

The Effect of Using Game Dynamics Towards Employee Work Engagement: An Empirical Study in Indonesia

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Abstract

This research aims to examine and analyze the positive effects of game dynamics towards intrinsic motivation and enjoyment, the positive effect of intrinsic motivation towards enjoyment and work engagement, the effect of positive enjoyment towards work engagement, as well as the positive effect of game dynamics towards work engagement. This research uses Self Determination Theory and gamification strategy to explain the relationship between variables. The data was collected from 226 permanent employees of Startup companies located in Yogyakarta, Indonesia through questionnaire distribution. The obtained data was analyzed using the AMOS Structural Equation Modeling (SEM) model. The assessment of this questionnaire uses 5-point Likert scale. The results show that game dynamics has a positive effect towards intrinsic motivation as opposed to enjoyment, intrinsic motivation has a positive effect towards enjoyment as opposed to work engagement, and finally, enjoyment and game dynamics have a positive effect towards work engagement. The theoretical implication is that this research fills the research gaps regarding the antecedents and consequences of Self-Determination Theory. Finally, this research proposes several solutions to relevant problems on how companies and organizations need to implement game dynamics to positively affect employees' behavior, especially from intrinsic motivation, work engagement, as well as enjoyment.

Keywords: Self Determination Theory, Gamification, Game Dynamics, Intrinsic Motivation, Enjoyment, Work Engagement

JEL Classification Code: M2, M15, O15

1. Introduction

Gamification is an interesting phenomenon for practitioners and authors. However, there is still uncertainty on this research field's direction due to its use as "the process of making activities similar to games" (Werbach, 2014). According to Sobocinski (2017), this research offers numerous solutions to the activities that have not been tested properly. Gamification in industrial or work fields is still new

because most of its process is widely applied in education and training fields. Therefore, this research uses the literature of works or industrial fields linked with observations taken from the gamification elements in reality, to develop game dynamics by connecting employees' intrinsic motivation to increase enjoyment and work engagement.

This research develops a theoretical model to examine employee engagement which intrinsically motivates to apply game dynamics using the Self Determination Theory (SDT) framework. According to Deci & Ryan (2000) and Deci et al. (1994), SDT is a widely studied macro theory of human motivation that showed that people are more likely to be engaged in an activity when they are intrinsically motivated. In conclusion, it is the ability to control individual behavior where decisions are not affected by external factors that tend to seek new knowledge about themselves, which is later applied in activities related to others.

This research identifies the factors that make people intrinsically motivated and feel a certain activity is enjoyable (Suh, 2015). Schiemann (2011) stated that users play games for enjoyment and to have a good experience. Wang and Lieberoth (2016) stated that engagement and motivation

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have a positive effect on employees. The perceived ease of use positively affects enjoyment (Rodrigues et al., 2016), while motivation and engagement play a significant role in interest and enjoyment (Martin, 2006).

According to preliminary studies, there is a result uncertainty of using elements in-game dynamics. This is because most study produces positive effects, and on the other hand, it also shows negative results (Hamari et al., 2013) due to the positive effect of multiple users for a short time (Farzan et al., 2008). The use of game dynamics is conceptually uncertain (Landers & Landers, 2014) due to the failure to explain the antecedents of engagement, mechanisms, and impacts (Kaushik et al., 2014).

This research uses employees of a startup Limited Liability Company (PT) located in Yogyakarta. Based on the survey results, data from the startup company's latest technology were used to develop digital products, especially in the sub-sectors, such as e-commerce, fintech, gaming, applications or software, internet service providers, consultants, training, etc (Bekraf, 2018). For this particular research, start-up companies have been used as these companies require to set targets for employees and motivate them in order to achieve those targets. Therefore there is a need for engagement in the organization.

The shortcomings of empirical research showed a broad belief in game dynamics' benefits by producing assessments that are often vague and pessimistic (Burke, 2014). The inconsistency evidences this regarding the impact on user engagement created by gamification elements, such as points, levels, badges, and leaderboards (Lee & Yang, 2011). According to Huang et al. (2015), this leads to excessive competition, which negatively affects motivation. Hanus and Fox (2015) stated that there are negative effects on motivation, satisfaction, empowerment, and performance (Heijden, 2004). Furthermore, Kyewski & Krämer (2018) reported that game dynamics elements have no impact on motivation, activity, or performance. Gamification elements have a negative effect on intrinsic motivation (Deci et al., 2001), such as the low motivation of early users towards game dynamics (Pesare et al., 2016).

2. Literature Review

2.1. Self Determination Theory (SDT)

Self Determination Theory (SDT) is a widely studied macro theory of human motivation, which shows that people tend to be highly engaged in activities when they are intrinsically motivated (Deci & Ryan, 1985; Deci et al., 1994). It found that 1) people are inherently motivated to weaken unattractive regulations despite important activities, 2) there are two distinct processes associated with the occurrence of such internalization, thereby leading to qualitatively different styles of self-regulation, and 3) social

context affects the internalization process and setting style applied (Deci & Ryan, 1985; Deci et al., 1994). SDT generally applies to activities that people find enjoyable, optimally challenging, or aesthetically pleasing. The inexperienced activity, such as "work," is not possible unless there is some extrinsic reason for conducting the process (Deci & Ryan, 2002; Temblay et al., 2009).

2.2. Gamification

The gamification strategy assumes that when an organization makes a task accomplishment similar to playing a game, employees are intrinsically motivated by the challenge to invest sustained effort in their work (Perryer et al., 2016). Various game elements have been applied in a non-game context to increase employee motivation to achieve organizational goals (Perryer et al., 2016). Gamification has the potential to increase motivation by providing employees with experiences that satisfy universal psychological needs in examining its effects on performance and satisfaction needs. Perryer et al. (2016) further stated that games significantly contribute to transparency and fairness in the workplace. Therefore, Gamification eases the workers' abilities to get feedback on their performance compared to others and whether they need to make corrections in performance.

2.3. Game Dynamics

Game dynamics is defined as a way to make work enjoyable (Schonfeld, 2010; Suh et al., 2015; Bunchball, 2014; Neeli, 2012). This is based on social collaboration and competition among players, reinforcement in the form of advances on games for decision making, and actions governed by social and collaborative rules (Tu et al., 2015). It forms the reasons behind users' motivational behavior towards game mechanics. According to Matallaoui et al. (2017), it is very important for game designers and game dynamics to target and fulfil different users' shared desires.

2.4. Game Dynamics and Intrinsic Motivation

The use of points, levels, and leaderboard enable employees to choose the activities to carry out and increase their ability to interact with other gamified system participants. These elements are expected to understand progress and foster a sense of competition (Suh et al., 2015). According to Hamari and Sarsa (2014) and Seaborn and Fels (2015), these elements have been applied to a broad spectrum of non-gaming contexts with varying success degrees. The effectiveness of the game dynamics approach in facilitating user motivation is context-dependent. Several contextual game dynamics mechanics, such as leaderboard, achievement, and level, make inferences on the specific

effects of more difficult gamified features (Perryer et al., 2016). Intrinsic motivators tend to be a function of the job design and the workers' values or interests.

Deterding (2015) stated that the use or implementation of game elements, such as points, levels, and the leaderboard, is suitable for a particular context. There is an effect between game dynamics on intrinsic motivation because it has several indicators, such as an integrated performance appraisal system, performance-based point's implementation, good employee status, output-based work performance, and employee ownership of the company. This is because it is based on a system that the company has implemented in assessing performance and social status. Therefore, employees are motivated to create a pleasant work atmosphere using the game dynamics application.

H1: Game dynamics positively affect intrinsic motivation.

2.5. Game Dynamics and Enjoyment

Various mechanism elements have been built to increase enjoyment and greater playfulness in activities (Reiners & Wood, 2015; Mulcahy et al., 2018). This is because enjoyment is also important to ensure users continue to use gamified applications to increase knowledge. Enjoyment refers to users' emotional playfulness interacting with gamified applications as measured through perceived enjoyment or pleasure and proven to affect intention (Mulcahy et al., 2018).

User personalities accurately predict enjoyment levels from several widely used game design elements, such as levels, points, leaderboard, avatars, quests, or challenges (Jia et al., 2016). This is in line with the research carried out by Hunicke et al. (2004), which explains the reason game elements make people feel enjoyment. According to Jia et al. (2016), people's personality traits are related to perceived preferences from various motivational opportunities widely used in the gamification system. The findings suggest that personality traits play a role in people's perceived preferences on game dynamics and highlight opportunities to engage with the users.

Enjoyment is indicated by a pleasant work experience, which employees use in addition to game dynamics elements to attract comfort, happiness, and exceptional work patterns. Employees have the convenience in working, therefore they are motivated to improve their performance and contribute to the company.

H2: Game Dynamics positively affects enjoyment.

2.6. Intrinsic Motivation and Enjoyment

Intrinsic motivation refers to motivation from within a person, such as enjoyment rather than from any external

reward (Ryan & Deci, 2000; Suh, 2015). Autonomy is a sense of willingness when performing a task (Deci & Ryan, 2000), competence is the feelings of effectiveness (van der Heijden, 2004), and connectedness is the feelings of being connected with others (Gatautis et al., 2016). In this regard, it has been suggested that providing game-based dynamics such as rewards stimulates intrinsic motivation (Suh, 2015).

Game dynamics need to overcome intrinsic motivation using a mechanism, thereby creating a sense of enjoyment from activities as a hedonic and not a utilitarian function of games (Ryan & Deci, 2000a). According to Landers & Callan (2011), enjoyment affects a person's motivation in the game. Furthermore, intrinsic motivation contributes to increased enjoyment in the long term (Werbach & Hunter, 2012). While playing the game, players earn points, move to higher levels, and win badges or trophies as prizes, however, this reward mechanism does not diminish the user's intrinsic motivation. Furthermore, rewards do not necessarily decrease intrinsic motivation in a context where people are opportune to fulfil their basic psychological needs.

H3: Intrinsic motivation positively affects enjoyment.

2.7. Intrinsic Motivation and Work Engagement

Motivational interactions are used to increase need satisfaction by describing the role of game elements and contextual factors in employee engagement using information systems in the workplace (Suh, 2017). This serves as a new paradigm to increase employee engagement in work-related activities, such as knowledge contribution, idea creation, training, and sales performance (Suh, 2017). Intrinsic motivation contributes to long-term engagement and enjoyment (Werbach & Hunter, 2012). Furthermore, meaningful game dynamics focuses on the game's hedonic function in overcoming one's intrinsic motivation, which leads to deep engagement and satisfaction (Deci et al., 1999).

A simpler approach to increasing motivation and engagement is by using game dynamics, with the choice of the mechanism used to motivate and encourage desired behaviors that can promote engagement and interest, as well as it can lead to more effective learning (Dicheva et al., 2014). Herbert et al. (2014) presented an approach to differentiate between learners in terms of game dynamics typology, which is potentially used to provide tailored motivational features and increase participant engagement (Herbert et al., 2014). It is carried out by tracking behavior by selecting actions and investigating the relationship between the type of Gamification and the actual behavior. Motivation models from varying student types are expected to improve content presentation design and learning feedback, thereby increasing engagement with the virtual world's learning process (Herbert et al., 2014).

Employees with intrinsic motivation have confidence in their ability to complete work, have a social bond with the company, and able to create a pleasant working atmosphere. Furthermore, employees' motivations have an impact on their morale and also creates a pleasant working atmosphere (Nguyen et al., 2020).

H4: *Intrinsic motivation positively affects work engagement.*

2.8. Enjoyment and Work Engagement

Enjoyment in using information systems leads to increased work engagement in a gamified information system (Suh, 2015). According to Xu et al. (2017), emotional enjoyment in playing games leads to more user engagement. Employees promote deep engagement by applying game elements for fun and enjoyment (Suh et al., 2017). High engagement of game players contributes to their gaming experience and emotional enjoyment of playing, leading to more engagement (Xu et al., 2017).

Gamification mechanisms such as the virtual gaming world, storyline design, and point systems integrate gamification dynamics, which are used to motivate the promotion of participant engagement (Kuo et al., 2017). This is because games are an exterior expression and involve a series of rules, activities, and different types of games to achieve the ultimate goal of enjoyment. The trend associated with using the game dynamics mechanism in a non-game context increases audience motivation and user engagement. It also requires considerable effort to integrate more fun components with non-gaming targets instead of simply designing games purely for entertainment or commercial purposes (Kuo et al., 2017).

Enjoyment in this context refers to the extent to which individuals have pleasant experiences when engaging with the use of information systems (Qiu & Benbasat, 2010; Suh et al., 2018). A theoretical model that predicts user engagement with IS is measured by drawing Cognitive Evaluation Theory (CET). According to CET, people have psychological needs, such as autonomy, competence, and connectedness, when engaged in certain activities. With this condition, individuals feel that if their psychological needs are fulfilled and if they are intrinsically motivated for greater enjoyment, then they will be motivated to put their best. Since game elements affect the satisfaction of the user's psychological needs, it increases enjoyment, to create engagement (Suh et al., 2018).

H5: *Enjoyment positively affects work engagement.*

3. Methodology

Data was obtained from 226 employees of a startup Limited Liability Company legal entity through questionnaires. This company was used because it guaranteed the legal

entity's generation, ensures employee engagement, contains greater benefits, increased work targets and career paths to increase motivation. The assessment of this questionnaire uses a Likert scale with 5 alternative choices, namely 1 (Strongly Disagree), 2 (Disagree), 3 (Disagree), 4 (Agree) and 5 (Strongly Agree). The dimension used in measuring the constructs of indicators or dimensions determination for each variable in this section is an attempt to form indicators from previously described variables. This process is carried out to assist measurement techniques and provide ease of observation in data collection. The explanations for the variables are shown in Table 1.

Data analysis used the AMOS Structural Equation Modeling (SEM) model. Analysis of the relationship path between variables obtained four (4) equations as follows:

$$Y_{IM} = \gamma_{11}X_{GD} + \varepsilon_1 \quad (1)$$

$$Y_{ENJ} = \gamma_{21}X_{GD} + \beta_{21}Y_{IM} + \varepsilon_2 \quad (2)$$

$$Y_{WE} = \beta_{31}Y_{IM} + \beta_{32}Y_{ENJ} + \varepsilon_3 \quad (3)$$

$$Y_{WE} = \gamma_{31}X_{GD} + \beta_{31}Y_{IM} + \beta_{32}Y_{ENJ} + \varepsilon_3 \quad (4)$$

4. Results and Discussion

4.1. Initial Model

The Structural Equation Model (SEM) results on the structural equation are shown in Figure 1.

Figure 1 shows the chi-square value of 1645,289 with a probability above the significance limit of 0.000 or (<0.05). This means that the null hypothesis stated that there is no difference between the sample covariance matrixes with the estimated population covariance, matrix unacceptable or rejected. The GFI value is 0.693 (<0.90), and the RMSEA is 0.087 (>0.080). The chi-square probability value is below 0.05, therefore it is concluded that the endogenous construct model unfulfilled the goodness of fit requirements. This is caused because there is a high correlation between the independent variables not described in the model.

4.2. Improvement Model

4.2.1. Goodness of Fit Testing

The structural equation model (SEM) results in the improvement model are shown in Figure 2.

Meanwhile, the fit test analysis results on the theoretical model are determined using the empirical model, and Chi-Square value (χ^2), at a significance level of 5% or 0.05. Based on the improvement test, the results show the value of goodness of fit, such as Chi-Square (152.014), Probability (0.150), CMIN / DF (1.126), GFI (0.931), AGFI (0.903), TLI

Table 1: Variable, Description, Indicator, and Measurement Scale

No	Variable and References	Description	Indicator/Sources	Measurement Scales	
1	Game Dynamics (X_{GD})	Game dynamics is defined as a method to make the work enjoyable (Schonfeld, 2010; Suh et al., 2015; Bunchball, 2014; Neeli, 2012)	This variable uses PLB, which refers to the Point, Level, and Badges, to produce different dynamics, such as reward, status, and achievement (Suh et al., 2015).	Scale 1 low gamification dynamic	Scale 5 High gamification dynamic
2	Work Engagement (Y_{WE})	Work engagement is defined as a psychological investment and effort that leads to the characteristic of learning, understanding, mastering the knowledge, skills, or craft to be shown (Newmann et al., 1992).	Engagement is positive, satisfying, and work-related as a state of mind characterized by vigor, dedication, and absorption (Schaufeli et al., 2002).	Scale 1 low work engagement	Scale 5 High work engagement
3	Intrinsic Motivation (Y_{IM})	Intrinsic motivation is defined as an interest in actual activities and has no external reward except enjoyment (Ryan & Deci, 2000c)	Intrinsic motivation refers to an activity associated with interest, or enjoyment, and satisfaction, which comes from experience in explaining human behavior (Lin, 2007). This research uses intrinsic motivation, with 3 measurements namely Self-efficacy, Social Bonds, and Playfulness (Feng et al., 2018).	Scale 1 Low intrinsic motivation	Scale 5 High intrinsic motivation
4	Enjoyment (Y_{ENJ})	Enjoyment is defined as the extent an activity is carried out to provide pleasure and enjoyment in its rights, apart from the performance consequences (Venkatesh, 2000).	Perceived usefulness attracts attention to benefits beyond the user's system interactions in improving job performance. Hence, perceived enjoyment determines the extent to which pleasure is derived from using the system. Therefore, it focuses on intrinsic motivation (Heijden, 2004).	Scale 1 Low enjoyment	Scale 5 High Enjoyment

(0.993), CFI (0.0995) and RMSEA (0.025). Therefore, it can be concluded that the whole test showed a fit result.

4.2.2. Analysis of Direct Effects in Research Models

Table 2 shows that the direct effect coefficient of the model built after carrying out a detailed analysis.

4.3. Hypothesis Test

The hypothesis testing proposed in this research is carried out by analyzing the Probability Value (*p*-value) and the significance level (sig) obtained from the Critical Ratio (CR). This process is carried out using a significance level

(*p*-value) with a standard test of 5% or 0.05. Overall, these results are tabulated in the summary table of the hypothesis testing results of Table 3.

Table 3 shows that the intrinsic motivation variable's coefficient value has the highest total effect towards enjoyment.

4.4. Discussion

The Effect of Game dynamics Towards Intrinsic Motivation

Based on the analysis, the significance level value (*p*-value) of the test results was obtained at 0.000. This means that Game dynamics positively increases employee

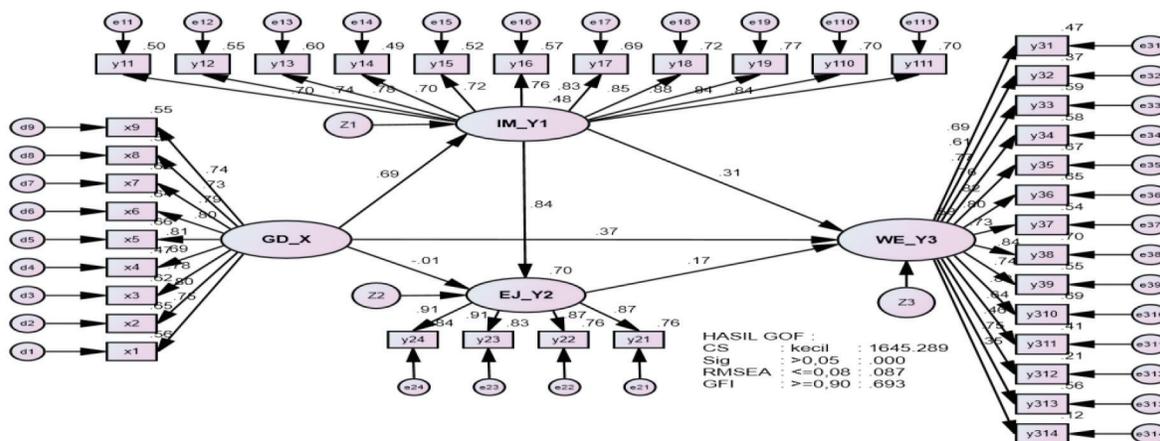


Figure 1: Initial Model

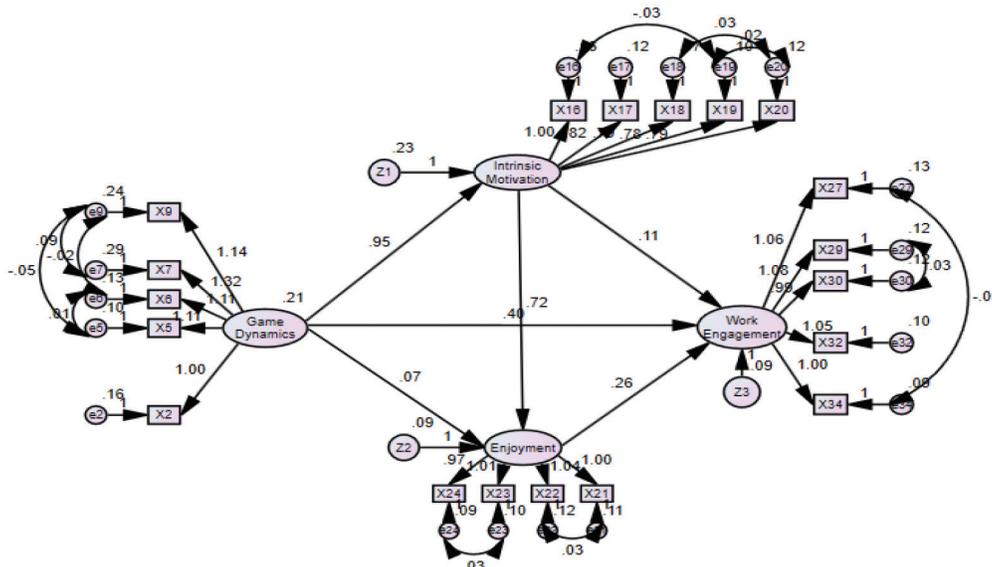


Figure 2: The Results of Structural Equation Model Testing on the Improvement Model

Table 2: Regression Results

		Standardized Direct Effect	C.R.	p-value
1st Equation: $Y_{IM} = \gamma_{11}X_{GD} + \epsilon_1$				
Intrinsic motivation	Game dynamics	0.669	8.682	0.000*
2nd Equation: $Y_{ENJ} = \gamma_{21}X_{GD} + \beta_{21}Y_{IM} + \epsilon_2$				
Enjoyment	Game dynamics	0.055	0.802	0.422
Enjoyment	Intrinsic motivation	0.811	9.836	0.000*
3rd Equation: $Y_{WE} = \gamma_{31}Y_{IM} + \beta_{32}Y_{ENJ} + \epsilon_3$				
Work engagement	Intrinsic motivation	0.152	1.192	0.233
Work engagement	Enjoyment	0.315	2.658	0.008*

*Significant at the 5% level.

Table 3: Summary of Hypothesis Testing Results

Hypothesis	β	SE	p	Test Result
Game dynamics positively affect intrinsic motivation	0.669	0.110	0.000*	H1 Accepted
Game dynamics positively affects enjoyment	0.055	0.087	0.422	H2 Rejected
Intrinsic motivation positively affects enjoyment	0.811	0.073	0.000*	H3 Accepted
Intrinsic motivation positively affects work engagement.	0.152	0.092	0.233	H4 Rejected
Enjoyment positively affects work engagement	0.315	0.097	0.008*	H5 Accepted

*Significant at the 5% level.

intrinsic motivation. The use of points, levels, and the leader board enable employees to choose their activities and interact with other gamified system participants. These elements are expected to understand progress and foster a sense of competition (Suh et al., 2015). Furthermore, it has been applied to a broad spectrum of non-gaming contexts with varying degrees of success (Hamari & Sarsa, 2014; Seaborn & Fels, 2015).

The effect of individual game elements on intrinsic motivation significantly contributes to game dynamics, such as how game elements are in certain contexts with the potential to help designers relate to the implementation context during development (Seaborn & Fels, 2015). According to Mekler et al. (2015) points, levels and leaderboards serve as extrinsic incentives that are only effective for promoting quantity performance. On the other hand, it has been suggested that providing a non-controlling and well thought out application for game elements actually increase intrinsic motivation by satisfying the user’s innate psychological need for autonomy, competence and connectedness (Deterding, 2015; Mekler et al., 2015).

The Effect of Game dynamics Towards enjoyment

The significance level value (p -value) of the test results was obtained at 0.422. This means that the Game dynamics variable does not affect enjoyment, thereby contradicting the preliminary studies. Various mechanism elements are built to allow for greater enjoyment and playfulness in activities (Reiners & Wood, 2015; Mulcahy et al., 2018). Enjoyment is also important to ensure users to continue to use gamified applications, thereby increasing their knowledge. Enjoyment refers to the emotional playfulness of users interacting with gamified applications as measured through perceived enjoyment or pleasure, which tends to affect intention (Mulcahy et al., 2018).

The use of game elements, such as points, levels, and the leaderboard is essential to increase enjoyment in completing work (Luis et al., 2008). The fact that people enjoy the game makes them want to continue playing it, and in turn, creates a more useful output. Furthermore, it is important to note that additional game mechanics enhance player enjoyment (Shao, et al, 2017). According to Jia et al. (2016), people’s

personality traits are related to their perceived preferences from various motivational opportunities widely used in the gamification system. The findings suggest that personality traits play a role in people’s perceived preferences on game dynamics and highlight opportunities to engage users. There are two main personality traits that serve to differentiate application users, namely extraversion and emotional stability (Jia et al., 2016). This is in line with the research carried out by Deterding et al. (2011), which stated that efforts to encourage user interaction in gamification dynamics by applying game elements to non-game systems aim to increase engagement, loyalty, and enjoyment.

The Effect of Intrinsic Motivation Towards Enjoyment

The significance level value (p -value) of the test results was obtained at 0.000. This result is interpreted as an intrinsic motivation that positively affects the employee enjoyment variable. The desire to engage in certain behaviors arise from promised external rewards or punishments (Yang et al, 2015). The game dynamics concept promotes human motivation, both extrinsically by providing meaningful reasons, such as loyalty programs associated with enjoyment and pleasure (Lütteken et al., 2016).

Intrinsic motivation refers to motivation which comes from inside a person, such as enjoyment rather than from any external reward (Ryan & Deci, 2000; Suh, 2015). It identifies the factors that make people intrinsically motivated according to their basic psychological needs, such as autonomy, competence, and connectedness. According to Landers & Callan (2011), enjoyment affects a person’s motivation in the game. The application of game dynamics adds behavior value through increased enjoyment experienced, thereby increasing intrinsic motivation (Jung et al., 2010). Furthermore, Werbach & Hunter (2012) stated that intrinsic motivation contributes to increased enjoyment in the long term.

The Effect of Intrinsic Motivation towards Work Engagement

Based on the analysis, the significance level value (p -value) of the test results was obtained at 0.233. This means that the intrinsic motivation variable has no effect on work engagement. Therefore, motivational interactions need to be

used to increase need satisfaction by describing the role of game elements and contextual factors in employee engagement using information systems in the workplace (Suh, 2017). This serves as a new paradigm for increasing employee engagement in work-related activities, such as knowledge contribution, idea creation, training, and sales performance (Suh, 2017).

A simpler approach to increase motivation and engagement is to use game dynamics, with its mechanics used to motivate and encourage the desired behavior capable of promoting employee interest, thereby leading to more effective learning (Dicheva et al., 2014). Herbert et al. (2014) presented an approach to differentiate between learners in terms of game dynamics typology, which can potentially be used to provide customized motivational features to increase participant engagement. It is carried out by tracking through action selection and investigating the relationship between gamification type and actual behavior. Furthermore, motivation models from various types of students are expected to improve content presentation design and learning feedback, thereby increasing engagement with the virtual world's learning process (Herbert et al., 2014).

The Effect of Enjoyment towards Work Engagement

According to research analysis, the test results' significance level value (p -value) was obtained at 0.008. This means that enjoyment positively affects the employee work engagement variable. Enjoyment in using information systems lead to increased work engagement in a gamification information system (Suh, 2015). Emotional enjoyment associated with playing lead to more user engagement (Xu et al., 2017). Additionally, the game elements help in deep engagement as it adds to fun and enjoyment and therefore increases game activity (Suh et al., 2017).

Enjoyment in this context refers to the extent to which individuals have pleasant experiences when engaging with information systems (Qiu & Benbasat, 2010; Suh et al., 2018). A theoretical model is used to predict user engagement with IS by drawing on Cognitive Evaluation Theory (CET). According to CET, people have psychological needs, such as autonomy, competence, and connectedness, when engaged in certain activities. Furthermore, individuals feel their needs to be fulfilled and intrinsically motivated for greater enjoyment, which in turn leads to higher engagement in activities. This is because the game elements affect the satisfaction level of the user's psychological needs, thereby increasing enjoyment, and engagement (Suh et al., 2018).

5. Conclusion and Limitations

The theoretical implications of this research are as follows:

1. This research indicates that the theory regarding Self-Determination Theory (SDT) has been

confirmed, with the facts that when employees are inherently motivated at work, they perform their duties effectively and efficiently. Currently, a few studies have utilized Self-Determination Theory to verify and confirm its antecedents and consequences. This research has theoretical implications, namely filling research gaps with regard to antecedents and consequences of Self-Determination Theory. Furthermore, this research theoretically verifies and confirms the antecedents. Game dynamics has the potential to increase motivation by providing employees with experiences that satisfy universal psychological needs in examining their effects on performance and satisfaction needs. However, the problem associated with Game dynamics is motivational design. This is because it is evident that understanding game design features that show successful user engagement over a long period of motivates users.

2. This research has theoretical implications for the company's gamified part designed to facilitate employee work-related activities, such as knowledge sharing, idea generation, and performance. Furthermore, by considering the trait of a gamified company information system in providing technological functions for self-tracking and self-monitoring, users engage in work-related activities, using information systems that lead to increased work engagement.

This research's managerial implication is employee engagement, which is intrinsically motivated by the game dynamics application by drawing a framework of Self-Determination Theory (SDT). The effect of individual game elements on intrinsic motivation significantly contributes to the Gamification of game elements in certain contexts and has the potential to assist designers in game development in the implementation context. The next managerial implication in this research acts as an effort to encourage user interaction in its dynamics by applying game elements to non-game systems to increase user engagement, loyalty, and enjoyment. The last managerial implication is to increase motivation in order to enable employees to obtain a sense of enjoyment from the use of technology, and it causes users to become psychologically absorbed during its usage. Intrinsic motivation contributes to long-term engagement and enjoyment.

1. The unit of analysis (respondents) in this research is associated with middle-to-lower management employees because they are the ones directly attached to analyzed variable. Therefore, they were asked to give their perceptions through a questionnaire

previously prepared by the author. This condition causes employees' perceptions to be unknown regarding good expectations before and after this research was conducted.

2. The concept of employee engagement in this research is only seen as an individual desire, not a group behavior, because it is obtained from a small group with leaders ensuring togetherness and solidarity.

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