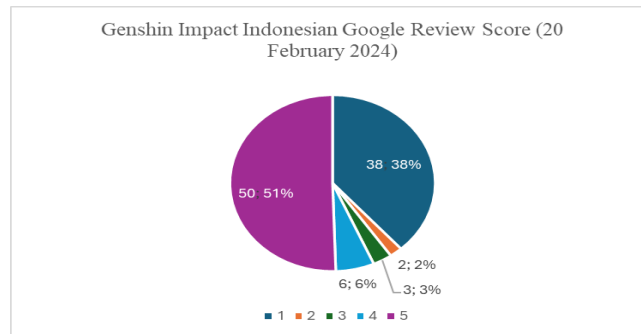


Fig.3: Last 100 Indonesian google review scores as of 20 February 2024 (Googleplay, 2024)

We conducted an initial survey to collect Indonesian Genshin Impact players' thoughts on why people are quitting from playing the game. As can be seen on appendix 2, which is mentioned that what made players quit playing the game are lack of reward, device not up to par with the game, it consume a lot of time, grindy, the lootbox/gacha, boring, repetitive, lack of content, and just busy with real life.

Based posts in Hoyolab, a site made by Hoyoverse, developer of Genshin Impact, many players find the lack of resin, "stamina" system in the game where some contents require certain amount of resins for the content to accessible, to be a problem (Prosation, 2024). Resin system is considered paywall because it fits the criteria (WhichButtonisJump, 2015) on how resin system is limited and players can only continue to play contents that require resin to play whether by waiting for the resin to regenerate very slowly, or by spending money to buy resin. On another note, there are also some discussions about how Genshin Impact is pay-to-win, because as player spend more on the lootbox or gacha and get many strong characters, it can trivialize contents such as Spiral Abyss where players can gain premium currency (Heimdalgc, 2021). The post also has a poll on whether Genshin Impact is pay-to-win or not, which there are 38.91% who voted yes, and 61.09% who voted no. as for lighter discussion, it took place in certain reddit post in r/genshin\_impact where the thread poster asked "why did genshin get to be so popular?", and some of the responses mentioned key points such as beautiful looking characters, amazing music and visual, good gameplay, good price, open world mobile game, discussion with fellow players, and how fun the game is (VanitasMecka, 2021).

There exist "dark patterns" within mobile games, which is something that is purposefully included into a game to give the player an undesirable, negative experience while benefiting the game developer (Dark Pattern Games, n.d.). It manifests in various forms, including pay-to-win mechanics, gacha/lootbox systems, and premium currencies (Aagaard et al., 2022). The aim of the implementation of dark pattern is to influence user behavior through various means, including swaying purchase decisions, inflating engagement time, and even tricking users into accepting privacy-invasive features (Bongard-Blanchy, et al., 2021). Maier & Harr's study points to the potential for users to discontinue using services if the dark patterns become overly intrusive or hinder their intended tasks (Maier & Harr, 2020). Looking at the initial survey conducted, which can be seen at appendix 2, and players discussions online about some designs in the Genshin Impact, there are indications of dark patterns such as the game having stamina system called "Resin" which can be bought with real money, is very limited and valuable, to keep playing some contents multiple times a day in the game; the game being too grindy which is by design to encourage players to spend more money on resins; the game having lootbox or gacha system with bad enough rates to get featured characters or weapons; and the game being pay-to-win because players can spend money on lootbox or gacha to get strong characters to clear hard content, like "spiral abyss", that give valuable rewards such as premium currency much earlier, and also pay money on resins to play some contents that give items that can make characters stronger way more

times than free-to-play (F2P) players. Based on the same initial survey and players discussions online, there are also indications of the game's playfulness and attractiveness, the game generosity on giving rewards, good price, and time flexibility to play the game may influence players to keep playing the game.

The diverse range of business models, policies, and mechanisms employed within mobile games require a deeper understanding of the factors influencing player intention to keep playing the game, particularly in Indonesia. This research aims to address the problem of many players quitting free-to-play mobile game, particularly Genshin Impact, by analyzing the impact of attractiveness, playfulness, connectedness, good price, reward, time flexibility and dark pattern on the player continuance intention to play Genshin Impact in Indonesia.

## **2. Literature Review**

### **2.1. Genshin Impact**

Genshin Impact, a free-to-play mobile game launched globally on September 28, 2020, by Mihoyo, has garnered significant popularity in Indonesia. AppMagic, a mobile game statistics website, reported over 6.8 million downloads in the country by September 2022 (GamerWK, 2022). However, pinpointing the exact number of active players in 2024 presents a challenge. The researcher faces limitations due to restricted access to premium data. Statistical information on user bases is often locked behind paywalls on these platforms, making it inaccessible without paid services. While Genshin Impact's Indonesian community on Discord boasts over 24,874 members as of February 20, 2024, this figure represents only a portion of the overall player base and lacks the comprehensiveness of industry-wide data.

### **2.2. Retention**

User retention, defined as the proportion of initial users who remain active over a specific period (Lin, et al., 2020), plays a crucial role in the success of mobile games. Commonly measured by dividing active users by total registered users, it reveals how frequently players return to the game. Day 1, Day 7, and Day 30 retention are particularly crucial metrics for developers, as they indicate player engagement and potential for monetization. Viljanen et al. underscore the impossibility of achieving sustainable monetization without consistent player engagement or continuance of use (Viljanen, Airola, Pahikkala, & Heikkonen, 2016). Studies exploring player continuance intention to use mobile games employ diverse approaches. Some, such as Esteves et al. and Ye et al., focus on player intention to continue playing the game (Esteves, Valogianni, & Greenhill, 2021) (Ye, Liu, Gao, & Mei, Factors affecting woman's continuance intention for mobile games, 2020), and Marcelino et al. gauge player willingness to continue playing through player loyalty (Marcelino, Leo, & Rafdinal, 2021), while some others like Hsiao & Chen, Purnami & Agus defined loyalty as potentially promote the game along aside player willingness to keep playing a game (Hsiao & Chen, 2016) (Purnami & Agus, 2021).

### **2.3. Perceived Value**

Perceived value, encompassing a user's assessment of the utility they receive relative to the cost (Hsiao & Chen, 2016), plays a pivotal role in understanding user behavior, particularly user continuance intention to use mobile games. Numerous studies have explored the factors influencing this behavior, as follows:

The concept of "emotional value" in mobile games refers to the positive feelings and affective states elicited by the gameplay experience (Hsiao & Chen, 2016). Based on the reddit discussion mentioned in the introduction, it is found that beautiful looking characters, amazing music and visual, good gameplay, one of the first open world mobile game, and game playfulness are what made people play the game (VanitasMecka, 2021), hence this study focuses on two key aspects: perceived playfulness and perceived attractiveness. Perceived playfulness reflects the fun and enjoyment derived from playing

the game. Research by Molinillo et al suggests that players' perceptions of a game's attractiveness, its visual and acoustic design, significantly impact their loyalty (Molinillo, Japutra, & Liébana-Cabanillas, 2020). Similarly, several studies, including those by Hsiao & Chen and Purnami & Agus, have found that perceived playfulness positively influences player loyalty or player willingness to keep playing the game (Hsiao & Chen, 2016) (Purnami & Agus, 2021). Perceived attractiveness encompasses the visual and auditory elements that contribute to the aesthetic appeal of the game (Molinillo, Japutra, & Liébana-Cabanillas, 2020). Additionally, some studies use "perceived enjoyment," a concept closely related to playfulness, which refers to the degree of pleasure and entertainment the player experiences during gameplay (Ye, Liu, Gao, & Mei, Factors affecting woman's continuance intention for mobile games, 2020) (Marcelino, Leo, & Rafdinal, 2021). With all of that in mind, perceived playfulness is adopted from Hsiao & Chen's study, while perceived attractiveness is adopted from Purnami's & Agus' study, and the hypotheses are as follow:

H1. Perceived playfulness positively influences player continuance intention of use on Genshin Impact in Indonesia.

H2. perceived attractiveness value positively influences player continuance intention of use on Genshin Impact in Indonesia.

"social value" refers to the utility derived from mobile games that enhances players' social self-concept (Hsiao & Chen, 2016). Social value is facilitated by features like in-game friend systems and social media communities, which allow for player expression and connection (Lax & Mackenzie, 2019). Based on reddit discussion mentioned in the introduction, it is found that players find it enjoyable to discuss about the game with other as to why the game is popular, and it can be used as an indication that it may affect players to keep playing the game, which is why this study uses "perceived connectedness" to represent social value, reflecting players' sense of connection with others while engaging with games (Purnami & Agus, 2021). Importantly, while mobile games may share similar systems, different mobile game communities can have distinct impacts on individual players (Malisi, Suharsono, & Setiawan, 2017). For instance, research by Ghazali et al. demonstrates that community involvement significantly influences players' continuance intention of use (Ghazali, Mutum, & Woon, 2018). Furthermore, studies suggest that perceived connectedness can influence player loyalty in mobile games (Hsiao & Chen, 2016) (Purnami & Agus, 2021). With all of that in mind, Purnami & Agus' perceived connectedness is adopted for this study, and the hypothesis is as follow:

H3. Perceived connectedness positively influences player continuance intention of use on Genshin Impact in Indonesia.

Based on the reddit thread mentioned in the introduction, good price is one of the reason on why Genshin Impact is popular, and it can be used as an indication that it may affect player to keep playing the game. The concept of "perceived good price" in mobile games extends beyond simply the monetary cost incurred by players. As highlighted by Hsiao & Chen's study, it encompasses the overall utility gained from the game, considering both short- and long-term perceived costs. It serves as an indicator of economic value, reflecting the player's subjective assessment of whether the mobile game service was "worth" the money spent (Purnami & Agus, 2021). Some research suggests that perceived good price can influence player loyalty (Hsiao & Chen, 2016) (Purnami & Agus, 2021). Previous studies demonstrate that in-game rewards can also significantly impact players' decisions (Hsiao & Chen, 2016) (Purnami & Agus, 2021). Rewards as variable that may influence players to keep playing the game is also backed by our initial survey result that can be seen in appendix 2, and the fact that the entire reason the massive exodus that happened around chinese new year was because of the lack of rewards given to players. With all of that in mind, perceived good price and rewards are adopted from Purnami & Agus's study for this study, and the hypotheses are as follow:

H4. perceived good price positively influences player continuance intention of use on Genshin Impact in Indonesia.

H5. perceived reward positively influences player continuance intention of use on Genshin Impact in

Indonesia.

In the context of mobile games, functional value refers to the perceived quality and performance that drive player engagement (Hsiao & Chen, 2016). Based on our initial survey mentioned in the introduction, time flexibility is mentioned due to some players' device can't handle playing the game for too long or not up to the game's specification requirements, and some players are just too busy to spend their time on playing the game, hence this research specifically examines "perceived time flexibility," a feature allowing players to choose when and for how long they dedicate themselves to the game (Hsiao & Chen, 2016). Studies have shown that time flexibility positively influences players willingness to continue playing, as demonstrated by both Hsiao & Chen's and Purnami & Agus's studies (Hsiao & Chen, 2016) (Purnami & Agus, 2021). This suggests that offering players control over their playtime can contribute to their willingness to keep playing the game. With all of that in mind, Hsiao & Chen's perceived time flexibility is adopted for this study, and the hypothesis is as follow:

H6. Perceived time flexibility positively influences player continuance intention of use on Genshin Impact in Indonesia.

"Dark patterns" permeate the digital landscape, influencing user behavior in online services and mobile games through manipulative design choices (Bongard-Blanchy, et al., 2021). These tactics, often deployed without user consent, coerce, deceive, or exploit individuals into making decisions they would not otherwise, undermining their autonomy and informed choice. In the context of mobile games, Zagal et al define them as deliberate design elements that intentionally harm player experiences. Research by Petrovskaya et al suggests that mobile games, compared to PC games, exhibit a wider range and higher frequency of problematic microtransactions (Petrovskaya, Deterding, & Zendle, 2022). In both platforms, players have issues related to monetization-driven designs that degrade player experience, game's transparency, and fairness. The consequences of dark patterns extend beyond individual frustration. Studies by Voigt et al's study demonstrate how these tactics erode consumer trust in brands and contribute to increased annoyance during online shopping experiences (Voigt, Schlögl, & Groth, 2021). Additionally, Gray et al study utilizes "felt manipulation" as a proxy for dark patterns, identifying factors like distrust towards digital goods, privacy concerns, and freemium models as contributing elements (Gray, Chen, Chivukula, & Qu, 2021). Their research reveals a significant distrust among users, with 82.24% of smartphone app users and 89.3% of website users reporting at least occasional distrust.

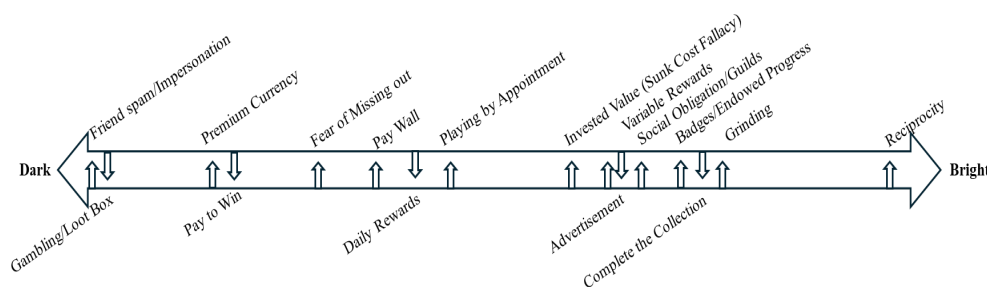


Fig.4: Absolute Ranking of Dark Patterns' Impact (Showing the Average Ranking Across All 4 Workshop Participant Pairs) (Aagaard, Knudsen, Bækgaard, & Doherty, 2022)

Aagaard et al.'s study explores user perceptions of "dark patterns" in mobile gaming, identifying mechanisms like Pay-to-Win designs, Daily Rewards, artificial scarcity, sunk cost fallacies, and gacha/loot box systems (Figure 4). These elements, according to respondents, evoke feelings of being cheated and frustration. Notably, while many players engage with and even enjoy gacha mechanics in their preferred games, a striking consensus is gambling mechanics like gacha/loot boxes and impersonation represent some of the most egregious dark patterns within the mobile gaming landscape, prompting warnings from players themselves to others to avoid such elements. If dark patterns on user

interfaces seriously obstruct the intended task or are sufficiently annoying or frustrating enough, users may consider giving up or discontinuing their use of the service (Maier & Harr, 2020).

Based on the initial survey conducted by us and some players discussions online mentioned in the introduction, some dark patterns in Genshin Impact that players find them problematic are lootbox or gacha system, grinding system, resin system which can be considered paywall, and how the game is pay-to-win. Free-to-play mobile games increasingly utilize "loot boxes" or "gacha" systems, offering players randomized rewards in exchange for in-game currency, often purchased with real-money through in-app purchases (Syvertsen, Ortiz de Gortari, King, & Pallesen, 2022) (Zendle, Meyer, Cairns, Waters, & Ballou, 2020). This monetization strategy has become prevalent within the industry, with 58% of top-grossing mobile games incorporating loot boxes (Zendle, Meyer, Cairns, Waters, & Ballou, 2020). Recognizing potential concerns, industry associations like the Japan Online Games Association have implemented guidelines in 2016 requiring developers to disclose the probability of each item appearing in loot boxes, promoting transparency for players (Hiramatsu, 2019). A "pay-to-win" dark pattern manifests in games that grant players who spend real money an unfair advantage over their competitors. This advantage can take various forms, including access to exclusive "cheat" features, otherwise unobtainable items, or accelerated in-game currency accumulation (Zagal, Björk, & Lewis, 2013). These mechanisms create an uneven playing field, potentially disadvantaging players who choose not or cannot engage in real-world financial transactions. In game design, "grinding" refers to activities requiring players to perform repetitive tasks or assignments. This mechanic can become dark pattern when the game incentivizes players to pay real-world money to bypass the grind altogether, or to extend their grinding time beyond in-game limitations (Zagal, Björk, & Lewis, 2013).

While players encountering paywalls at designated points in a game is not inherently problematic, the transparency and fairness of their implementation determine whether they constitute "dark patterns." Disclosing paywall information upfront allows for informed decision-making. However, paywalls become manipulative and ethically questionable when they lack transparency or when game difficulty escalates to an unreasonable degree, making progression practically impossible without paid elements (WhichButtonisJump, 2015).

The researcher modify Voight et al's perceived annoyance (Voigt, Schlögl, & Groth, 2021), from the degree of annoyance felt, into the degree of annoyance absence felt to give the developers benefit of the doubt that the designs they implemented into Genshin Impact may not be considered dark patterns, although previous studies may found them as dark patterns. Hence the hypothesis is as follow:  
H7. perceived annoyance absence positively influences player continuance intention of use on Genshin Impact in Indonesia

### **3. Research Method**

This research adopted perceived playfulness, perceived connectedness, perceived good price, perceived reward, and perceived time flexibility from Hsiao & Chen, and Purnami studies (Hsiao & Chen, 2016) (Purnami & Agus, 2021), while perceived attractiveness is adopted from Molinillo et al's study (Molinillo, Japutra, & Liébana-Cabanillas, 2020). Perceived annoyance is adopted and modified from Voight et al's study's (Voigt, Schlögl, & Groth, 2021). This research has 25 total indicators as can be seen at appendix 1. Thus the model of this research is as follows:

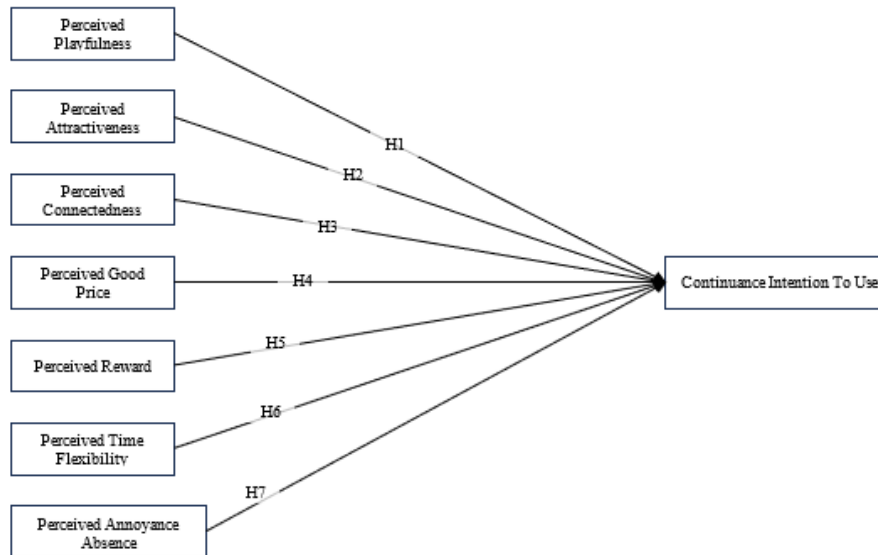


Fig.5: Research model.

This study employs a quantitative approach to investigate the relationships between variables influencing continuance intention to play playing Genshin Impact. Data collection utilizes online questionnaires distributed through Indonesian online gaming platforms and social media, primarily Discord servers and Facebook groups. Purposive sampling is chosen due to its ability to effectively align the sample with the research objectives and enhance study rigor (Campbell et al., 2020). The target for this purposive sampling is Indonesian mobile game players who actively play or have experience with Genshin Impact at least one month. The research acknowledges the limitations of this sampling method, recognizing the broader population of Genshin Impact players in Indonesia, estimated at over 6.8 million based on download data from September 2022 (GamerWK, 2022), but due to the researcher’s limitation on time and resource, getting more than the minimum sample size for that much population is a hard task. As for selection bias, this study tries to spread the questionnaire to online communities as random as possible, ranging from Genshin Impact youtubers communities, official Indonesian Genshin Impact server, and random smaller servers on discord, and facebook groups ranging from random Indonesian Genshin Impact groups, to groups that are catered for Genshin Impact players to complaint about the game. The number of minimum total sample is found using Slovin formula, which is:

$$n=N/ (1+Ne^2)$$

Where n = minimum total sample; N = Population; e = accuracy tolerance percentage for research

$$n=6,857,493/ (1+6,857,493*(0.05)^2)$$

$$n=399 \text{ or } 400$$

This study employs 6-point Likert scale consisting of strongly disagree (1), Disagree (2), somewhat disagree (3), somewhat agree (4), agree (5), strongly agree (6), across the questionnaire. The reason for using the 6-point Likert scale is to enhance the quality of the data (Krosnick, et al., 2002).

The initial section captures respondent profiles, followed by eight sections dedicated to exploring relevant variables, including continuance intention. Most of the questions in the questionnaire used previous research’s variable indicators’ questions, as can be seen in appendix 1, with the exception of perceived annoyance absence, where we modified it from perceived annoyance, which is the degree of annoyance felt (Voigt, Schlögl, & Groth, 2021), into the degree of annoyance absence felt to not paint dark patterns in a bad light by default and to give the developers benefit of the doubt that the designs they implemented into Genshin Impact may not be considered dark patterns. It uses negative-worded questions such as “I find [dark patterns] not annoying” instead of perceived annoyance’s “I find [dark patterns] annoying” in all of the indicators for the same reason.

The research is conducted in two stages. Stage one, wordings for questions measuring dark pattern indicators using perceived annoyance absence are assessed with the help of experienced Genshin Impact players with AR level 60, signifying high in-game knowledge. AR is an abbreviation for Adventure Rank (AR), which is a progression system for player accounts in Genshin Impact. Stage two, the main questionnaire is distributed to online Genshin Impact players for data collection and analyze it. Partial Least Squares (PLS) within Structural Equation Modeling (SEM) is employed using SmartPLS 3 software version 3.2.9 to analyze the collected data and assess the relationships between dependent and independent variables. The analysis follows a two-stage approach, Outer Model Evaluation where the researcher assesses the validity and reliability of the questionnaire indicators, and inner model evaluation, where the researcher conducts structural tests with a significance level of 0.05 where t-value must be higher than 1.96 to have significant influence. To calculate the model after inserting the data into SmartPLS 3, the PLS algorithm uses a "path" weighting scheme, 300 maximum iterations, and a 7-stop criterion ( $10^{-X}$ ). As PLS-SEM is a nonparametric method, bootstrapping is employed to estimate standard errors and compute confidence intervals (Hair, et al., 2021). Ten thousand subsamples is recommended for the final result computations, with a bias-corrected and accelerated (BCa) bootstrap confidence interval method, a two-tailed test type, and a significance level of 0.05.

## **4. Result And Discussion**

### **4.1. Pre-test**

A pre-test was conducted to assess the clarity and comprehensibility of the research questionnaire among dedicated Genshin Impact players. It is best to be aware of response set bias (Chyung, Barkin, & Shamsy, 2018), hence for the pre-test, purposive sampling was employed through Discord and Facebook communities with the help of their admins, making sure that the respondents are given incentives in the form of money, to answer seriously as their response are important to the reliability of our research. The pre-test questionnaire gathered responses from forty highly experienced players who had achieved the maximum Adventure Rank, signifying their expertise in the game. The sample exhibited a concentration of young adults, with 70% falling within the 25-30 age group and 25% belonging to the 18-24 age group. A small proportion (5%, or two respondents) were between 31 and 40 years old, and none were under 18. The sample displayed a significant gender imbalance, with 90% of respondents identifying as male and only 10% (4 respondents) as female. Nearly all participants (97.5%) had played the game for over a year, highlighting their extensive experience. Only one respondent had played for less than a year. Out of 40 responses who are asked with "If you don't feel that there are no questions that you can't understand, then answer no, and if you feel that there are questions that you can't understand, please state the question number and provide criticism and suggestions so that the question can be better understood", 35 participants said "Nope" or "Nah", while 5 of them answered with "no, the question is clear and understandable", "The questions are understandable", "The questions are very clear and easy to understand", "there isn't", "I understand". Based on these positive results, the main questionnaire was subsequently disseminated to broader online mobile gaming communities across Discord and Facebook platforms in Indonesia.

### **4.2. Main Test**

After 400 responses are gathered, it is found that young adults dominated the sample, with 66% falling within the 18–24-year age group. No respondents exceeded 40 years old, pointing to a strong focus on young adult players within the Genshin Impact community. A significant gender imbalance was evident. Males comprised 85% of the respondents, highlighting a potential underrepresentation of female players. Most respondents were seasoned players, having actively engaged with Genshin Impact for over a year, with only seven players who played the game less than a month, which is not included due to the purposive sampling rule. This suggests that the sample primarily focused on established players. After inserting the data into SMARTPLS, the research model preview is as follows:

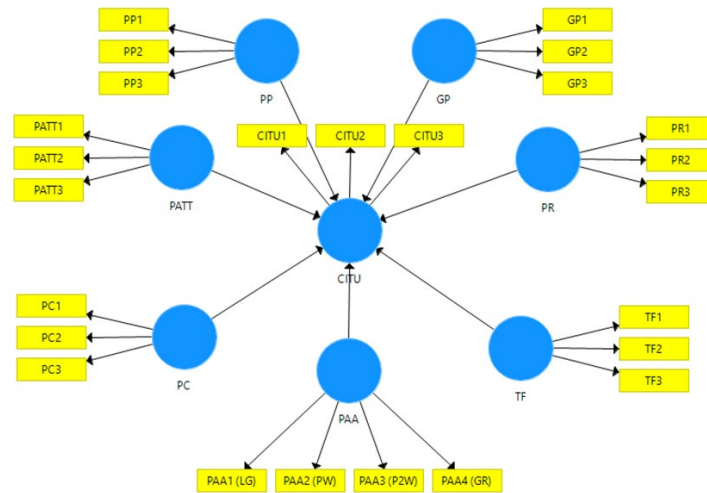


Fig.6. Research model.

Evaluating the outer model involved running the SMARTPLS PLS algorithm with a "path" weighting scheme, 300 maximum iterations, and a 7-stop criterion ( $10^{-X}$ ). Following the calculation, convergent validity was assessed by examining factor loadings in the "model" or "outer loadings" tab of the final results (Appendix 4). All indicators except TF3 demonstrated factor loadings exceeding 0.7, meeting the minimum standard for validity (Hair, et al., 2021). Consequently, TF3 was excluded, while the remaining indicators were deemed valid. After removing TF3 and safe to proceed, researcher examines the average variance extracted (AVE), where the AVE values can be seen in table 1.

Table 1: construct reliability and validity preview

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CITU	0.946	0.947	0.965	0.903
GP	0.841	0.882	0.902	0.754
PAA	0.789	0.79	0.863	0.612
PATT	0.809	0.807	0.888	0.726
PC	0.813	0.821	0.889	0.727
PP	0.884	0.885	0.928	0.812
PR	0.78	0.781	0.872	0.694
TF	0.411	0.411	0.772	0.629

Based on table 1, all of the AVE values are higher than 0.5, which means that every constructs are valid. The next test is heterotrait-monotrait ratio (HTMT) test, where the values must be lower than 0.9 (Hair, Risher, Sarstedt, & Ringle, 2019).

Table 2: heterotrait-monotrait ratio under discriminant validity preview

	CITU	GP	PAA	PATT	PC	PP	PR	TF
CITU								
GP	0.397							
PAA	0.561	0.63						
PATT	0.391	0.25	0.315					
PC	0.337	0.539	0.357	0.389				
PP	0.644	0.429	0.532	0.707	0.467			

PR	0.456	0.808	0.588	0.274	0.5	0.42
TF	0.665	0.515	0.695	0.49	0.479	0.653

Based on table 2, all of HTMT values are lower than 0.9, which means that all of them are valid. After that the researcher proceeded to reliability testing using Cronbach alpha in table 1, where a construct is reliable when the value is higher than 0.7. It is found that all of them except for TF are higher than 0.7 standard. But since TF composite reliability is 0.772 which is higher than 0.7, it means that TF is reliable according to composite reliability standard.

Having established the validity and reliability of the constructs, the study proceeded with an inner model evaluation.

Table 3: R-square and adjusted R-square

	R Square	R Square Adjusted
CITU	0.441	0.431

As can be seen in table 3, the R-squared value for continuance intention to use (CITU) was found to be 0.441, with an adjusted R-squared of 0.431. This indicates that exogenous variables explain or contribute to 44.1% of the variance in CITU, which Hair et al. consider moderate (Hair, et al., 2021). Furthermore, the simultaneous influence of exogenous constructs on CITU is estimated at 0.431 or 43.1%.

Finally, the bootstrapping procedure is conducted using 10,000 subsamples, with a bias-corrected and accelerated (BCa) bootstrap confidence interval method, a two-tailed test type, and a significance level of 0.05.

Table 4: Path coefficient preview post-bostrapping

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
GP -> CITU	-0.012	-0.012	0.053	0.22	0.827
PAA -> CITU	0.199	0.2	0.05	3.95	0.000
PATT -> CITU	-0.023	-0.02	0.055	0.43	0.670
PC -> CITU	0.001	0.004	0.051	0.01	0.992
PP -> CITU	0.422	0.418	0.062	6.80	0.000
PR -> CITU	0.122	0.122	0.052	2.35	0.019
TF -> CITU	0.14	0.14	0.052	2.69	0.007

Based on table 4, it is found that PAA, PP, PR, and TF t-values and P values are higher than 1.96 and 0.05 respectively, which means that they have significant influence toward CITU. Based on the values of path coefficient and t-values of the variables toward CITU it can be inferred that:

Hypothesis 1 “perceived playfulness positively influences player continuance intention of use on Genshin Impact in Indonesia” is accepted.

Hypothesis 2 “perceived attractiveness value positively influences player continuance intention of use on Genshin Impact in Indonesia” is not accepted.

Hypothesis 3 “perceived connectedness positively influences player continuance intention of use on Genshin Impact in Indonesia” is not accepted.

Hypothesis 4 “perceived good price positively influences player continuance intention of use on Genshin Impact in Indonesia” is not accepted.

Hypothesis 5 “perceived reward positively influences player continuance intention of use on Genshin Impact in Indonesia” is accepted.

Hypothesis 6 “perceived time flexibility positively influences player continuance intention of use on

Genshin Impact in Indonesia” is accepted.

Hypothesis 7 “perceived annoyance absence positively influences player continuance intention of use on Genshin Impact in Indonesia” is accepted.

### **4.3. Discussion**

This study identifies three out of four key variables – perceived annoyance absence (PAA), perceived playfulness (PP), perceived reward (PR), and perceived time flexibility (TF) – that positively influence the continuance intention to use (CITU) among Genshin Impact players in Indonesia. Notably, perceived playfulness exerts the most significant effect on CITU. Other variables such as perceived good price (GP), perceived connectedness (PC), and perceived attractiveness (PATT) are found to not have significant influence toward player continuance intention to use Genshin Impact.

Perceived playfulness (PP) significantly influences Genshin Impact player continuance intention to use aligns with various research on continuance intention to keep playing. Marcelino et al’s study found a positive association between perceived enjoyment and loyalty/continuance intention in E-sports (Marcelino, Leo, & Rafdinal, 2021). Similarly, Ye et al observed a significant positive effect of perceived enjoyment on women's continued use intention for mobile games (Ye, Liu, Gao, & Mei, 2020). Furthermore, Ghazali et al’s study found a positive impact of enjoyment on continuance intention in Pokémon Go (Ghazali, Mutum, & Woon, 2018). Additionally, Purnami & Agus’ study and Hsiao & Chen’s study reported a similar positive relationship between perceived playfulness and player willingness to keep playing the game (Hsiao & Chen, 2016) (Purnami & Agus, 2021). These findings suggest that enhancing the perceived playfulness of Genshin Impact's content through enjoyable and fun elements could potentially contribute to an increased number of players who continue playing the game.

Perceived reward (PR) significantly influences Genshin Impact player continuance intention to use aligns with previous research by Hsiao and Purnami (Hsiao & Chen, 2016) (Purnami & Agus, 2021). Both studies demonstrate a positive and statistically significant relationship between perceived reward and player loyalty or continued engagement in mobile games. This suggests that increasing the perceived value of rewards offered by Genshin Impact could contribute to sustained player continuance intention to play the game.

The positive influence of perceived time flexibility (TF) on Genshin Impact player continuance intention to use is consistent with prior research. Studies by Hsiao and Purnami have demonstrated a significant, positive relationship between time flexibility and player loyalty or willingness to keep playing mobile games (Hsiao & Chen, 2016) (Purnami & Agus, 2021). This suggests that facilitating easier access to play Genshin Impact whenever players would likely contribute to increased number of players keep playing the game.

The positive influence of perceived annoyance absence (PAA) on Genshin Impact player continuance intention to use uncovers an interesting finding: even though dark patterns like loot boxes and paywalls are generally disliked, players will still keep playing Genshin Impact as long as the dark patterns are not too annoying. This echoes the work of Voigt et al, who found that dark patterns can be effective despite user annoyance (Voigt, Schlögl, & Groth, 2021). While many players may find these tactics frustrating (Appendix 5), the study reveals that a segment of players who tolerate dark patterns exhibit higher rates of continuance intention to play, highlighting the complex relationship between player psychology and game mechanics. This presents a challenge for developers: how to leverage the potential of dark patterns for players continuance intention to play Genshin Impact without pushing them into the realm of excessive annoyance, as research by Maier & Harr’s study suggests, it can lead to player churn (Maier & Harr, 2020). Simply removing dark patterns might not be the solution, instead, developers may benefit from understanding player tolerance levels and implementing these elements ethically and unobtrusively. This study opens the door for further research into player motivations and the specific dark patterns tolerated by different demographics.

Good price not being significant does not align with previous studies that studied good price such

as Purnami & Agus's and Hsiao & Chen's. It could be because many Indonesian players, or at least the respondents, are free-to-play or economically lacking, which is also mentioned in appendix 2 although only one person. It could mean that good price is not significant enough for many Indonesian players to keep playing the game. This can be considered as the study's limitation, and need further exploration and clarification in future research. Perceived connectedness not being significant toward players continuance intention to use does not align with previous studies that studied perceived connectedness such as Purnami & Agus's and Hsiao & Chen's. It could be because since the game can be finished by single player and is mostly story-based game, not many players find having other players coming to their world or interacting with other players to be significant enough to keep them playing the game. The game also barely encourage players to play with their friends, due to the limited number contents and time (due to resin limitation) that can be enjoyed with friends. Perceived attractiveness not having significant influence toward continuance intention is the shocking part, since it contradict the result of previous studies, and also the players online discussions. It could be because even if Indonesian players find the game attractive, they don't find it significant enough for them to keep playing the game.

This study's exogenous variables can only explain or contribute to 44.1% of the variance in players' continuance intention to play Genshin Impact, showing the limitation of this study and indicating that additional factors not examined here may account for 55.9% of the variance in players' continuance intention to play Genshin Impact. These remaining factors warrant further exploration in future research.

#### **4.4. Implication**

There are two implications of this research, implication for academics and implication for practice:

For academics, this research addresses a gap in the literature by delving into players continuance intention to use online mobile game, on industry with generally low retention rates. It offers valuable insights into influencing factors specifically for the popular game Genshin Impact. The study's key contributions lie in successfully integrating perceived values and perceived annoyance absence (dark patterns) into a research model on online mobile game continuance of use, thereby enhancing understanding of the relationships between these factors and player continuance intention to use mobile game Genshin Impact. Notably, the model identifies perceived playfulness, rewards, time flexibility, and perceived annoyance absence as positive influences on player continuance intention to use Genshin Impact, with playfulness having the strongest impact. Additionally, this study also contributes to understanding more about the influence of dark pattern on online mobile game, especially how it can still have positive influence toward players continuance intention to play online mobile game as long as the players don't find it too annoying.

For practice, mobile game developers, particularly Genshin Impact developers, can gain valuable insights from this research to improve player retention by catering to players continuance intention to play the game. The findings emphasize that creating an enjoyable and entertaining game is the most effective strategy, as perceived playfulness has the strongest positive influence on players' intention to continue playing. Using the responses that can be seen in appendix 2 as the hint, developers can try, making more end game contents that are not repetitive enough, and then also make existing contents to also not be repetitive, since majority of the player activity after finishing the story is mostly spend on item grinding by doing super repetitive contents like "Domains" (usually called dungeon in other game). While dark patterns can still be effective, careful consideration must be given to avoid excessive or annoying implementations. Based on the initial survey and online discussions, Genshin Impact developer can try decreasing the required number of pulls needed to reach "pity", which is a failsafe system when a players pulled too much on lootbox or gacha; increasing the resins that a player can get in a day; and make domain farming less grindy. Additionally, the study suggests providing ample rewards, which the lack of it was what caused the massive exodus happened around Chinese new year, and what caused many players, especially non-paying players, to stop playing the game. Maybe provide more premium currency as a reward from spiral abyss, or maybe make new permanent content that also give premium currency just like spiral abyss while at it to also improve the playfulness of the game. As

for time flexibility, ensuring game accessibility can be achieved by further simplifying the device specification required to play the game if possible.

## 5. Conclusion

The current research, through its results and discussion, arrives at the conclusion that four variables exert a significant direct influence on players continuance intention to use online mobile game Genshin Impact. These are perceived playfulness, perceived reward, perceived time flexibility, and perceived annoyance absence. Among these four, perceived playfulness demonstrates the strongest impact on continuance of use. The model employed implies that enhancing the game's fun aspect, providing more rewards, facilitating anytime accessibility, and mitigating the annoyance associated with dark patterns would encourage players to continue playing. Notably, variables such as perceived attractiveness and connectedness, which prior research found to be significantly related to player willingness to continue playing mobile games (Purnami & Agus, 2021) (Molinillo, Japutra, & Liébana-Cabanillas, 2020), were found to have no significant relationship with player continuance intention to use Genshin Impact players. It is important to acknowledge that the variables employed in this model still account for only 44% of the factors influencing Genshin Impact players continuance intention to use, falling short of a 50% explanatory power.

Based on this study's findings, future research should try to explore and clarify the relationship of perceived good price, connectedness, and especially attractiveness, which are deeped not having significant influence toward players continuance intention. Future research should also explore deeper on the ethical way of implementing dark patterns, that emphasize on low level of annoyance; exploring on how to improve the game's playfulness further; exploring the ways to lower the device specification required to play the game at anytime; and exploring what kind of rewards will satisfy Genshin Impact players. Lastly, future research should explore additional variables that may have influence toward player continuance intention to play Genshin Impact that are not studied in this study

## References

- 42matters. (2023). *Indonesia Mobile Gaming Statistics in 2023 for Android*. Retrieved 2023, from 42matters: <https://42matters.com/indonesia-mobile-gaming-statistics>
- Aagaard, J., Knudsen, M. E., Bækgaard, P., & Doherty, K. (2022). A Game of Dark Paterns: Designing Healthy, Highly-Engaging. *CHI Conference on Human Factors in Computing Systems Extended Abstracts*. New Orleans.
- Appsflyer. (2022). *Attention Retention! 2022 app retention benchmarks report*. (appsflyer) Retrieved 03 16, 2023, from <https://www.appsflyer.com/resources/reports/app-retention-benchmarks/>
- Bongard-Blanchy, K., Doublet, S., Rossi, A., Koenig, V., Rivas, S., & Lenzini, G. (2021, June). "I am Definitely Manipulated, Even When I am Aware of it. It's Ridiculous!" - Dark Patterns from the End-User Perspective. *DIS '21: Designing Interactive Systems Conference 2021*, 763-776. Retrieved April 2023, from bounteous : <https://dl.acm.org/doi/10.1145/3461778.3462086>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., . . . Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652-661.
- Esteves, J., Valogianni, K., & Greenhill, A. (2021). Online social games: The effect of social comparison elements on continuance behaviour. *Information & Management* 58(4), 1-15.
- Chyung, S., Barkin, J. R., & Shamsy, J. A. (2018). Evidence-Based Survey Design: The Use of Negatively Worded Items in Surveys. *Performance Improvement*, 16-25.

- GamerWK. (2022, 8 9). *Salip Jepang, Indonesia Adalah Negara ke-4 dengan Pemain Genshin Impact Terbanyak*. Retrieved from GamerWK: <https://gamerwk.com/salip-jepang-indonesia-adalah-negara-ke-4-dengan-pemain-genshin-impact-terbanyak/>
- GenshinImpact. (2024, January 19). *Version 4.4 Special Program / Genshin Impact*. Retrieved from Youtube: <https://www.youtube.com/watch?v=abZdO3rWoVc>
- Ghazali, E., Mutum, D. S., & Woon, M.-Y. (2018). Exploring player behavior and motivations to continue playing Pokémon GO. *Information Technology & People*, 32(3), 646-667.
- Googleplay. (2024, February 20). *Genshin Impact*. Retrieved from Google Play: <https://play.google.com/store/apps/details?id=com.miHoYo.GenshinImpact&hl=id&gl=US>
- Gray, C. M., Chen, J., Chivukula, S. S., & Qu, L. (2021). End User Accounts of Dark Patterns as Felt Manipulation. *Proceedings of the ACM on Human-Computer Interaction* (pp. 1-25). Association for Computing Machinery.
- Gray, C. M., Toombs, A., & Kou, Y. (2018). The Dark (Patterns) Side of UX Design. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)* (pp. 1–14). New York: Association for Computing Machinery.
- Hair, F. J., Risher, J. J., Sarstedt, M., & Ringle, M. C. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 2-24.
- Hair, J. F., Hult, G. T., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Evaluation of the Structural Model*. In: *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*. Cham: Springer.
- Hamari, J., Hanner, N., & Koivisto, J. (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, 1-15.
- Heimdalgc. (2021, 10 13). *Is Genshin Impact "PAY TO WIN"?* Retrieved from GameFAQs: <https://gamefaqs.gamespot.com/boards/270518-genshin-impact/79708726?page=18>
- Hiramatsu, A. (2019). A Research of Social Game Users' Attitude to "Gacha" Probability Announcement. *8th International Congress on Advanced Applied Informatics (IIAI-AAI)*.
- Hsiao, K.-L., & Chen, C.-C. (2016). What Drives In-app Purchase Intention for Mobile Games? An Examination of Perceived Values and Loyalty. *Electronic Commerce Research and Applications*, 16, 18–29.
- Irgan, E., Gohil, A., Rull, H., Young, R., & Shetty, S. (2020). *The 2020 Mobile Game Monetization Report*. Unity.
- Krosnick, J. A., Holbrook, A. L., Berent, M. K., Carson, R. T., Hanemann, W. M., Kopp, R. J., . . . Conaway, M. (2002). The Impact of "No Opinion" Response Options on Data Quality. *Public Opinion Quarterly*, 371–403.
- Lax, G. L., & Mackenzie, M. (2019). Against All Odds: Desire and Monetisation in Japanese Mobile Games. *Proceedings of DiGRA 2019: What's Next?*
- Lin, Y.-H., Chen, S.-Y., Lin, P.-H., Tai, A.-S., Pan, Y.-C., Hsieh, C.-E., & Lin, S.-H. (2020). Assessing User Retention of a Mobile App: Survival Analysis. *JMIR Mhealth Uhealth*.
- Maier, M., & Harr, R. (2020). Dark Design Patterns: An End-User Perspective. *Human Technology*, 170-199.

- Malisi, S., Suharsono, & Setiawan, S. (2017). Language and Identity in Online Gamer Community. *Journal of English Language and Literature*, 8, 617-622.
- Marcelino, S. L., Leo, G., & Rafdinal, W. (2021). Esports: An Empirical Study of Factors Affecting Continuance Intention. *Proceedings of the 2nd International Seminar of Science and Applied Technology (ISSAT 2021)* (pp. 690-696). Atlantis Press.
- Min.news. (2024, February 20). *ost 2.5 million followers, but Genshin Impact only spent 2.4 billion*. Retrieved from min.news: <https://min.news/en/game/485e2fec5888b52b31a65d47316dc483.html>
- Molinillo, S., Japutra, A., & Liébana-Cabanillas, F. (2020). Impact of perceived value on casual mobile game loyalty: The moderating effect of intensity of playing. *Journal of Consumer Behaviour* Volume 19, Issue 5 p. 493-504, 19(5), 493-504.
- Petrovskaya, E., Deterding, S., & Zendle, D. (2022). Prevalence and Salience of Problematic Microtransactions in Top-Grossing Mobile and PC Games: A Content Analysis of User. *CHI '22: ACM CHI Conference on Human Factors in Computing Systems*. New Orleans.
- Prosation. (2024, March 30). *The three problems that cancel each other out: resin, artifact RNG, and combat difficulty*. Retrieved from Hoyolab: <https://www.hoyolab.com/article/26446203>
- Purnami, L. D., & Agus, A. A. (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). *ASEAN Marketing Journal*, 12(1), 9-19.
- Radesky, J., Hiniker, A., McLaren, C., Akgun, E., Schaller, A., Weeks, H. M., . . . Gearhardt, A. N. (2022). Prevalence and Characteristics of Manipulative Design in Mobile Applications Used by Children. *JAMA Netw Open*, 1-11.
- SMARTPLS. (n.d.). *Discriminant Validity Assessment and Heterotrait-monotrait Ratio of Correlations (HTMT)*. Retrieved from SMARTPLS: <https://www.smartpls.com/documentation/algorithms-and-techniques/discriminant-validity-assessment/>
- Statista. (2022). *Mobile Games - Indonesia*. (Statista) Retrieved 2023, from <https://www.statista.com/outlook/dmo/digital-media/video-games/mobile-games/indonesia>
- Syvertsen, A., Ortiz de Gortari, A. B., King, D. L., & Pallesen, S. (2022). Problem mobile gaming: The role of mobile gaming habits, context, and platform. *Nordic Studies on Alcohol and Drugs*, 39(4), 362-378.
- Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *International Journal of Academic Research in Management*, 28-36.
- Thongmak, M. (2020). Determinants of Intention to Play Pokémon Go. *Heliyon*, 6(12), 1-13.
- VanitasMecka. (2021). *Why did genshin get to be so popular?* Retrieved from Reddit: [https://www.reddit.com/r/Genshin\\_Impact/comments/pb4e92/why\\_did\\_genshin\\_get\\_to\\_be\\_so\\_popular/](https://www.reddit.com/r/Genshin_Impact/comments/pb4e92/why_did_genshin_get_to_be_so_popular/)
- Viljanen, M., Airola, A., Pahikkala, T., & Heikkonen, J. (2016). Modelling User Retention in Mobile Games. *2016 IEEE Conference on Computational Intelligence and Games (CIG)* (pp. 1-8). Santorini, Greece: IEEE.
- Voigt, C., Schlögl, S., & Groth, A. (2021). Dark Patterns in Online Shopping: of Sneaky Tricks, Perceived annoyance absence and Respective Brand Trust. *HCI* (pp. 143-145). Springer.

WhichButtonisJump. (2015, 7 8). *You Shall Not Pass! The 4 Types of Paywall in Mobile Games*. Retrieved from Which Button is Jump: <http://www.whichbuttonisjump.com/you-shall-not-pass-the4-types-of-paywall-in-mobile-games/>

Ye, P., Liu, L., Gao, L., & Mei, Q. (2020). Factors Affecting Woman's Continuance Intention for Mobile Games. *International Journal of Information and Communication Technology Education*, 48-67.

Zagal, J. P., Björk, S., & Lewis, C. (2013). Dark Patterns in the Design of Games. *Foundations of Digital Games 2013*. Chania: Foundations of Digital Games Conference (FGD).

Zendle, D., Meyer, R., Cairns, P., Waters, S., & Ballou, N. (2020). *The prevalence of loot boxes in mobile and desktop games*. Society for the Study of Addiction.

## Appendix

Appendix 1. Variables and their indicators

Perspective	Variables	Description	Indicator	Source
Emotional	perceived playfulness	playfulness is the player's feeling of pleasure or enjoyment from the mobile game	PP1. I think playing Genshin Impact is fun	(Hsiao & Chen, 2016)
			PP2. I think playing Genshin Impact is enjoyable	
			PP3. I think Genshin Impact is interesting	
	perceived attractiveness	attractiveness is the visual and acoustic elements that make up the mobile game's aesthetic design	PATT1. I find that Genshin Impact is visually attractive	(Molinillo, Japutra, & Liébana-Cabanillas, 2020)
			PATT2. I am attracted by the visual appeal of Genshin Impact	
			PATT3. I am attracted by the acoustic appeal of the game	
Social	perceived connectedness	perceived connectedness is a person's perception of their connection to others while engaging in mobile game play	PC1. I think through Genshin Impact I can connect with other players	(Purnami & Agus, 2021)
			PC2. I think I have bond with other Genshin Impact players	
			PC3. I think I obtain benefit from Genshin Impact community	
Economic	perceived good price	perceived good price is the extent to which customers feel that the financial cost they forgo is justified by the quality of the mobile game service they receive	GP1. The virtual features sold in Genshin Impact fulfil my expectation	(Purnami & Agus, 2021)
			GP2. The virtual features sold in Mobile Legend is suitable with the price	
			GP3. I think virtual feature sold in Genshin Impact is economical	
	perceived reward	perceived reward is benefits that are obtained or felt while playing a mobile game	PR1. I think reward offered in Genshin Impact have reasonable value	(Purnami & Agus, 2021)
			PR2. It is highly likely to get rewards in Genshin Impact	
			PR3. I think reward offered in Genshin Impact is something I want	
Functional	Perceived time flexibility	Perceived access flexibility is a term used to describe a feature in mobile games that lets players pick when and for how long they want to play.	TF1. I have control toward time playing Genshin Impact	(Hsiao & Chen, 2016)
			TF2. I can play Genshin Impact anytime	
			TF3. I can begin and stop playing Genshin Impact at anytime	
Dark Pattern	perceived annoyance absence	perceived annoyance absence is the level of annoyance felt for each dark pattern designs while playing a mobile game.	PAA1 (LG). Lootbox/Gacha is not annoying	(Voigt, Schlögl, & Groth, 2021)
			PAA2 (PW). paywall is not annoying	
			PAA3 (P2W). pay-to-win is not annoying	
			PAA4 (GR). grinding is not annoying	
Retention		continuation intention of use is the likelihood that	CITU1. I plan to play Genshin Impact during the next month	(Hamari, Hanner, &

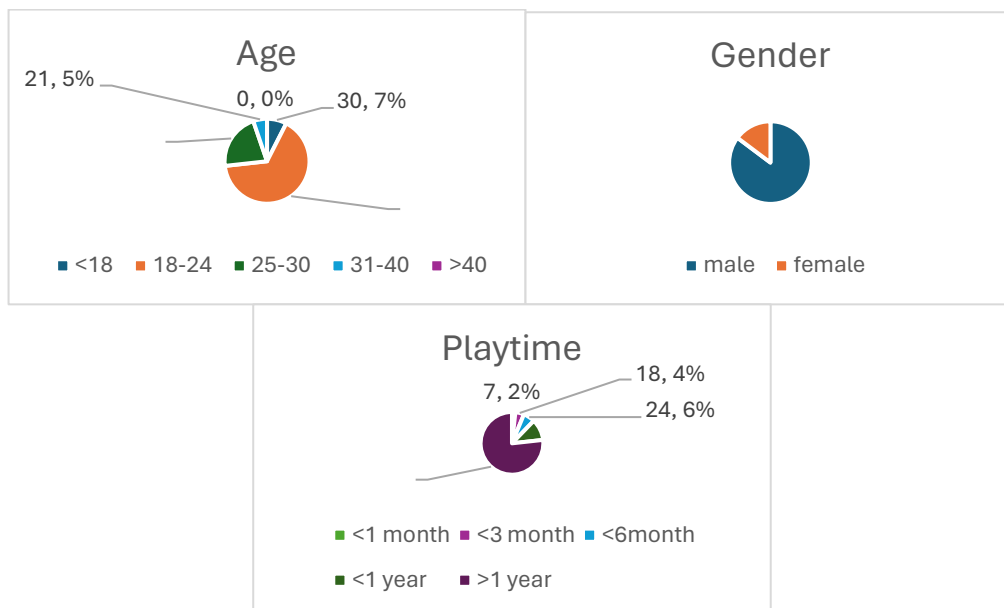
	continuance intention of use	someone maintains or keeps using a specific application is known as the continuation of intention to use.	CITU2. I predict that I will keep playing Genshin Impact in the future	Koivisto, 2020)
			CITU3. I intend to continue playing PG in the future	(Ghazali, Mutum, & Woon, 2018)

Appendix 2. Asking Genshin Impact players whether there are many players quitting or not, and likely reason why (29 respondents answered)

No	According to your observations, do many players stop playing Genshin Impact, and if possible, please state for what reason
1	There is, because the reward given is not satisfactory
2	Many old players feel burnout because the content presented is nothing new, and the exploration of Sumeru which is very boring and difficult. It is the starting point for players to feel burnout and stop playing this game. Developers who do not want to listen to their community complaints are also one of the main factors for players to feel upset with this game.
3	Many, simple reasons, repetitive games will cause burnout when played for a long time
4	There is, because it consumes a lot of time (at the time of story and exploration) and effort, which makes many players stop playing
5	Repetitive factors that make players feel bored so they stop, and the lack of end-game content for players.
6	not much in my opinion, most of them may take place in high AR or near endgame. often maybe because of boredom then the Feedback Survey requested by Hoyoverse has no transparency & obstacles with devices that are less capable.
7	device problem
8	device, because bored, busy, lazy to play
9	1. There is no endgame content that players must pursue 2. The initial game concept that was explored after 1 year finally no longer became attractive to players and only became a burden to require players to log in every day to do daily missions 3. Players are satisfied with their characters and no longer need to be chased because all content can be completed easily (bored)
10	device, busy, bored
11	Quite a lot, which is very often due to device problems, bored with genshin or lured by other games
12	Type 1 (Normie), just play occasionally, they usually do not follow the community and drama on Genshin, so they are not affected. Usually stop playing because it is just boring. Type 2 (Speedrunner), these type of people basically 100% All Content on the first day a content just released. All map, all event. These types of people usually understand Genshin drama. These people usually stop playing a lot of time because there is no content left. Type 3 (BK), Fed Up with kikir Impact (Kikir Impact is what they call genshin impact every time they gave so little rewards, hence "kikir" or miser). Type 4 (Device), the game took so much storage.
13	Yes, because the size of the game is getting bigger and the gacha dregs
14	Device factor, thin player patience, loneliness...
16	Most of my FLs (In-game friend list) who have played mostly stop because they are fed up with genshin content is not too hype for old players and the exploration system in genshin takes care of too much energy. Some feel surrendered because of the vast area to be looted
17	Grinding time clashes with activities in real life
18	Time, device, life in real live, and no interesting content.
19	Gacha always dregs & possibly due to losing the rate up (a gacha banner usually promote characters or weapons with increased appearance rate) And the long story (no skip) makes players who only have a little playing time decide to stop.
20	Gacha is always dregs and without any skip story feature
21	Because there are not many interesting things to play once the story, exploration and main events have been completed. In addition, the rewards are not much, and great pity (especially for weapons) makes players lazy if they do not get the desired character

22	Many stops playing because they feel there is no free time for grinding
23	Genshin players have a lot of people stopped playing because the endgame event is very lacking and the rate of "social assistance" (as in free premium currency rewards) for players is very little so that many lose interest in continuing to play.
24	many, it is really boring to wait for a click on the story that cannot be skipped. Gacha dregs (luck issue) and poor (no offense)
25	A lot, because of hard grinding artifacts and 50:50 gacha, hard pity, and maybe boring gameplay
27	Yes, because they are busy in real life
28	Quite a lot, in my opinion because endgame content is less impactful for many players e.g. tcg card game (not all players like tcg) and grinding artifact materials that seem difficult to achieve certain criteria
29	yes, because they are busy in real life

Appendix 3. Age, Gender, and Playtime of the main test response



Appendix 4. Outer loadings pre-TF3 removal

	CITU	GP	PAA	PATT	PC	PP	PR	TF
CITU1	0.951							
CITU2	0.953							
CITU3	0.947							
GP1		0.872						
GP2		0.919						
GP3		0.811						
PANN1 (LG)			0.785					
PANN2 (PW)			0.785					
PANN3 (P2W)			0.797					
PANN4 (GR)			0.761					
PATT1				0.894				
PATT2				0.877				
PATT3				0.78				
PC1					0.84			
PC2					0.89			
PC3					0.826			

PP1	0.916
PP2	0.911
PP3	0.876
PR1	0.832
PR2	0.844
PR3	0.823
TF1	0.770
TF2	0.806
TF3	0.514

Appendix 5. Lootbox/gacha, paywall, pay-to-win, grinding annoyance charts.

