Factors Determining the Behavioral Intention to use ConSite Application for Heavy Machine Management System: Using TAM 2 Model

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Abstract

The research focused on the internet of things in heavy machine management with ConSite application usage. The main objective of this research is to examine the five variables (experience; subjective norms; self-efficacy; perceived usefulness, and perceived ease of use) affecting the intention to use the ConSite application at PT. HEXA in Indonesia. The research used a survey method by distributing an online questionnaire to 115 employees who are working in PT. HEXA, as the ConSite application users. For testing the hypotheses, the research adopted the Structural Equation Modeling method using SmartPLS software. Results have indicated that experience and self-efficacy have a positive and significant effect on both perceived usefulness and perceived ease of use, while subjective norms do not affect both perceived usefulness and perceived ease of use. Perceived usefulness and perceived ease of use have a positive significant direct effect on the intention to use the application of ConSite in PT HEXA. Furthermore, the results study implication and findings are discussed.

Keywords
ConSite Application, Perceived Usefulness, Perceived Ease of Use, Technology Acceptance Model 2

1. Introduction
At the end of the 18th century when the first industrial revolution took place the labor and replaced by machines. The machines were operated by steam power. The second industrial revolution started around the 19th century when electrification and motorization replaced steam machines. An important invention of that time was the electric bulb invented by Thomas Alva Edison. The third industrial revolution started in the late 1960s with the appearance of computing technology which empower the automation of various human activities.

Nowadays the market condition is very competitive, with the rapid change, and the business survival depends on the adaptability and capabilities of the companies to be innovative and perform with continuous improvement. The emergence of industry 4.0 has been accelerating to digitize and transforming the manufacturing of heavy machines management systems, not only for the production but also for the whole value chain (Merkel et al. 2017). Furthermore, industry 4.0 helps to increase and identify new business models and to satisfy the demand with products and services customization through intelligent operations and management (Gökalp et al. 2017; Mourtzis and Vlachou 2018). In conclusion, traditional manufacturing transformed into the digital ecosystem.

The digital ecosystem implementation in the heavy machine system can achieve speedy and efficient maintenance service and also cost-effective production services including the services and after-sales (Rødseth, H., et.al. 2017; Silvestri et al. 2020). Most companies considered maintenance management systems as the initial steps to digitizing as it is important to have periodic maintenance (Mosyurchak et al. 2017). Due to the rapid increase of the mobile phone, the machine management system developed into a mobile application for a better report and is easily prepared

as well as easy to be shared by the dealer and the employees. This study is focused on the Consite Shot Apps behavioral intention amongst the employees at PT HEXA Indonesia, the sole and trusted distributors of HITACHI equipment and components in Indonesia. The company seeks to reduce delays in the flow of information and communication with the aim of fast response through the Consite Shot Application.

According to the Google playstore's review of this application, there were several reviews related to the performance of the app as login difficulties and slow performance. Therefore, these will matter to the users of Consite Shot Apps, since this ais pp relatively new since officially launched in early 2018. According to scholars, intention can be interpreted a as consumer's desire or intention to use products and services. The study about intention to use, learn and adapt are needed for users and this study is one of the investigations to consider to use Consite Shot Apps within the employees and the users of heavy machines. This study extend the research by Abdullah et al. (2016), but the locus of study is different. The external factors used as the exogenous variables are the experiences factors, subjective norms, and self-efficacy as factors determinants to the intention to use mediated by perceived usefulness and perceived ease of use. The research questions of this study as below:

1. What is the effect of experience on perceived usefulness and perceived ease of use the Consite Shot Apps?
2. What is the effect of subjective norms on perceived usefulness and perceived ease of use of the Consite Shot Apps?
3. What is the effect of self-efficacy on perceived usefulness and perceived ease of use of the Consite Shot Apps?
4. What is the effect of perceived usefulness and perceived ease of use on intention to use the Consite Shot Apps?
5. What is the most dominant factor to effect on intention to use the Consite Shot Apps?

2. Literature Review

2.1. Technology Acceptance Model

Technology Acceptance Model abbreviated as TAM is one of the theories related to Theory Reasoned Action (TRA), introduced by Ajzen and Fisbein in 1980 and developed by Davis in 1989 (Davis, 1989; Fishbein, M., and Ajzen, 1980). TAM described a relationship between the benefits of an information system and ease of use. TAM aims to explain and identify user acceptance to an adoption of technology. In this research will use the approach of TAM such as per perceived usefulness and perceived ease of use on intention to use Consite Shot Apps at PT HEXA Indonesia.

2.2. Theory Reasoned Action

Theory Reasoned Action (TRA) introduced by Ajzen, the basis for this theory is the person to behave in a way that all the information considers available around them. Basically, whether do or not to do action is determined by someone's intentions. Intention to do or not to perform a certain behavior influenced by two basic determinants such as attitude and social influence namely subjective norms (Hill et al., 1977).

2.3. Theory Planned Behavior

The Theory of Planned Behavior or TPB is an extension theory from TRA with the additional of perceived behavioral control, this factor represents people's actual control over behavior. The perceived behavioral control referring to the people's perception of the ease or difficult in performing the interest behavior (Ajzen, 1991).

2.4. Experience

In the context of this research, the experience factor studied is related to experience perceived by users' applications. User experience is the perception and response of the users as a reaction to the use of a product, system, or service. User experience is how users feel using a product, viewing or holding the product. The success of measurement of the implementation of a system is carried out to determine the user's ability to use the system, therefore, the goals of the use of the system able to be achieved. The measurement result is describing user satisfaction with the system. The user who has good and satisfactory experience will have intention to use the system.

2.5. Subjective Norms

Subjective Norms refers to a person's perception of social pressure that exist in the surrounding. This social pressure will affect to a person's decision to perform or not to perform the behavior. Subjective norms is a function of the individual's perceived expectations where one or more people around such as siblings or peers approve of the behavior and motivate the person to comply (Ajzen 1991). According to Yoo et al. (2012), the dimension of subjective norms are encouragement social including friends, family, external and important persons' influences.

2.6. Self-Efficacy
Self-efficacy is a state in which a person believes that they able to control the results of their efforts. Self-efficacy will affect the way individual interact with situation. The theory planned behavior place the determinant of self-efficacy in the general framework of the relations among belief, attitudes, intentions as well as behavior (Ajzen 1991).

2.7. Perceived of usefulness (PU)
Perceived of usefulness (PU) refers to a level where someone believes that the use of a particular system will improve the person's work performance (Davis 1989). Venkatesh (2000) stated the dimensions of perceived usefulness such as effectiveness, productivity, time saving and the importance of systems for person's job. According to Abdullah et al. (2016), there are several indicators that represent PU such as perform faster, improve job performance, increase productivity, and effectiveness.

2.8. Perceived of ease of use (PEOU)
Perceived ease of use refers to the level of a person believes that using a particular system in less effort. The user believes that the application is easy to use therefore it does not require hard effort (Davis 1989). Some indicators that able to represent the PEOU are easy to learn, easy to use, clear and understandable, and flexible.

2.9. Intention to Use
Intention is one of the aspects of human that tend to give greater attention of pleasure to or not to perform action (Conner, 2020). The intention to use is also defined as an individual's commitment to certain technologies and tendencies to perform certain specific behaviors and can be interpreted as a tendency to use products or services.

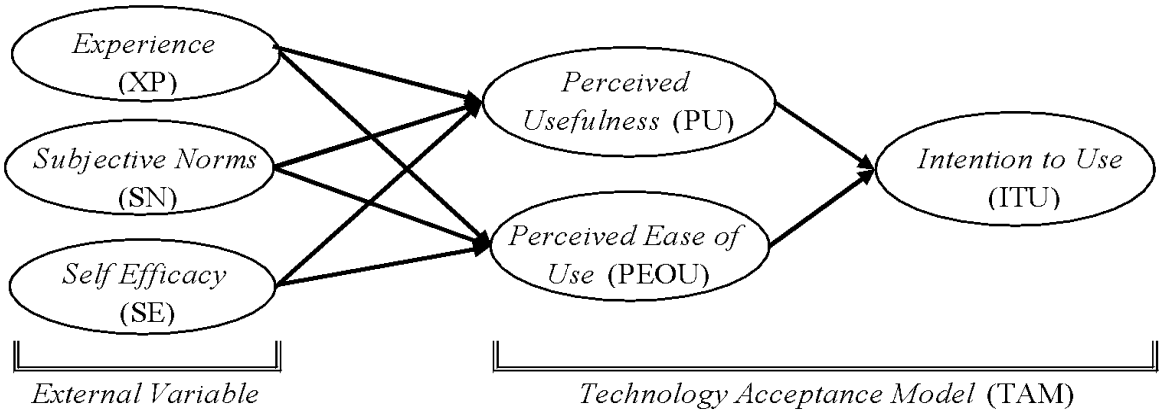

Figure 1. Research Conceptual Model

Based on Fig. 1 above, below are the hypotheses for this research such as:
H1: There is an effect of Experience on Perceived Usefulness
H2: There is an effect Subjective Norms on Perceived Usefulness
H3: There is an effect of Self-Efficacy on Perceived Usefulness
H4: There is an effect Experience on Perceived Ease of Use
H5: There is an effect Subjective Norms on Perceived Ease of Use
H6: There is an effect Self-Efficacy on Perceived Ease of Use
H7: There is an effect Perceived Usefulness on Intention to use
H8: There is an effect Perceived Ease of Use on Intention to Use

3. Methods and Data Collection
This research is a quantitative descriptive which primary data was collected using an online questionnaires survey form. The online questionnaires survey form was distributed to the respondent who are using the Consite Shot Application. The sampling technique used probability sampling technique with simple random sampling. The population in this study were the employees of PT. HEXA Indonesia which in total 115 respondents were able to be

collected. Respondent are required to answer several questionnaires with 5-Likert scale from totally agree until totally disagree. Data was collected from June – September 2021. The data obtained analyzed with SEM PLS (Structural Equation Modeling Partial Least Square). In order to support the research, beside the questionnaires data as primary data, this research also supported with secondary data from previous research and literature review.

4. Results and Discussions

4.1. Demographic Respondents

The respondent in this research were the employees who are working and using the Consite Shot Application during their daily activities. In total, there were 115 valid respondents and used for further analyzed. Based on the Table 1 below, the respondents dominated with male respondent at 114 respondents (99%). The age of the respondent's majority at 26-34 years old at 78 respondents (68%). The education level dominated at level High school at 99 respondents (86%). The position in the company majority as Technicians at 96 respondents (83%). Work Tenure in PT HEXA Indonesia dominated between 6-10 years at 70 respondents or 61%. The frequency in using the apps for working purposes per monthly basis majority below 5 times at 52 respondents or 45%. The duration using the apps majority 1 – 2 hours at 47 respondents or 41%.

Table 1. Demographic Respondents

Categories	Descriptions	Frequency	Percentages
Gender	Male	114	99
	Female	1	1
Age	18-25 years old	22	19
	26-34 years old	78	68
	35-42 years old	13	11
	> 42 years old	2	2
Education Level	High School	99	86
	Diploma Degree	9	5
	Bachelor Degree	1	8
	Others	1	1
Position	Unit Head	10	9
	Technician	96	83
	Administration	6	5
	Others	3	3
Work Tenure (in years)	< 5 years	21	18
	6-10 years	70	61
	11-15 years	16	14
	>15 years	8	7
Frequency using the Apps per monthly	< 5 times	52	45
	6 – 10 times	46	40
	11 – 20 times	12	11
	> 20 times	5	4
Duration using the Apps	< 1 hour	39	34
	1 – 2 hours	47	41
	2 – 4 hours	17	15
	> 4 hours	12	10

4.2. Analyze Measurement Model

The initial step to analyze the data was to measured the model or namely outer model. In this step, the data analyzed in convergent validity and discriminant validity. The convergent validity test carried out through an evaluation process on the loading factors values, for each indicator and the Average Variance Extracted (AVE) values, Cronbach's Alpha (CA) and Composite Reliability (CR) for each construct. The standard parameter for the loading factors on indicators values must be greater than 0.70 in order to meet the convergent validity. For the AVE's parameter as valid is more than 0.50 (Hair Jr, J. F., et.al. 2021). The measurement model path diagram for this research shown on Fig. 2 below.

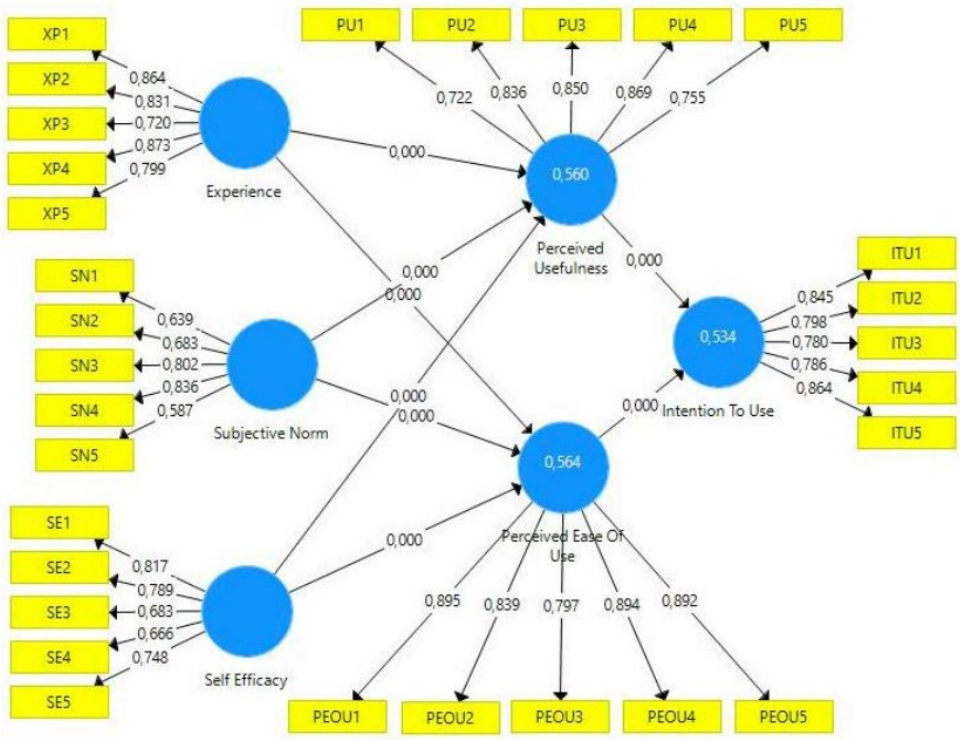

Figure 2. Measurement Model Path Diagram

Based on the Fig. 2 above, the results of measurement model path diagram found there were 5 indicators not valid as the Loading Factors (LF) value were below 0,70. These 5 indicators were removed from the measurement model, such as SN1 (LF:0.639), SN2 (LF:0.683), SN5 (LF:0.587), SE3 (LF:0.683), and SE4 (LF:0.666). In Table 2. shown the results of valid LF, AVE, CA and CR value were met the requirement for validity and reliability testing.

Table 2. Measurement Model

Constructs	Items	Loading Factors	AVE	CA	CR
Intention to Use	ITU1	0.845	0.665	0.873	0.908
	ITU2	0.798			
	ITU3	0.780			
	ITU4	0.786			
	ITU5	0.864			
Perceived Ease of Use	PEOU1	0.895	0.747	0.915	0.936
	PEOU2	0.841			
	PEOU3	0.798			
	PEOU4	0.893			
	PEOU5	0.892			
Perceived Usefulness	PU1	0.727	0.654	0.867	0.904
	PU2	0.833			
	PU3	0.849			
	PU4	0.867			
	PU5	0.757			

Self-Efficacy	SE1	0.854	0.683	0.768	0.866
	SE2	0.851			
	SE5	0.772			
Subjective Norms	SN3	0.724	0.741	0.725	0.849
	SN4	0.979			
Experience	XP1	0.864	0.671	0.876	0.910
	XP2	0.831			
	XP3	0.720			
	XP4	0.873			
	XP5	0.799			

For discriminant validity, this research using the HTMT and Fornel-Larcker criterion as shown in Table 3 below. For good quality criteria, the HTMT value is < 0.90 meaning the discriminant validity has been established between two reflective constructs (Henseler et al., 2015). While for the Fornell-Larcker criterion, the criteria for the square root of each construct's AVE are higher than its correlation with another construct. Based on Table 3 below the Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT) were met the criteria for discriminant validity.

Table 3. Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT)

Constructs	Experience	Intention to Use	Perceived Ease of Use	Perceived Usefulness	Self-Efficacy	Subjective Norm
Experience	*0.819*					
Intention to Use	*0.653* **0.736**	*0.815*				
Perceived Ease of Use	*0.588* **0.648**	*0.675* **0.752**	*0.864*			
Perceived Usefulness	*0.650* **0.739**	*0.675* **0.766**	*0.708* **0.794**	*0.808*		
Self-Efficacy	*0.510* **0.529**	*0.601* **0.622**	*0.701* **0.786**	*0.635* **0.723**	*0.743*	
Subjective Norm	*0.220* **0.243**	*0.181* **0.205**	*0.263* **0.252**	*0.334* **0.375**	*0.323* **0.433**	*0.716*

Note: Italic font: Fornell-Larcker Criterion, bold font: Heterotrait-Monotrait Ratio (HTMT)

4.3. Analyze Structural Model

After the measurement evaluation, the next step is the structural model was carried out by evaluating the R-square value on each construct. The greater of the value of R^2 meaning the greater the influence of certain exogenous latent variables on endogenous variables. The following coefficients of determination become parameters such as weak > 0.25, moderate > 0.50, and strong > 0.75.

Table 4. The R-Square Value

Endogenous Variables	**R-Square**	**R-Square Adjusted**	**Remarks**
Intention to use	0.533	0.525	Moderate
Perceived Ease of Use	0.550	0.538	Moderate
Perceived Usefulness	0.550	0.538	Moderate

Based on the Table 4, the R-square value for Intention to use was 0.525 which interpreted that 52.5% was influenced by variables perceived ease of use and perceived usefulness while 47.5% was influenced by others variable. The R^2-value for Perceived Ease of Use was 0.538 which interpreted that 53.8% was influenced by variables experience, subjective norms, and self-efficacy while 46.2% was explained by others variables outside of research. The R-square value for Perceived Usefulness was 0.538 which interpreted that 53.8% was influenced by variables experience, subjective norms, and self-efficacy while 46.2% was explained by others variables outside of research.

The evaluation of the F-Square value is used to determine the effect of the variable predictor of the dependent variable. The F-square value > 0.02 – 0.15 is categorized as weak influence of latent variable predictor at the structural level. For F-square value > 0.15 – 0.35 is categorized as moderate influence of the exogenous latent variables at the structural level. While the F-square value > 0.35 is categorized as strong influence of the latent variable predictor at the structural level.

Table 5. The F-Square Value

Construct	F-square	Remarks
Experience → Perceived Ease of Use	0.245	Moderate
Experience → Perceived Usefulness	0.395	Strong
Subjective Norms → Perceived Ease of Use	0.003	Weak
Subjective Norms → Perceived Usefulness	0.021	Weak
Self-Efficacy > Perceived Ease of Use	0.430	Strong
Self-Efficacy > Perceived Usefulness	0.194	Moderate
Perceived Ease of Use > Intention to Use	0.168	Moderate
Perceived Usefulness > Intention to Use	0,166	Moderate

Based on Table 5 above the strong influence was from the construct Experience on Perceived Usefulness and Self-Efficacy on Perceived Ease of use. Within the technology context, the experience of users more likely to hold stronger perception as to the perceived usefulness of the app, based on the user's ability to generate more beliefs and past behavior related to user's experience to the app. While the self-efficacy leads an individual to believe the ability to carry out the app adoption successfully.

4.4. Hypotheses Testing

For the hypotheses testing in the research shown on Table 6 below:

Table 6. Hypotheses Testing

Hypotheses	Original Sample	P-Value	T-Statistic	T-Value	Results
Experience → Perceived Usefulness	0.472	0,000	6,069	>1,96	H1 supported
Subjective Norm → Perceived Usefulness	0,105	0,173	1,364	>1,96	H2 not supported
Self Efficacy → Perceived Usefulness	0,346	0,000	4,385	>1,96	H3 supported
Experience → Perceived Ease Of Use	0,372	0,000	4,061	>1,96	H4 supported
Subjective Norm → Perceived Ease Of Use	-0,038	0,585	0,546	>1,96	H5 not supported
Self Efficacy → Perceived Ease Of Use	0,515	0,000	6,359	>1,96	H6 supported

Perceived Usefulness → Intention To Use	0,394	0,001	3,341	>1,96	H7 supported
Perceived Ease Of Use → Intention To Use	0,396	0,000	3,694	>1,96	H8 supported

Hypothesis 1: Experience → Perceived Usefulness
The t-statistic > t-table: 6.069 > 1.96 meaning that the hypothesis supported and the p-value <0.000 significant. The conclusion Experience has positive and significant effect on Perceived Usefulness. This result is in line with the previous results by (Abdullah et al. 2016; Irani 2000). The experience will develop the perceived of usefulness in using the Consite Shot App.

Hypothesis 2: Subjective Norm → Perceived Usefulness
The t-statistic < t-table: 1.364 < 1.96 meaning that this hypothesis is not supported. In conclusion there is no effect and insignificant Subjective Norms on Perceived Usefulness to use Consite Shot App. This result is corroborated with previous research by Abdullah et al. (2016). However, it is contrast with the result by Izuagbe et al. (2019), stated that subjective norms has a strong factor with perceived usefulness.

Hypothesis 3: Self Efficacy → Perceived Usefulness
The t-statistic value > t-table: 4.385 > 1.96 meaning that hypothesis 3 is supported. There is a positive and significant effect of Self-Efficacy on Perceive Usefulness. This result supported with previous research by Alalwan et al. (2016). With the capability of users to use the Consite Shot App will increase the perceived usefulness of the app.

Hypothesis 4: Experience → Perceived Ease of Use
The t-statistic value > t-table: 4.061 > 1.96 meaning that the hypothesis 4 is supported. There is a positive and significant effect of Experience on Perceived Ease of Use. This result corroborated with previous research by Hamid et al. (2016); Tubaishat (2018). With the greater user's experience of using the Consite Shot App will increase Perceived Ease of Use to the app.

Hypothesis 5: Subjective Norms → Perceived Ease of Use
The t-statistic < t-table: 0.546 < 1.96 meaning that this hypothesis 5 is not supported. There is no effect of Subjective Norms on Perceived Ease of Use. This result is contrast by previous research by Abdullah et al. (2016). This app will help to increase the performance and service and the subjective norms is not affected the perceived ease of use.

Hypothesis 6: Self Efficacy → Perceived Ease of Use
The t-statistic value > t-table: 6.359 > 1.96 meaning the hypothesis is supported. There is a positive and significant effect on self-efficacy and perceived ease of use. This result is in line with previous research by Abdullah et al. (2016). The greater user's ability in using the app will increase the perceived ease of use.

Hypothesis 7: Perceived Usefulness → Intention to Use
The t-statistic value > t-table: 3.341 > 1.96 meaning the hypothesis is supported. There is a positive and significant effect Perceived Usefulness on Intention to Use the Consite Shot App. This result is corroborated with previous research by Boon-Itt, (2019); Larasetiati and Ali, (2019). The greater perceived usefulness of the app will increase the intention to use.

Hypothesis 8: Perceived Ease of Use → Intention to Use
The t-statistic value > t-table: 3.694 > 1.96 meaning the hypothesis is supported. There is a positive and significant effect Perceived Ease of use on Intention to Use the Consite Shot App. This result is corroborated with previous research by Tahar et al., (2020). The greater perceived ease of use of the app will increase the intention to use.

5. Conclusion and Limitation

From the total 8 hypotheses, there are 2 hypotheses are not supported on this research. The subjective norms on perceived usefulness is insignificant and no effect meaning that the users of the Consite Shot App do not require the influence from other people nor the social environment as the decision to use the app included in the company policy

and the employees required to use the app during working. Subjective norms become important in the early phase of implementing the Consite Shot App when users have lack of knowledge and experience.

The most dominant factor to influence the intention to use the Consite Shot App is Perceived Ease of Use. The app needs to be users' friendly when they use the app for working. The research is limited to external variables such as experience, subjective norms, and self-efficacy, and endogenous variables namely perceived ease of use, perceived usefulness, and intention to use. For future research, may use some variables such as perceived risk, value, corporate image, benefits, satisfaction and so on. For the respondent may carry out to wider respondents in other industry or area.

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