Macro Ergonomic Modeling in Instagram Usage Based on The Socio-Technical System Approach

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Abstract

The internet is one of the things that is needed today, especially in social media. Social media is in great demand for exchanging information and discussions. Many millennials are addicted to social media, one of which is Instagram. They experience high sleep disorders, extraversion, and neuroticism. The internet and social media are often used by people in everyday life in fast-changing societies. Technological, psychosocial, and cultural variables (socio-technical system) which influence each other significantly affect individual productivity. This study uses the TAM approach to ensure that individuals are fit in using Instagram technology, optimizing the use of Instagram and its influence on these individuals to be more productive and doing activities to optimize their self-esteem and life satisfaction. The formulation of problems discussed in this study is to formulate a macro ergonomic model composed of technological and psychosocial variables in Indonesia with the TAM approach. This study analyzes aspects of macro ergonomics, modeling Instagram intrusion, internet addiction, self-esteem, life satisfaction and technology aspects with TAM approach to optimize individual self-esteem and life satisfaction and formulate recommendations for prevention addiction to Instagram in Indonesia. This study uses a method of integrating macro ergonomic aspects (socio-technical system), the TAM approach, questionnaires, and Structural Equation Modeling testing. The result of this research is there is a relationship between technological and psychosocial aspect as macro ergonomic aspects. Perceived ease of use variable has positive relationship with perceived usefulness, the perceived ease of use variables has a positive effect on the Instagram Intrusion variable. Perceived usefulness, life satisfaction, and behavioral intention to use variables have a positive influence on the internet addiction variable, the self-esteem variable has a significant influence on the life satisfaction. Moreover, the self-esteem and attitude variables have a positive influence on the behavioral intention to use variable. Recommendations for preventing Instagram intrusion in Indonesia include optimizing Instagram to make productive and beneficial things and not frustration/depression. Besides, everyone must think everyone has a good quality of life, is more relaxed in using Instagram so that they are not easily frustrated; they can use Instagram regularly well and stay productive. Moreover, always think positive that everyone has valuable and capable of achieving goals to have high life satisfaction. Everyone can use technology properly for valuable things. This research can be expanded, considering that the needs of each country are different, especially since each country has a different level of culture.

Keywords
Socio-Technical System, Macro Ergonomics, Internet Addiction, Instagram Intrusion, Self Esteem, Life Satisfaction

1. Introduction
Social Networking Service (SNS) has become an important of communication used for professional, personal, recreational, and information purposes (Stephen et al. 2016). The first SNSs were launched in 1997 and currently number in the hundreds worldwide. Apart from Twitter, LinkedIn, Myspace and Facebook, Instagram is one of the popular social media (Błachnio et al. 2016). Currently, there are more than one billion Instagram accounts registered

(Globalwebindex 2020), and it is ranked 3rd among the most popular social media applications (We Are Social 2020). The Instagram application allows users to upload photos and videos into an editable feed with various filters and arranged with tags and location information. Instagram is one of the most popular social media. Although Instagram is one of the fastest-growing social media platforms, the differences in user behavior have been staggering so far. Several studies have examined motivation to use Instagram but have not examined its relationship with other factors, Facebook's social media relationship with its adverse social/negative effects, and depression (Sheldon et al. 2017). Previous research said that Facebook intrusion and motivation in using Instagram had focus on society in USA (Błachnio et al. 2019). There is lack of model in this research, the model only focus on psychosocial aspect, explain motivation of using Facebook, what's type of Facebook intrusion (Błachnio et al. 2016). Increasing of participants and increasing of time using Facebook (Ryan et al. 2014), the problem of overuse in each person having negative effects that must be investigated. The addiction of social media includes in internet addiction (Błachnio et al. 2016). Addiction to SNS can be treated as a subtype of Internet overuse (Błachnio et al. 2016). The authors mention three aspects of the "Intrusion" phenomenon, namely:

    1. Withdrawal is defined as a feeling of distress caused by the inability to access.
    2. Relapse and Reinstatement is defined as unsuccessful attempts to reduce use.
    3. Euphoria is defined as a feeling of being connected to others.

Many millennials are addicted to social media. They have experienced high levels of sleep disorders, extraversion, and neuroticism. Excessive involvement on social media, which interferes with daily activities and interpersonal relationships (feelings of pressure), does not reduce social media use, including Instagram. The existence of exciting content on Instagram is one factor for users to access social media for a long time (Sheldon et al. 2017). Based on a preliminary survey that had been conducted involving several respondents, around 30 respondents said that the habit of accessing social media for a long enough time aims to release boredom/fatigue. It makes not productive activity.

Internet Addiction (IA), also referred to as pathological Internet use/Internet overuse or loss of control over Internet use. People who frequently experience internet addiction are usually described as shy individuals (Caplan 2005, Chak and Leung 2004), lacking social skills (Caplan 2005), more introverted (Kraut et al. 2002), lonely (Caplan 2002), and have external controls (Sariyska et al. 2014). Previous research related to internet relations was carried out only on social media Facebook, which helps find out the problem of Facebook intrusion and does not originate from the availability of internet/social networking sites. However, more from the influence of demographics (for example, gender), the personal characteristics of Facebook users and in this study also still has not explained the different factors in Facebook intrusions. These findings suggest factors that may play a role in Facebook intrusion and sleep disturbances in adolescents. Depression and Facebook intrusions can lead to poor sleep quality. Previous research has not yet analyzed this related to Instagram addiction both quantitatively and qualitatively from various variables. Some things addiction affects sleep disorders, extraversion, and neuroticism. This addiction will then be investigated in the use of Instagram in Indonesia. Technology and psychosocial aspects are essential aspects of macro ergonomics and deserve research (Kleiner 2008). These technological and psychosocial aspects are aspects of macro ergonomics known as the socio-technical system (Waterson et al. 2014) in which technological and social variables (in this case, psychosocial in humans) influence each other and increase individual productivity. This psychosocial aspect consists of internet addiction, Instagram intrusion, self-esteem, and life satisfaction. These four aspects were chosen because they affect individual productivity and quality of life (Błachnio et al. 2019). However, internet addiction is also part of the technological aspect due to the use of the internet and social media via smartphones. This technology is part of the Internet of Things. This technology is one part of the Internet of Things that must be optimized to increase productivity, self-esteem, and life satisfaction. The technological aspect consists of variables in the Technology Acceptance Model (TAM), namely perceived ease of use, perceived usefulness, attitude, behavior intention to use, and usage behavior. The technological aspect is worth researching because technology is an essential part of individuals' activities, one of which is accessing social networking sites (Błachnio et al. 2016). In addition to Instagram intrusion and internet addiction factors, life satisfaction and self-esteem are also worth researching because using Instagram will affect everyone's life satisfaction and self-esteem. Based on previous research on the use of Facebook, it was found that people who have low self-esteem show a high dependence on Facebook, while people who have high Facebook intrusion have a low level of life satisfaction. Further research is needed regarding aspects of self-esteem and life satisfaction for Instagram users.

This research will use the Technology Acceptance Model (TAM) method, which is a method used to explain user acceptance behavior towards technology. The advantage of this method is that it is one of the most widely used methods for conducting user research. The purpose of this method is to explain the factors of user behavior towards

technology acceptance. The benefit of this method is to analyze and understand the factors that influence the acceptance of the use of computer technology. The TAM method can assess system user acceptance and explain the system user factors so that researchers can identify why a factor is not accepted and provide possible appropriate steps to provide a solution. The Technology Acceptance Model (TAM) has two sides; namely, the first side is called "believes," which consists of perceived usefulness and ease of use, and the second part consists of attitude, desire (behavior intention to use), and user relations (usage behavior) (Setiawan et al. 2018). This TAM (technology) aspect is related to the social (psychosocial) aspect, which is part of the socio-technical system aspect. Perceived ease of use variable has a positive influence on Instagram Intrusion variables (Agag and El-masry 2016) and life satisfaction (Jongchul and Sung-joon 2014), where Instagram is easy to use, practical. Instagram features that are clear to millennials can make Millennials access Instagram for a long time and make Instagram users feel satisfied. Perceived usefulness variables positively influence internet addiction variables where Instagram can increase productivity, knowledge, whether beneficial or reduced focus, affecting the millennial generation always to access the internet. Millennials will continue to access the internet when they feel the benefits of the internet. Some of the benefits of the internet are self-esteem and life satisfaction. The self-esteem variable has a positive influence on the behavioral intention to use a variable (Hsieh et al. 2017) and the life satisfaction variable (Błachnio et al., 2019), this is because the millennial generation who has the competence and high self-esteem will be more interested in using technology and will make himself happy/high life satisfaction. The internet addiction variable has a positive influence on the Instagram intrusion variable (Błachnio et al. 2019) because the more frequent use of the internet causes the millennial generation to use Instagram continuously. Attitude variable (positive or negative feelings from someone if they must do the behavior to be determined), in this case, Instagram, will positively influence the behavior intention to use a variable (Latifah and Afifah 2013). The relationship between the four psychosocial variables and technology variables illustrates the macro ergonomic aspects that positively impact increasing individual productivity, health and safety, and individual life satisfaction (Kleiner 2008). Besides, Technology Acceptance Model approach will ensure the individual fit to the technology and using Instagram, knowing the purpose and optimizing of Instagram using (Agag and El-masry 2016) in order to be beneficial to service provider industry and individual be productive in accessing media social and do activities correctly. The formulation of problems discussed in this study is: How is the model of macro ergonomic aspects composed of technological variables and psychosocial variables (Instagram intrusion, internet addiction, life satisfaction, self-esteem) in Indonesia with the TAM approach.

The objectives of this research:
1. Analyzing macro ergonomic aspects by considering technology and psychosocial variables using the TAM approach in Indonesia.
2. Modeling Instagram intrusion, internet addiction, self-esteem, and life satisfaction variables with the TAM approach.
3. Formulate recommendations for the prevention of Instagram addiction in Indonesia.

2. Literature Review

2.1 TAM
The Technology Acceptance Model (TAM) is a theory about the use of information technology systems considered very influential and is generally used to explain the individual acceptance of information technology systems. The first TAM was developed by Davis (1985) based on the Theory of Reasoned Action (TRA) model. The most crucial advantage of TAM is that TAM is a parsimony model, which is a valid but straightforward model. In addition, TAM has also been tested with many studies and a good model when compared to the TRA and TPB models. TAM is influenced by two constructs: perceived usefulness and perceived ease of use. The two constructs are the most striking differences that exist in TAM when compared to TRA and TPB. In addition, in TAM, there are no subjective norm constructs and perceived behavioral control. TAM has five primary constructs, namely: (1) Perceived usefulness, (2) Perceived ease of use, (3) Attitude toward using technology (attitude), (4) Behavioral intention to use (intention), and (5) Actual technology use (Davis 1985).

2.2 Macro Ergonomics
A macro ergonomics is an ergonomic approach based on an organizational design in a working system. A conceptual definition is a socio-technical approach from top to bottom applied to the overall work system design at various micro-ergonomic interactions such as human-work, human-machine, and human-software to optimize the work system design and ensure the work system. It goes harmoniously. Macro ergonomics plays a role in designing socio-technical

systems regarding "human-organization" and "technology." Macro ergonomics is often equated with organizational ergonomics and roughly justified because organizational ergonomics often speaks in the scope of systems. Trist and Bamforth (1951) first developed the socio-technical systems model from the Tavistock Institute of Human Relations, England. This model views the organization as a transformation agent that transforms inputs into outputs. The elements in the socio-technical system are: 1) Technology Subsystem Joan Woodward (1965) in Hendrick and Kleiner (2001) states that technology is a determinant of the organizational structure of work systems. Perrow in Hendrick and Kleiner (2001) defines technology as an action taken on an object to change it, where this action requires technological knowledge. 2) Personnel Subsystem Characteristics, personnel subsystem can be divided into three: level of professionalism, demographic factors, and psychosocial factors. 3) Environmental subsystem, the organization's continuity depends on adapting to the external environment. The types of external environment include socioeconomics, education, politics, and culture. Burns and Stalker's law in Hendrick and Kleiner (2001) suggests a type of work system structure for a relatively stable and straightforward organizational environment in contrast to dynamic and complex environments (Haro and Kleiner 2008).

2.3 Structural Equation Modelling (SEM)
Structural Equation Modeling (SEM) grows and has the same goals as multiple regression but more robustly, which considers the independent and dependent latent variables, and each variable is measured by multiple indicators (Garson 2015). Latent variables are variables that cannot be measured directly. A latent dependent variable is a latent variable that is influenced by other latent variables. Meanwhile, latent independent variables are latent variables that are not influenced by other latent variables. Examples of latent variables are system quality, information quality, user satisfaction, and others (Ginting 2009). Ginting also added that several indicators could only measure these variables and latent variables gave rise to a further analysis model. In latent variables, there are exogenous variables and endogenous variables. Exogenous variables are variables whose values are not influenced or determined by other variables in the model (independent).

Meanwhile, endogenous variables are variables whose value is influenced or determined by other variables in the model (dependent). SEM can be used as an alternative solution for multiple regression, path analysis, factor analysis, time series analysis, and analysis of covariance (Garson 2015). SEM also tests goodness-of-fit, which calculates several alternative goodness-of-fit coefficients and uses ratios to degrees of freedom and several fit indices, such as the comparative fit index (CFI), normed fit index (NFI), and Root Mean Square Error of Approximation (RMSEA) (Khang et al. 2014).

2.4 Internet Addiction
According to Young (1998), aspects of internet addiction include the following: attention is focused on online activities; want to play the internet in an increasing amount of time for satisfaction; unable to control, reduce or stop internet activities; feeling restless, depressed, irritable when reducing or stopping internet use; online longer than planned time; make the internet a way to get away from various problems or get away from unpleasant feelings; always go back to using the internet even though it has spent a lot; tendency to withdraw when offline; dare to take the risk of losing relationships with people closest to, work, education, or career because of playing the internet; lying against family members to reduce the level of internet play relationships. Young (1998) suggest that the negative impact of the internet makes a person lazy to communicate in the real world because it feels more pleasant to communicate with online friends, resulting in a lack of empathy for the environment or society. Sufferers try to overcome the anxiety they have by running away from the real world to the virtual world; as a result, when they must communicate with other people in the real world, the atmosphere becomes stiff so that the possibility of establishing cooperation becomes smaller (Dewi and Trikusumaadi 2017). Griffiths (2015) lists six dimensions of internet addiction, namely: Salience, Mood modification, Tolerance, Withdrawal symptoms, Conflict, Relapse.

2.5 Self Esteem
Self-esteem is a part of a person's personality which is very important in everyday life. Many theories discuss self-esteem; Frey and Carlock (1984) propose two components in self-esteem, namely self-competence, and self-esteem. It is concluded that self-esteem is a subjective assessment made by an individual due to his evaluation of himself, reflected in a positive or negative attitude, by expressing an agreement or disagreement from various sources, both internal and external (Sari Puspita 2017). According to Coopersmith (1967), Self-esteem is an evaluation made by individuals and is usually related to self-esteem; this expresses an attitude of agreeing or disagreeing and shows the degree to which the individual believes himself to be capable, substantial, successful, and valuable. In general, self-

esteem is an evaluative component of self-concept, a broader self-representation that includes cognitive and behavioral aspects that are judging and affective, Blascovich and Tomaka (Coetzee 2005).

2.6 Life Satisfaction

Diener and Scollon (Hamdana and Alhamdu 2015) explain that life satisfaction is one of the main components of individual well-being. According to Diener et al. (1985), life satisfaction refers to the process of individual cognitive assessment. It can be said that life satisfaction is one of the main components of individual well-being and is defined as an individual cognitive assessment of life satisfaction globally (Pavot and Diener, 1993). Global life satisfaction is defined as an assessment of life in general and specific parts of an individual's life, such as satisfaction within the sphere of family, friends, community, and self-satisfaction (Huebner 1991). Based on the definition of life satisfaction from some of the experts above, Ulfah and Mulyana 2014 concluded that the level of life satisfaction could be seen from the high assessment shown by individuals on the five components of life satisfaction, namely the desire to change lives, satisfaction with current life, past life satisfaction, satisfaction with future life and individual assessment of life.

3. Methods

3.1 Model Development and Hypotheses

The variables used in this study come from the integration of macro ergonomic aspects (psychosocial and technology) with the TAM approach in Indonesia. The following Figure 1 shows the hypothetical model that is researched.
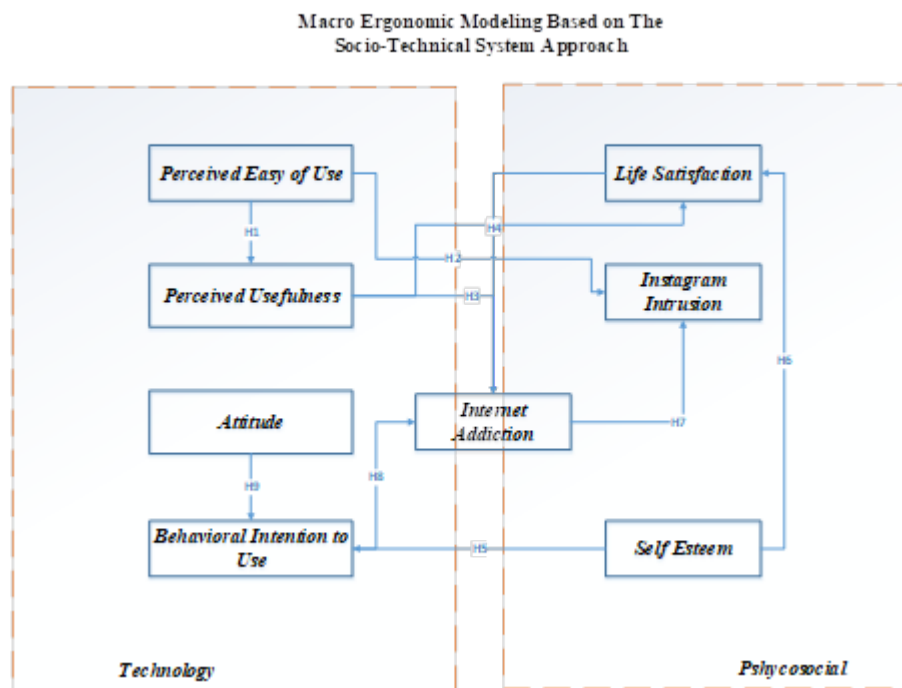

Figure 1. Hypothesis model

3.2 Preparation of Questionnaires and Determination of Assessments

This study uses a Likert scale as a measurement technique. The Likert scale is used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena. The research instrument that uses the Likert scale can be made in a checklist or multiple choices. In this study, a Likert scale was used on an even scale by eliminating middle or neutral choices (Abdul 2010), namely one (strongly disagree) to six (strongly agree) or one (never) to six (very often). It is intended that the results issued do not contain a biased meaning from the respondent.

3.3 Distribution and Determination of Respondents' Samples

This questionnaire distribution technique is carried out online and uses Google Form to distribute questionnaires online; Google Form as a medium for providing questionnaires and recapitulates answers from respondents. This questionnaire is intended for millennials who have Indonesian citizenship and are general for all circles, where they will be identified regarding gender, type of work, and level of education (Robertson and Kee 2017). Meanwhile, the determination of the number of samples is determined based on (Hair et al. 2010), which states that the number of samples that must be obtained for analysis using the Structural Equation Model (SEM) technique is 5-10 times the number of existing indicators (Putri et al. 2019). This study uses 65 indicators for all variables so that the minimum sample size that must be obtained is a minimum of 325 respondent data.

4. Data Collection

4.1 Research Respondents

The number of respondents in this study was 335 respondents with various backgrounds where 66% of women and 34% of men were divided by 85% of respondents aged 22-27 years, 9% aged 28-33 years, and 6% aged 34-40 years with conditions of followers in over 300 followers.

4.2 Initial Measurements (Measurement Model)

Several tests will be carried out at this initial measurement stage on the variables and indicators used in each variable in this study. Where this initial measurement uses AMOS software using the Confirmatory Factor Analysis (CFA) method for measuring how well the indicators are used in each latent variable, to evaluate whether each latent variable (construct) or in other languages able to represent/explain each construct (Tung et al. 2008; Shyu and Huang 2011; Wang and Chen 2012). Measurement indicators are said to be good when the estimate (factor loading) value is>= 0.5 so that values below 0.5 are invalid and must be eliminated so that the result is that there are 54 valid variable indicators out of 8 latent variables out of a total of 65 variable indicators.

4.3 Variable Reliability Test

The reliability test aims to test the research latent variable measurement model and show that the indicators have good consistency in measuring the latent variables. The reliability measurement uses the Construct Reliability (CR) and Variances Extracted (VE) criteria. However, this VE value is optional or not required (Hair et al. 1998). The CR (Construct Reliability) value shows the consistency of measurement. After checking 54 valid indicators, all of them are reliable.

4.4 SEM Assumption Testing

4.4.1 Normality Test

The data normality test was performed using the critical ratio skewness value criteria of ± 2.58 at 10% significance. The data is usually distributed if the critical ratio of skewness kurtosis value is below the absolute price of 2.58 can be rounded to 3. In general, the value of c.r. Skew and c.r. Kurtosis is in the range of -3 to 3; if the data is not standard, it can be continued with the bootstrapping method.

4.4.2 Outlier Test

Outliers are observations that appear with extreme values, both univariate and multivariate, namely those that arise because of the combination of their unique characteristics and look very much different from other observations-looking at the output data in this study through the Mahalanobis d-squared output. According to Ghozali (2014), to see outliers is to compare the value of Mahalanobis distance with Chi-square table at a significance of 0.001, Mahalanobis d-squared value, which is more excellent Chi-square table is declared outlier data. The df value in this study was 54; the results of the chi-square table were: 91.872. Then the Mahalanobis d-squared value, which is greater than the Chi-square table, which exceeds 91.872, must be removed from the data; namely, 24 outlier data must be removed.

4.4.3 Multicollinearity Test

Multicollinearity test can also be seen from the correlation value between independent variables. The multicollinearity test is a test to determine whether there is a correlation between independent variables. If the correlation coefficient

between the independent variables is >0.9, the model in this study does not meet the multicollinearity assumption (Ferdinand 2006). In addition, according to Ramdhani (2009), multicollinearity exists if there is a correlation value between indicators whose value is ≥ 0.9. Based on the data of this study, some meet the multicollinearity assumption, and some do not meet the multicollinearity assumption because of the correlation between indicators whose value is >0.9.

5. Results and Discussion

5.1 Numerical Results
The structural model describes the relationship between latent variables or between exogenous, endogenous, and other variables. In the structural testing of this model, cut-off value criteria are used to show that the model is fit, namely by assessing the Goodness of fit divided into three parts consisting of absolute fit indices, incremental fit indices, and parsimony fit indices. The purpose of testing the fit model or Goodness of fit is to determine whether the model formed is fit or not, namely whether the manifest variables (indicator variables) can explain the existing latent variables. Fit means that the empirical data fits into the model (there is no difference between the model and the data so that the model can be said to be fit). Based on the results of running AMOS, there are 8 goodness of fit criteria, namely GFI (0.78), AGFI (0.75), RMSEA (0.05), CMIN/DF (1.87), CFI (0.903), IFI (0.905), PNFI (0.73), PGFI (0.67). Because it has a good level of Goodness of fit, then the hypothesis test is checked using bootstrap, namely: This hypothesis test is said to be significant when <0.1 (Fisher RA. Statistical method for research workers. London: Oliver and Boyd; 1950. p. 80).

5.1.1 Standardized Direct Effect
The measurement results show that the variable with the most significant direct influence on the Life Satisfaction variable is the self-esteem variable (0.443). The variable with the most significant influence on behavioral intention is the attitude variable (0.832). The variable that has the most significant direct influence on the variable perceived usefulness is perceived ease of use (0.906). The variable that has the most significant direct influence on the internet addiction variable is behavioral intention (0.413). The variable with the most significant direct influence on the Instagram intrusion variable is internet addiction (0.850).

5.1.2 Standardized Indirect Effect
The variable that has the most significant indirect effect on the life satisfaction variable is not seen. The variable with the most significant indirect effect on the behavioral intention to use variable appears to be absent. There is no perceived usefulness variable. The variable with the most significant indirect influence on the internet addiction variable is the attitude variable (0.344). The variable with the most significant indirect effect on the Instagram intrusion variable is the behavioral intention to use (0.351). Because there are direct and indirect effects between variables in this research model, it is necessary to measure the total effect.

5.1.3 Standardized Total Effect
Based on the measurement results, it is known that the variable that has the most significant total influence on the life satisfaction variable is self-esteem (0.443). The variable with the most significant total influence on the behavioral intention to use variable is the attitude variable (0.832). The most significant variable for perceived usefulness is perceived ease of use (0.906). The variable with the most significant total effect on internet addiction is behavioral intention (0.413). The variable with the most significant total effect on Instagram Intrusion is internet addiction (0.850).

5.2 Graphical Results

As shown in Figure 2, this research has eight latent variables with 54 valid variable indicators. The variables are perceived ease of use, perceived usefulness, attitude, behavior intention to use, self-esteem, Instagram intrusion, internet addiction and life satisfaction. The indicators are provided from questionnaire statement according to valid references or previous research from each variable. The results show that the value of all hypotheses is accepted and significant, namely: The variable perceived ease of use has an effect positively (+) on the variable perceived usefulness (p = 0.007), the variable perceived ease of use has an effect positively (+) on the Instagram Intrusion variable (p = 0.002), Perceived usefulness variable has an influence positively (+) on the Internet Addiction variable (p = 0.066),

the life satisfaction variable has an effect positively (+) on the internet addiction variable (p = 0.004), the self-esteem variable has an effect positively (+) on the behavioral intention to use variable (p = 0.069), self-esteem variable has positively (+) influence on life satisfaction variable (p = 0.001), internet addiction variable has positively (+) influence on Instagram intrusion variable (p = 0.003), Behavioral intention to use variable has an influence positively (+) on the internet addiction variable (p = 0.004), the attitude variable has an effect positively (+) on the behavioral intention to use variable (p = 0.002). The results shown Hypotheses H1 perceived ease of use has positive relationship with perceived usefulness. This is supported by most respondents stating that Instagram is practical to use, can easily operate Instagram, Instagram features are clear and easy to understand, easy to find information on Instagram and overall, respondents find Instagram easy to use. This makes the level of usability of Instagram also increase. Recommendations for increasing perceived ease of use are to use Instagram for productive and useful things so that the mind is calmer and able to work/activity more productively so that do not experience frustration/depression and really feel the benefits of Instagram.
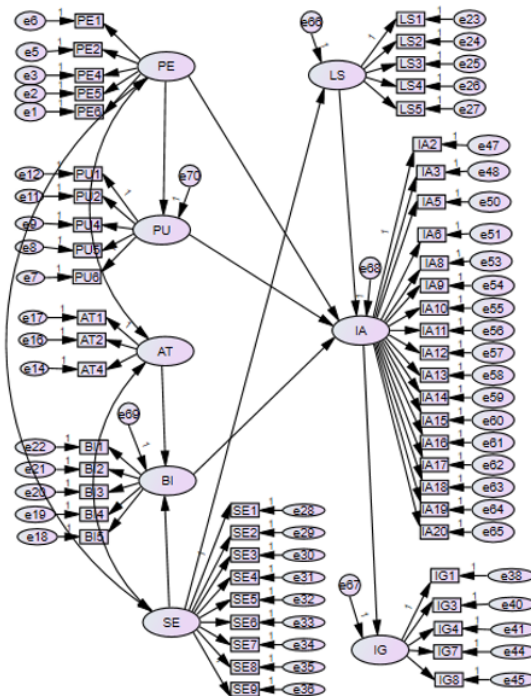

Figure 2. Structural model

There are several studies that can be used as a reference, namely the research conducted by Sariyska, et al which focused on the relationship between the influence of the internet on personality, internet addiction, and self-esteem behavior. Research from (Stephen et al., 2016) on social influence on the Twitter Mobile Device also focuses on the relationship between Twitter and behavioral aspects. Research from (Błachnio et al. 2016) examined the intrusion on Facebook on everyone's personality. There is a study related to the comparison of national cultures in the use of Instagram conducted by (Sheldon et al. 2017) which compares the United States and Croatia. With these various research references, there are still research gaps or research that does not exist in Indonesia in the aspect of macro ergonomics with the TAM approach. In this research, focus on not only psychosocial aspects but also technological aspect (macroergonomic aspects).

Based on the results of the hypothesis H2 and H7, it shows that the perceived ease of use and Internet addiction variables have a positive (+) effect on the Instagram Intrusion variable, where the internet addiction variable has the most significant positive effect. This is supported by respondents' statements stating that respondents are often online longer than planned, often prefer to play/access the internet than spend time with friends, often check email before doing anything else, often try to reduce time online but fail. Meanwhile, the perceived ease of use variable also has a significant effect because respondents stated that Instagram is practical to use, can easily operate Instagram, Instagram features are clear and easy to understand, easy to find information on Instagram and overall, I find Instagram easy to

use. Recommendations for increasing perceived ease of use and Internet addiction are to use Instagram and the internet for productive and useful things so that the mind is calmer and able to work/activity more productively so as not to experience frustration/depression.

In Instagram intrusion and internet addiction factors, life satisfaction and self-esteem are also worth investigating because the effect of using Instagram will influence everyone's life satisfaction and self-esteem. This is based on previous research on the use of Facebook, it was found that people who have low self-esteem show high Facebook dependence, while people who have high Facebook intrusion have low levels of life satisfaction. However, these two things are still uncertain because there are several previous studies which state that there is no relationship between Facebook intrusion with self-esteem and life satisfaction (Błachnio et al., 2019). In this research, there is relationship between Instagram intrusion with self-esteem and life satisfaction. In addition, the use of social media is also very influential on worker productivity, as many as more than 77% of workers use social media at work (Pew Research Center) and there is an effect in its use even according to Harvard Business Review research the use of social media can increase worker productivity and motivation (Chu 2020), but in several other studies it is the opposite, reducing productivity and hindering work (Hanna et al., 2017), so further research is needed regarding the use of Instagram that affects worker productivity. By optimizing individual productivity, the right use of Instagram can become a consideration and be useful for the service provider industry to design notifications for healthy internet usage so that it is not excessive in the use of social media and there are good promos for optimizing usage such as: creating service provider promos so that not only provide free quota continuously because it will influence excessive use of social media.

Hypotheses H3, H4 and H8 show that perceived usefulness, life satisfaction, and behavioral intention to use variables have a (+) influence on the internet addiction variable, where behavioral intention to use and life satisfaction variables have the most significant positive influence. This is supported by respondents who are interested in using Instagram regularly, suggesting others to use Instagram, respondents who are willing to continue using Instagram. In addition, the majority of respondent access Instagram every day for more than 4 hours and even state that they will access Instagram for the next 3 months. The life satisfaction variable that has a significant effect is also supported by respondents who have a high level of life satisfaction, namely the respondent stated that in many ways, his life is close to ideals, has very good living conditions, is satisfied with life, gets important things he wants. in life and will hardly change anything for having lived a good life. While the perceived usefulness variable is supported by most respondents stating that using Instagram increases knowledge, using Instagram can increase productivity, using Instagram is useful, Instagram makes it easier for him to ask for advice about an information to experts or other users and Instagram makes it easy to find information quickly. The benefits of Instagram are certainly able to increase the life satisfaction of everyone. Recommendations for increasing perceived usefulness, life satisfaction, and behavioral intention to use are to always think positively that everyone can live a good life and have a good quality of life, be more relaxed/relaxed in using Instagram so that they are not easily frustrated so they can use Instagram effectively.

Hypothesis H6 shows that the self-esteem variable has a significant influence on the life satisfaction variable where this variable has a high level of significance in influencing the life satisfaction variable. This is supported by respondents who have high self-esteem will have high life satisfaction, this is certainly in line with life satisfaction standards where someone who has high self-esteem will certainly have high life satisfaction and vice versa (Diener, 2009). Most respondents stated that they feel that they are valuable people, have good qualities, tend to be successful, can do things as well as others, have a lot to be proud of, have a positive attitude towards themselves, are overall satisfied with themselves, can respect themselves more and find it useful. The recommendation for increasing self-esteem is to always think positively that everyone has good abilities, is valuable and can achieve goals so that someone will have high life satisfaction, even in this study it is seen the importance of increasing self-esteem to increase life satisfaction.

Hypotheses H5 and H9 show that the self-esteem and attitude variables have a positive (+) influence on the behavioral intention to use variable, where the attitude variable has the most significant positive effect. This is supported by respondents who like using Instagram, stating that using Instagram is a good idea and friends and family suggest using Instagram. While the self-esteem variable is supported by most respondents feeling a valuable person, has good qualities, tends to be successful, can do things as well as others, has a lot to be proud of, has a positive attitude towards oneself, is overall satisfied with himself, can respect themselves more and feel useful so that most respondents who have high self-esteem will be high in the intensity of using technology. Recommendations for increasing self-esteem and attitude are to always think positively that everyone has good abilities, is valuable and can use technology well

for useful things.

5.3 Proposed Improvements

The proposed improvements of this research are the scope of the country, and research variables can be expanded, considering that the needs of each country are different, especially since each country has a different level of culture. It is very worthy of research. It can be extended to many countries with western culture, eastern culture, and even mixed culture (western culture tends to the east or eastern culture that tends to the west). Furthermore, research is sharpened concerning productivity in the industrial world/work area to sharpen the macro ergonomic aspects of the industrial/agency/work area. Moreover, research respondents were tried to be directed across generations to determine to what extent the acceptance of technology can help daily, technological aspects of the relationship, psychosocial aspects of macro ergonomics.

5.4 Validation

It was conducting a Focus Group Discussion (FGD) process to sharpen the respondents' hypotheses' results. In addition, FGDs also helped capture data that had not previously been recorded in online surveys. The FGD was conducted with ten respondents from Indonesia. These ten respondents were collected because they filled out an online research survey and considered another respondents' representative. In addition, the results of this FGD were also analyzed from additional data from questionnaires filled out by respondents in Indonesia.

6. Conclusion

This study concludes that macro ergonomic aspects include technological aspects (perceived ease of use, perceived usefulness, attitude, and behavioral intention to use), as well as psychosocial aspects, which include aspects of Instagram intrusion, self-esteem, life satisfaction, and internet addiction which are also technological aspects because related to excessive use of the internet via a smartphone. The modeling of Instagram intrusion, internet addiction, self-esteem, and life satisfaction with the TAM approach has been carried out by connecting Instagram intrusion, internet addiction, self-esteem, and life satisfaction variables with perceived ease of use, perceived usefulness, attitude, and behavioral intention to use variables found a relationship between technological and psychosocial aspects. Furthermore, Recommendations for preventing Instagram addiction in Indonesia include optimizing Instagram to make productive and beneficial things and not frustration/depression. Besides, everyone can live a good life and has a good quality of life, is more relaxed/relaxed in using Instagram so that they are not easily frustrated so they can use Instagram regularly well and stay productive. Moreover, always think positive that everyone has good, valuable, and capable of achieving goals to have high life satisfaction. Besides, think positive that everyone has good, valuable abilities and can use technology properly for valuable things.

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