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The influence of perceived aggressive monetization on mobile gamers' in-app purchase behavior

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ABSTRAK

Popularitas game seluler meningkat dengan pesat. Kemajuan teknologi meningkatkan pengalaman bermain game seluler, membuatnya semakin menarik dan memikat secara visual, dan menarik lebih banyak pengguna. Model bisnis In-App Purchase (IAP) adalah sumber pendapatan utama bagi sebagian besar aplikasi seluler, termasuk game. Meskipun aplikasi dapat digunakan secara gratis, pengguna diberikan pilihan untuk membeli fitur atau konten tambahan. Studi kuantitatif ini bertujuan untuk mengidentifikasi faktor utama yang memprediksi kesediaan pengguna untuk mengeluarkan uang untuk pembelian IAP. Studi ini menggunakan konstruk yang dikenal sebagai Perceived Aggressive Monetization (PAM), selain variabel kontrol diri dan pembelian IAP impulsif terdahulu. Responden dalam studi ini berjumlah 264 orang dan menggunakan kuesioner online dengan skala Likert 5 poin, dengan menggunakan metode non-probability sampling. Studi ini menggunakan metode PLS-SEM untuk menganalisis data responden. Hasilnya, varibel PAM menjadi prediktor signifikan terhadap kesediaan pengguna untuk membeli IAP, dengan kata lain, pengguna merasa bahwa monetisasi yang dijalankan pada game seluler terlalu agresif. Sedangkan kontrol diri dan pembelian IAP impulsive terdahulu tidak berpengaruh signifikan terhadap kesediaan pengguna untuk membeli IAP. Pengembang game seluler harus mempertimbangkan sejauh mana pemain merasa terlalu dimonetisasi. Untuk mengurangi persepsi negatif pemain, pengembang game seluler disarankan untuk memprioritaskan penggunaan strategi monetisasi yang etis, terutama yang mencegah adiksi pada IAP.

ABSTRACT

Popularity of mobile video games is rapidly increasing. A larger

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audience is drawn in by the increasingly captivating and visually appealing mobile gaming experiences thanks to technological advancements. The In-App Purchase (IAP) monetization model is the main revenue for most mobile games. Although the application can be used for free, users can choose to pay for extra features or content. This quantitative study sought to identify the determinant of users' willingness to spend money on IAP. This study used a construct known as Perceived Aggressive Monetization (PAM), besides variables of self-control and previous impulsive spending. This study's respondents totaled 264 and used a 5-point likert scale online questionnaire. Non-probability sampling was used in this study. This study employed PLS-SEM to analyze respondent data. Therefore, PAM emerged as a significant predictor of willingness to spend, in other words, players perceive that monetization employed in mobile games is aggressive. Meanwhile, self-control and previous impulsive spending did not significantly influence users' willingness to spend. Mobile game studios must consider how players perceive aggressive monetization in the mobile games they play. To mitigate negative player perception, mobile game studios should prioritize the use of ethical monetization strategies, particularly those that discourage addiction to IAP.

INTRODUCTION

Mobile gaming is now the most popular and profitable tool for major internet platforms, driven by the advancements in internet connection (Li et al., 2022). Martin et al. (2020) suggest that online games can cater to diverse personalities and preferences by combining various levels and content categories. Mobile games have evolved to appeal to people of all ages. Mobile gaming is one of the few industries to benefit from COVID-19 (Buzulukova & Kobets, 2022).

According to Statista (2019), the global mobile game market is anticipated to generate US$83.64 billion in 2024, with Indonesia's share of that revenue expected to reach US$316.80 million. Additionally, Indonesia's mobile game revenue came in third place among ASEAN nations, behind Thailand and the Philippines. In scope and production cost, PC and console games excelled mobile games, but mobile games revenue was higher (Curry, 2023). Mobile games are more accessible and reach a wider audience due to it. Mobile games income has also increased thanks to business models including mobile advertising and in-app purchases (IAP).

A number of studies have examined in-game virtual goods purchase predictors. Mobile games studies have been focused on the purchase intention approach, viewed from the constructs such as perceived value and loyalty (Hsiao & Chen, 2016), compensatory mechanism (Syahrivar et al., 2022), playfulness and stickiness (Pangaribuan et al., 2021), social value (Hamari et al., 2020), and UTAUT model (Ericska et al., 2021). These studies used concepts to identify purchase intention in

virtual goods and found that the variables are significant indicators. Salehudin & Alpert (2022) argued that purchase intention is ineffective when approaching IAPs. The research found that mobile game in-app purchases (IAPs) made by players are more of spontaneous behavior and F2P players prefer free gameplay. A tiny percentage of F2P users generate IAPs.

Salehudin & Alpert (2024) believed "purchase intention" does not accurately reflect in-app buying habits. The main issue with intention-based studies is that most only examined at the intention. Current academic literature has paid little attention to the relationship between intentions and spending habits. Since IAP spending predicts consumer behavior, Salehudin & Alpert (2024) suggest using the spending-based approach to study IAP behavior. According to Salehudin & Alpert (2024), the spending-based method could be more suitable for studying IAP because it tracks users' actual actions rather than intentions. Due to its focus on actual spending, the spending-based method better represents IAP behavior than the intention-based method.

Salehudin & Alpert (2022) used perceived unfairness by Seiders & Berry (1998) to study user IAP spending behavior and identified themes related to perceived fairness, and suggested the construct Perceived Aggressive Monetization (PAM) from user-generated game reviews and in-depth interviews. Perceived unfairness will affect customers' willingness to pay and likelihood of making additional purchases. The term "Perceived Aggressive Monetization (PAM)" captures users' feelings when they believe that the monetizing strategy of the applications prioritize profit over user welfare (Salehudin & Alpert, 2022).

Users' self-control contributes to their buying behaviour, as it observes and regulates users' own thought processes and financial decisions based on internalized standards (Haws et al., 2012). A person's lack of self-control increases their vulnerability to the temptation of making an unplanned purchase (Lehmann et al., 2019). In the setting of mobile games, Salehudin & Alpert (2022) pointed out that self-control negatively influenced player's actual spending on IAP. These findings suggest that users exhibiting low self-control might be more likely to overspend on IAPs. Users who exercise self-control may evaluate the fairness of the game monetization strategies (Salehudin & Alpert, 2022). Users' evaluation may increase their perception of unfairness in relation to aggressive monetization tactics.

Users' perceptions of game monetization practices may also be influenced by past impulsive purchases, which could raise their perception of aggressive monetization (Salehudin & Alpert, 2022). As users become more conscious of their own impulsivity and the consequences, this may increase their unwillingness to pay for future IAPs. Users with a history of impulsive spending might internalize prior experiences in which they felt taken advantage of by aggressive game monetization tactics (Salehudin & Alpert, 2022). Since they link their impulsivity to sentiments of

regret and exploitation, this unpleasant experience may strengthen their perception of PAM.

Many online services, especially mobile gaming, employ the IAP model, also known as free-to-play (F2P) or *freemium* model (Hamari et al., 2020). In 2022, IAP was the most popular app monetization model (Hackett, 2022). Players are offered titles at low or no cost, removing barriers to download and play, broadening the player base, and eventually allowing games to deliver value without initial payment (Arkenberg & Loucks, 2021). Players can easily add content or features to their game with in-app purchases. In-game products like virtual currencies, weapons, gears, character skins, and others can boost excitement and competitiveness (Syahrivar et al., 2022).

An underlying challenge of the mobile games IAP model is its reliance on a minority of users to engage in in-app purchases. Merely 2.2 percent of players made any in-app purchase transactions, while the bulk of app revenue, specifically 46 percent, is generated by the top 10 percent of these spenders (Zins, 2018). Big spenders, also known as "Whales" in the gaming industry, account for 10 percent of users but 70 percent of In-App Purchases (Salehudin & Alpert, 2022). Given the considerable imbalance, it is critical to investigate why so few players pay actual IAP. When mobile game studios ignore the factors influencing players' unwillingness to make IAPs, it may pose a problem for their monetization strategy and potentially impact their profitability, as this can reduce players' willingness to make repeat IAPs, including "Whales".

To address this matter, this study will aim to examine the significant factors predicting mobile games players' willingness to make actual IAP. As an alternative to the purchase intention-based approach to IAP behavior, this study will employ the novel construct Perceived Aggressive Monetization (PAM) (Salehudin & Alpert, 2022). This study will look into the impact of PAM on IAP behavior using the variables of Previous Impulsive Spending, Self-Control, users' willingness to spend on IAP, and size of actual spending on IAP. Moreover, this study provides managerial implications by emphasizing the influence of Perceived Aggressive Monetization (PAM) on IAP behavioral patterns. This study will also enrich the current body of literature on mobile games IAP, which was mostly addressed through the lens of purchase intention.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Perceived Aggressive Monetization (PAM)

Perceived Aggressive Monetization (PAM) is the subjective understanding of users that an application's business model places excessive emphasis on generating financial profits, which may potentially harm the users' general welfare (Salehudin &

Alpert, 2022). Using fairness theory (Seiders & Berry, 1998) and psychological reactance (McCoy et al., 2017) as frameworks, Salehudin & Alpert (2022) investigated and advanced the notion of "Perceived Aggressive Monetization" (PAM).

The PAM construct consists of five dimensions: manipulativeness, addictiveness, riskiness, intrusiveness, and overpricing. These dimensions cover a wide range of factors that contribute to the overall perception of aggressive monetization. Salehudin & Alpert (2022) define manipulativeness as users' perception of the extent to which they are being manipulated, resulting in more actual purchases. Perceived addictiveness pertains to the inclination of users to develop an addiction to real Internet application products (IAPs) after making any actual purchases (Salehudin & Alpert, 2022). Perceived intrusiveness arises when users suspect that the app prioritizes monetized content without their knowledge or consent, while perceived overpricing is the condition in which players are conscious of the fact that the in-game products are overly expensive (Salehudin & Alpert, 2022). Lastly, in gaming, perceived riskiness refers to the users' perception that the probability of achieving specific in-game goals is unreasonably small (Salehudin & Alpert, 2022).

Self-Control

Self-control refers to an individual's ability to regulate their emotions and actions. According to Baumeister (2002), this includes replacing an emerging response pattern with an alternate one. Responses to distractions can involve thoughts, emotions, impulses, and performances.

In the context of consumer spending, self-control was described by Haws et al. (2012) as the ability to monitor and regulate one's own thought processes and financial expenditure decisions in accordance with self-imposed standards. This deeper comprehension may result in the development of practical strategies to assist consumers in controlling their spending so they can prevent the detrimental effects of uncontrolled spending on their finances (such as bankruptcy and bad credit), their psychological well-being (such as stress, guilt, and anxiety), and their social lives (such as strained relationships and divorce).

Previous Impulsive Spending

Previous impulsive expenditure refers to customers' past in-app purchases (IAPs) (Salehudin & Alpert, 2022). This previous impulsive purchasing can have an impact on players' present attitudes and actions toward IAPs, such as their desire to pay and self-control when making future purchases. Salehudin & Alpert (2022) suggested that in-app purchases (IAPs) are more impulsive rather than rational purchases. Users often make IAPs spontaneously without prior intent or planning, indicating impulsive spending behavior. While some users may set specific spending limits beforehand, they may still exceed these limits due to the impulsive nature of IAPs. According to Salehudin & Alpert (2022) research of user comments and interview data, consumers do not have a preset aim or plan when making IAPs.

Willingness to Spend on IAP

According to Salehudin & Alpert (2024), willingness to spend refers to a user's maximal monetary allocation for in-app purchases over a given time period. Salehudin & Alpert (2024) identified Willingness to Spend as an independent variable in explaining why people choose not to pay IAP. This enhances the measuring of IAP spending by users and the comprehension of the factors influencing IAP behavior.

Additionally, Salehudin & Alpert (2024) proposed that since purchases may be made while a player is playing, the willingness to spend notion is better suited for analyzing IAP than willingness to pay (WTP). According to the WTP model, customers often only make a single purchase at the start, as is the case with classic console video games, when users buy the game title up front before starting to play through to the end.

Size of Spending on IAP

Salehudin & Alpert (2024) refers the size of spending on IAP as the actual amount of money customers decide to spend on extra features, content, or improvements in a mobile game. Generally speaking, the "size of spending" refers to the total monetary worth of these user-made transactions, which can differ greatly from person to person. While some players, who are frequently referred to as "whales," may spend large sums of money on IAP, others may spend very little or nothing at all. For game developers and publishers, knowing how much money is being spent is essential since it allows them to better evaluate user behavior, enhance monetization tactics, and increase overall income production.

The influence of PAM on Willingness to spend

Perceived unfairness by users impacted their willingness to pay (Ajzen et al., 2000). Customers have regulated themselves to adopt more utilitarian behaviors as a result of retailers' persistent and constant attempts to solicit online sales (Ayadi et al., 2013). In the setting of mobile game, Salehudin & Alpert (2022) suggested that users' reluctance to make IAP reduces their overall purchase spending. PAM significantly reduces users' willingness to spend actual money on mobile game IAPs (Salehudin & Alpert, 2022). Users who view the app's monetization strategy as aggressive are less likely to buy in-app items, reducing their IAP spending. A mobile game's aggressive monetization can have a negative impact on purchase intention by creating a perception of risk and unfairness, discouraging players from engaging in transactions (Petrovskaya & Zendle, 2022a). Therefore, this research sets a hypothesis as follows:

H1: PAM negatively influences Willingness to spend.

The influence of Previous impulsive spending on PAM

According to Salehudin & Alpert (2022), actual in-app purchases are usually

the result of acting without considering. The study looked at what users said about the games they played and found that many of them made in-app purchases (IAPs) that they probably were not intending to. This finding indicates the existence of prior impulsive buying inclinations among players. Producers of video games have implemented strategies that users perceive as encouraging recurring purchases (King et al., 2019). Petrovskaya et al. (2022b) found out that players with history of in-game purchases reported financial impacts when engaged in IAPs, leading to feelings of being taken advantage of. Spending for "Loot box", one kind of IAP mechanism, among problem gamers may be considered part of the problem gaming syndrome (Delfabbro & King, 2020). Some IAP tactics may boost revenue temporarily, but they also increase player churn, dissatisfaction, and unfavorable perceptions of the game (Debnath, 2024). Users who have a history of impulsive behavior will think twice to make more in-app purchases, as they view them as highly aggressive monetization. Therefore, this research sets a hypothesis as follows:

H2: Previous Impulsive Spending has a positive effect on PAM.

The influence of Previous impulsive spending on Willingness to spend

Yuliawan et al. (2024) stated that initial purchase intention had a significant positive impact on consumers' repeat purchase intent. Prior shopping experience on e-commerce platforms influences purchase intention, because consumers' familiarity with discount framing and brand reputation improves their decision-making process (Tarmizi et al., 2024). Previous purchase experiences generally enhance purchase intentions, negative experiences can lead to cognitive dissonance, potentially deterring future purchases (Wagan & Sidra, 2024). Digital shoppers' anxiety levels can be considerably raised by negative experiences in the prior spending, like damaged goods, lengthy delivery times, and inadequate packaging, this perceived anxiety could discourage them from making subsequent purchases in the app (Widayat & Irfani, 2020). In digital marketplaces, negative post-purchase reactions like regret, anger, and guilt have a significant impact on consumers' future in-app purchases (Zhao et al., 2023). Mobile game players may become more cautious to spend again after making impulsive IAP purchases, particularly if the results do not match their expectations or the results become very uncertain, leading to negative perceptions. Users' previously-made impulsive IAP buying negatively impacts on users' future willingness to spend. Therefore, this research sets a hypothesis as follows:

H3: Previous Impulsive Spending has a negative effect on willingness to spend.

The influence of Self-control on PAM

Self-control refers to the ability to manage emotions, thoughts, and behavior to

improve one's current situation (Soroush et al., 2014). According to Salehudin & Alpert (2022), users with higher self-control may perceive the game's business model as aggressively monetized, potentially harming users' overall well-being. Han et al. (2021) demonstrated that improving self-control might change how users perceive aggressive monetization tactics. Impulsive buying behavior is negatively impacted by consumers' self-control, making them less vulnerable to aggressive marketing strategies (Wang et al., 2022). Higher self-control may result in a more critical perception of aggressive monetization strategies, potentially reducing impulsive purchasing behavior in response to such marketing efforts (Mulyono & Rusdarti, 2020). Therefore, users exhibiting self-control might evaluate the unfairness related to aggressive monetization tactics, such as overpricing or manipulative gameplay system that is employed to promote actual IAP spendings. Therefore, this research sets a hypothesis as follows:

H4: Self-control has a positive effect on PAM.

The influence of Self-control on Willingness to spend

People with higher self-control are more likely to be able to control their spending habits and make decisions that align with their financial goals (Haws et al., 2012). There is a significant correlation between self-control and the amount of money spent on game purchases (Soroush et al., 2014). Self-control has a significant negative impact on consumer behaviour in the setting of social e-commerce such as TikTok Shop (Maharani & Adnans, 2024). Among career women, self-control mitigates the impact of a shopping lifestyle on impulsive purchases, indicating that greater self-control may result in more frugal spending habits (Apidana & Kholifah, 2022). Self-control can reduce impulsive buying tendencies, so the more self-control one possesses, the less likely one is to make impulsive purchases (Febriandika et al., 2024). Research indicates that individuals with lower self-control tend to spend more money in games due to depletion of their self-control capacity. Therefore, this research sets a hypothesis as follows:

H5: Self-control has a negative effect on willingness to spend.

The influence of Willingness to spend on Size of spending

Players' willingness to spend positively affects the amount of financial spending on IAP since users with a higher willingness to spend are more likely to become IAP buying users. Howard & Lukas (2021) demonstrates a finding that budgets have a significant economic impact on consumer spending. Implementing budgeting practices can successfully affect consumer expenditure (Skwara & Wienert, 2024). Budget planning exerted a significant positive impact on financial expenditure (Maina & Waweru, 2024). In terms of tourism industry, tourist spendings are

determined by their willingness and ability to spend (Alfarhan et al., 2022). Users with a high propensity to spend are more likely to convert to paying customers of IAP (Salehudin & Alpert, 2022). The size of a players' purchases is positively correlated with their willingness to spend. Players who are more open to paying for in-app purchases are also more likely to repurchase and spend more money overall. Therefore, this research sets a hypothesis as follows:

H6: Willingness to spend positively influences size of spending.

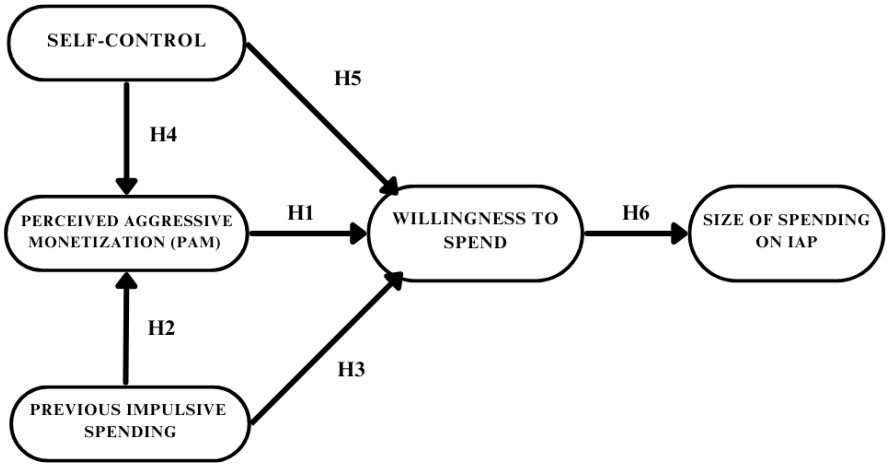

Figure 1
Research Model

RESEARCH METHOD

Sample and Data Collection

The participants as the sample of our research consisted of Indonesian mobile game players, who played game titles employing IAP as the monetization model, specifically those featuring the gacha system. Gacha games allow players to get the character or item they want in free-to-play games by paying with in-game currency to enter a draw, similar to a lottery (Lakić et al., 2023). Mobile games involved in this research were titles employing gacha system like Genshin Impact, Honkai Star Rail, Honkai Impact 3rd, Arknights, and Ragnarok Online Global. The samples consisted of players coming from the age group of millennial and generation Z. For this research, following Hair et al. (2017), a minimum number of 200 samples were needed. The sampling criteria were based on purposive sampling. In this way, it can be ensured that the sample was selected according to predetermined standards. Mobile gamers who had spent real money on in-game items in the past were chosen as the research respondents. This data collecting procedure utilized questionnaire with a five-point Likert scale consisting of the following points. The five-point Likert scale consists of the following response options: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree.

PLS-SEM was used as the measurement model for this study. The data were analyzed using SmartPLS 4. PLS-SEM was used because the variable Perceived Aggressive Monetization (PAM) is viewed as a formative construct. According to Hair et al. (2017), PLS-SEM was well-suited for model measurement when it involves one or more formative construct, so PLS-SEM was employed to analyze the model.

Operational definitions and research indicators

To provide the operational definitions and research indicators, table below is presented.

Table 1
Operational definitions and research indicators

Variable	Definitions	Code	Indicators
Self-control (Tangney et al., 2004)	The capacity to control or surpass one's inner reactions, including urges, desires, and feelings, in order to achieve long-term goals. It involves the ability to delay gratification, resist temptation, and inhibit prepotent responses.	SC1	Good at resisting temptation.
		SC2	People see me as impulsive.
		SC3	Spend too much money.
		SC4	Tend to do things in the spur of the moment.
		SC5	I often act without thinking through all the alternatives.
Perceived Aggressive Monetization (PAM) (Salehudin & Alpert, 2022)	Subjective perception of users wherein they perceive that an application's business model excessively prioritizes the pursuit of financial gains, potentially compromising the users' overall well-being. PAM consisted of 5 dimensions as follows: manipulativeness, addictiveness, riskiness, intrusiveness, and overpricing (Salehudin & Alpert, 2022)	PAMM1	IAP in this app is manipulative.
		PAMM2	IAP in this app tries to take advantage of users.
		PAMM3	IAP in this app is insecure.
		PAMA1	IAP in this app is addictive.
		PAMA2	IAP in this app is making the user dependent.
		PAMA3	IAP in this app is making the user's spending increase.
		PAMR1	IAP in this app is too risky.
		PAMR2	IAP in this app has uncertain outcomes.
		PAMR3	IAP in this app is like gambling.
		PAMI1	IAP in this app is intrusive.
		PAMI2	IAP in this app is interfering.
		PAMI3	IAP in this app is distractive.
		PAMO1	IAP in this app is overpriced.
		PAMO2	IAP in this app is not worth the money.
		PAMO3	IAP in this app is priced unreasonably.
Previous Impulsive Spending (Salehudin & Alpert, 2022)	Previous Impulsive spending refers to prior spending that users find the purchase spontaneously or without planning (Salehudin & Alpert, 2022).	PIS1	IAP with limited value related to money spent.
		PIS2	Addicted to IAP in last 3 months.
		PIS3	Too much money spent for IAP in last 3 months.
Willingness to Spend on IAP (Salehudin & Alpert, 2022)	Maximum amount of money the user is willing to commit in a given period of time for in-app purchases (IAPs) (Salehudin &	WTS	Maximum money willing to spend in a week.

Variable	Definitions	Code	Indicators
	Alpert, 2022)		
Size of Spending on IAP (Salehudin & Alpert, 2022)	The amount of money a user spends on IAP after deciding to convert from a free to paying user. (Salehudin & Alpert, 2022)	SSI	Money spent on IAP last week in a month.

Source: Previous research.

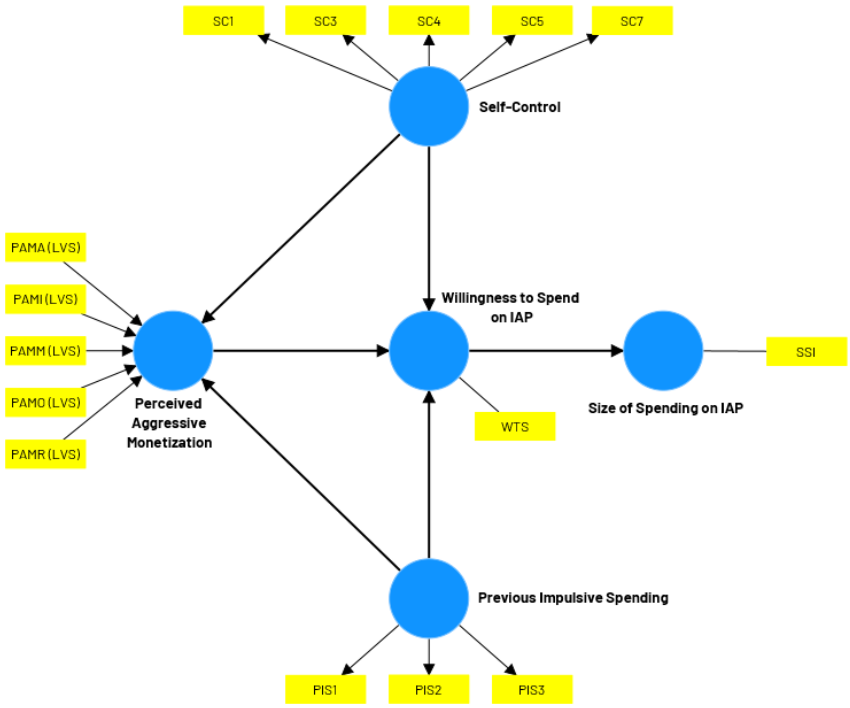

Figure 2
Result of PLS-SEM

The five dimensions that comprise the PAM construct are manipulativeness, overpricing, riskiness, intrusiveness, and addictiveness. These dimensions cover a wide range of factors that contribute to the overall perception of aggressive monetization. Given that the Perceived Aggressive Monetization (PAM) as a part of the research model is a formative construct, two-stage approach with reflective-formative higher-order construct measurements will be employed. The three indicators from each PAM dimension will be replaced by a single indicator based on the latent variable (LV) scores, then the single indicator acts as a proxy for the each of the five PAM dimensions. Therefore, there will be five indicators for the PAM variable representing the five dimensions.

ANALYSIS AND DISCUSSION

After the survey was completed, 282 respondents participated in data

collection, which was followed by data screening, and a total of 264 respondents provided the research data. Data was collected using Google Forms. The respondents are listed in the table below, sorted by demographic.

Table 2
Respondent Profiles

Profile	Options	Frequency	Percentage
Ages	12 – 27 years old	212	80.30%
	28 – 43 years old	52	19.70%
Residences	Banten	180	68.18%
	West Java	22	8.33%
	Central Java	6	2.27%
	East Java	6	2.27%
	Lampung	1	0.38%
	Jakarta	42	15.91%
	South Sumatra	1	0.38%
	South Sulawesi	3	1.14%
	Bali	2	0.76%
	Yogyakarta	1	0.38%
Occupations	Students	191	72.35%
	Employees	56	21.21%
	Entrepreneurs	13	4.92%
	Professionals	4	1.52%
Playing duration	< 1 hour	41	15.53%
	1 – 3 hours	170	64.39%
	> 3 hours	53	20.08%
Playing Frequency	Daily	68	25.76%
	2 – 5 times a week	150	56.82%
	Once a week	46	17.42%
Playing time	In the morning	10	3.79%
	In the midday	15	5.68%
	In the afternoon	31	11.74%
	In the evening	208	78.79%
Total Respondents		**264**	**100%**

Source: Data processing by authors

The respondents ranged in age from 12 to 43 years old, with 80.30% falling into the 12 to 27 years old, with 19.70% were between the ages of 28 and 43. Around 180 respondents (68.18%) were from the Banten area. In terms of occupational profiles, the respondents mostly were students, accounting for 191 respondents (72.35%). A total of 170 respondents (64.39%) reported playing for 1 to 3 hours per day. Around 150 people (56.82% of the 264 respondents) said they played mobile games two to five times per week. The majority of respondents (208 or 78.79%) claimed to play mobile games in the evenings.

Measurement Model Analysis

According to Hair et al. (2017), the measurement model analysis examines the following aspects for each reflective variable: construct validity (outer loadings and AVE), construct reliability (Cronbach's Alpha and composite reliability), and discriminant validity (Fornell-Larcker Criterion and Cross loadings).

Construct Validity

The loading factor values examined with SmartPLS 4 are shown in Table 3 below.

Table 3
PLS-SEM Algorithm Outer Loading Results

Indicators	Outer loadings
PAMA → Perceived Aggressive Monetization	0.832
PAMI → Perceived Aggressive Monetization	0.931
PAMM → Perceived Aggressive Monetization	0.932
PAMO → Perceived Aggressive Monetization	0.907
PAMR → Perceived Aggressive Monetization	0.945
PIS1 ← Previous Impulsive Spending	0.919
PIS3 ← Previous Impulsive Spending	0.912
PIS4 ← Previous Impulsive Spending	0.908
SC1 ← Self-control	0.854
SC2 ← Self-control	0.930
SC3 ← Self-control	0.779
SC4 ← Self-control	0.804
SC5 ← Self-control	0.877

Source: PLS-SEM algorithm.

Standardized outer loading values should be at least 0.708 (Hair et al., 2014). Following the process of PLS-SEM algorithm has been done. The outer loadings of the indicators show satisfactory value > 0.708.

Construct Reliability

Cronbach's Alpha assesses the degree to which all items on a scale measure the same underlying construct by examining how closely related a group of items is to one another. According to (Hair et al., 2017), Composite reliability is a measure of how well a construct's indicators collectively capture the underlying latent variable. Composite reliability values greater than 0.6 are deemed acceptable.

Table 4
Research Construct Reliability Results

Indicators	Cronbach's Alpha	Composite Reliability	Average Variage Extracted (AVE)
Previous Impulsive Spending	0.900	0.901	0.834
Self-control	0.904	0.913	0.723

Source: PLS-SEM algorithm running results by authors

Hair et al. (2017) recommend Cronbach's Alpha > 0.7 for reliability. Cronbach's Alpha values for each table variable are reliable. The table shows satisfactory composite reliability measurements for all constructs. Furthermore, supporting construct validity is a higher AVE value, usually above 0.5. Based on the values shown in the table above, the AVE points of every construct are regarded as valid since they are all more than 0.5.

Discriminant Validity

According to Hair et al. (2017), discriminant validity assesses how much a

construct differs from other constructs in the model. Discriminant validity is typically evaluated using indicators' cross-loadings and the Fornell-Larcker criterion. Cross loading measurements have been conducted, and the outcomes are displayed in the table below.

Table 5
Cross Loading Measurement Results

Indicators	Perceived Aggressive Monetization	Previous Impulsive Spending	Self-control	Size of Spending	Willingness To Spend
PAMA	**0.824**	0.757	0.771	0.098	-0.050
PAMI	**0.941**	0.826	0.845	0.036	-0.207
PAMM	**0.928**	0.802	0.841	0.066	-0.208
PAMO	**0.900**	0.777	0.799	-0.028	-0.244
PAMR	**0.947**	0.819	0.852	-0.002	-0.224
PIS1	0.809	**0.919**	0.767	-0.004	-0.201
PIS3	0.806	**0.912**	0.796	0.007	-0.203
PIS4	0.764	**0.908**	0.720	-0.028	-0.148
SC1	0.792	0.788	**0.854**	0.051	-0.156
SC2	0.850	0.821	**0.930**	0.006	-0.205
SC3	0.661	0.542	**0.779**	0.076	-0.055
SC4	0.693	0.565	**0.804**	0.055	-0.097
SC5	0.811	0.788	**0.877**	0.009	-0.084
SSI	0.020	-0.009	0.043	**1.000**	0.525
WTS	-0.235	-0.202	-0.145	0.525	**1.000**

Source: PLS-SEM algorithm

The above table shows that each indicator loaded higher on the intended construct than on other constructs (in bold). Cross loading analysis shows that this study's indicators have good discriminant validity.

Table 6
Fornell-Larcker Criterion Results

	PIS	SC	SSI	WTS
Previous Impulsive Spending	**0.913**			
Self-control	0.835	**0.850**		
Size of Spending on IAP	-0.009	0.043	**1.000**	
Willing to Spend on IAP	-0.202	-0.145	0.525	**1.000**

Source: PLS-SEM algorithm.

All bolded table values above exceed any associated construct. The results show that all model variables are discriminant.

Structural Model Test

According to Hair et al. (2017), R^2 value represents the variance ratio of an endogenous latent variable compared to its exogenous latent variables in the model. Higher values of the R^2 value indicate higher levels of predictive accuracy, the range is 0 to 1. Endogenous constructs with R^2 values of 0.75, 0.50, or 0.25 correspond to substantial, moderate, and weak, respectively. Table 7 below shows the coefficient of determination.

Table 7
Coefficient of Determination

Variables	R^2	R^2 adjusted
PAM	0.856	0.855
SSI	0.276	0.276
WTS	0.076	0.089

Source: PLS-SEM algorithm running results by authors

Based on the R^2, the construct representing the PAM has 0.856 explained variance, whereas the construct representing the WTS variable has only 0.076. The Size of Spending on IAP (SSI) has an R^2 value of 0.276. These findings indicate that the five dimensions (PAMM, PAMA, PAMR, PAMI, and PAMO) influence 85.6% of the PAM variables. The remaining 14.4% is influenced by variables other than the research model.

Next, the SC, PAM, and IS influence 7.6% of the WTS variable. There are variables outside of the research model that influence the 92.3%. The WTS variable influences 27.6% of the SSI variable, while the remaining 70.40% is influenced by constructs outside of the research model.

Hypothesis Testing

In this research, 6 hypotheses have been developed and the next step is testing them by using SmartPLS Bootstrapping procedure. This research employed hypothesis testing to assess the significance of the relationships between the constructs. The hypothesis test, as described by Hair et al. (2017), involves comparing the observed t statistics with a critical value obtained from the normal distribution. An observed t value greater than the critical value indicates that the coefficient is statistically significant at a certain level of error probability, referred to as the significance level. P value will be calculated to establish the significance between constructs. A P value below 0.05 will be considered statistically significant. The path coefficients in the structural model indicate the strength and direction of the causal relationships.

Below is the table presenting the results of hypothesis testing. Based on the hypothesis testing results below, it can be concluded that out of 6 hypotheses, 4 are supported and 2 are not supported.

Table 8
Hypothesis Testing Results

Hypotheses	Paths	Path Coefficient	T statistics	P values	Conclusion
H1	PAM → WTS	-0.517	1.752	0.040	Accepted
H2	PIS → PAM	0.387	6.477	0.000	Accepted
H3	PIS → WTS	-0.078	0.621	0.267	Rejected
H4	SC → PAM	0.578	9.159	0.000	Accepted
H5	SC → WTS	0.384	1.500	0.067	Rejected
H6	WTS → SSI	0.525	6.216	0.000	Accepted

Source: SmartPLS bootstrapping.

DISCUSSIONS

The finding from H1 aligns with the previous research by Salehudin & Alpert (2024) and Petrovskaya & Zendle (2022a) that PAM significantly reduces mobile game players' willingness to spend money for in-game item purchases, attributed by path coefficient of -0.517 and P value of 0.040 (<0.05), as can be seen in the table above. Players of mobile games who perceive the monetization model of the mobile games as aggressive are more likely to lower the amount of money they are willing to spend on IAP, which will ultimately lead to a reduction in their overall actual IAP spending. Customers' willingness to spend is highly influenced by the perceived unfairness of the monetization model.

Meanwhile, findings have shown that both previous impulsive spending (PIS) and Self-control (SC) are strengthening players' perception of aggressive monetization of the mobile games they play (H2 and H4). The H2 result is consistent with the research finding by Salehudin & Alpert (2022), which holds that players' prior unfavorable IAP spending, plays a significant role in raising their perception of aggressive monetization of the in-game IAP system, which in turn lowers their actual IAP purchases. H4 finding is in line with previous research (Han et al., 2021; Mulyono & Rusdarti, 2020; Wang et al., 2022). This underlined how crucial it is to comprehend player attitudes and actions in connection to mobile game monetization tactics.

Despite it has a negative impact on players' willingness to spend on IAP as stated in the hypothesis, research statistics show that prior impulsive IAP spending has not significantly affected players' willingness to spend (H3). This finding is not consistent with prior studies (Wagan & Sidra, 2024; Widayat & Irfani, 2020; Yuliawan et al., 2024; Zhao et al., 2023). This implies that players who have previously made impulsive in-app purchases may not be deterred from IAP spending in the future. This is an important consideration for game developers when implementing IAP revenue-generating strategies.

The H5 hypothesis is not supported with the path coefficient of 0.344 and the P value of 0.068, while the t statistics numbered to 1.494, which is not in line with the findings of previous research (Apidana & Kholifah, 2022; Febriandika et al., 2024; Maharani & Adnans, 2024). The present findings demonstrate that responsible players are still open to making IAPs, albeit at a lower and more regulated payout. It would seem from these players who are disciplined in their IAP behavior can withstand the urge to spend excessive amounts of money on in-app purchases. This behavior could be associated with a strong commitment to budgeting or a conscious effort to reduce spending on recreational activities.

The size of IAP spending is positively influenced by willingness to spend (H6). This study validates the hypothesis's acceptability using a path coefficient of 0.525 and P values of 0.000. The T statistic is 6.216. This study confirmed that the more users are willing to spend real money on IAP, the larger the actual size of in-game spending.

This finding is consistent with the research findings of Salehudin & Alpert (2022), who discovered that willingness to spend increases the size of spending on IAP. The amount users are willing to spend correlates positively with the size of their purchases, which also correlate with the research by Alfarhan et al. (2022) and (Maina & Waweru, 2024).

Table 9
Specific Indirect Effect Test

Path	Path Coefficient	T statistics	P value	Conclusion
PAM → WTS → SSI	-0.251	1.742	0.041	Accepted

Source: SmartPLS bootstrapping

Table 9 shows the testing of specific indirect effect test of Perceived Aggressive Monetization for Size of Spending on IAP with the willingness to spend as the mediating variable. Based on the yielded P value of 0.041 (< 0.05), the perceived aggressive monetization impacted users' size of spending through the mediating effect of willingness to spend.

Perceived Aggressive Monetization (PAM) on Actual IAP Spending

As the present research findings demonstrated the significance of players' perception of aggressive monetization, mobile game studios must assess the extent that players begin to perceive being aggressively monetized in their games. Mobile game users who perceive the application's monetization strategy as aggressive are more likely to limit their monetary willingness for IAP, resulting in a decrease in actual IAP spending, including losing devoted players and "whales", or high-spenders. This finding aligns with (Salehudin & Alpert, 2022). Consumers' willingness to spend is strongly influenced by their perception of unfairness. If players believe in-app purchases are unfair or forced, they may seek out other games with less aggressive monetization models.

Mobile games, especially those with gacha elements, depend heavily on IAP, but monetization tactics can be unfair or exploitative and are not adequately regulated (Petrovskaya & Zendle, 2022b), which become a growing concern over IAP model. This research suggests mobile game developers to implement mechanics that reduce players' addictiveness, such as budget-limiting mechanisms that remind players of their spending. After spending a certain amount of IAP, players may be reminded of their limit. Players can enjoy the game without financial strain or addiction. Teenage players can avoid overspending with parental control system. Furthermore, player feedback on monetization strategies will be considered to determine if players feel overmonetized.

Based on the highest outer loading score yielded from five PAM dimensions, which is the perceived riskiness, the suggestion is for mobile game studios to value players' IAP spending. As highlighted by Lakić et al. (2023), *gacha* games, which became the game titles involved in this study, are both entertaining and risky due to the significant time

and financial commitment the they demand. To mitigate the perceived risk, mobile game publishers should provide fair value for their players' IAP spending. Mobile game publishers can balance and reward in-game economies by rewarding players for IAP spending.

CONCLUSIONS, LIMITATIONS AND SUGGESTIONS

The findings of this study have demonstrated that Perceived Aggressive Monetization (PAM) has a substantial influence on players' inclination to purchase mobile game IAPs. Of the 3 constructs employed in this research, besides players' self-control and previous impulsive IAP spending, PAM became the antecedent to predict mobile game users IAP behavior. At the same time, research shows that players' perceptions of aggressive monetization tactics in mobile games are getting stronger due to both self-control and prior impulsive IAP spending.

This study provides empirical evidence to support the idea that the concept of Perceived Aggressive Monetization (PAM) can be used to predict In-app Purchase (IAP) behavior, which has not been extensively studied. This research adds to the existing literature by incorporating a novel construct, PAM, which may influence consumer behavior in the context of mobile app purchases. Utilizing PAM alongside other established determinants, researchers can gain a more comprehensive understanding of the factors that motivate users to make In-app Purchases.

Future research can examine other mobile game app genres. As this study is limited to *gacha*-enabled mobile games, future research could examine mobile games with IAP in genres like battle royale, shooting, or other genres implementing *PvP* (player versus player) systems, where players are more likely to spend money on IAP to gain competitive edge. Titles with large player bases and revenue can be prioritized. This research specifically investigated the patterns of IAP in mobile gaming applications, therefore offering opportunities for further study on other categories of mobile applications that employ IAP as their monetization strategy.

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