THE ANALYSIS OF THE ACCEPTANCE USER ON ERP SYSTEM USING TECHNOLOGY ACCEPTANCE MODEL (TAM) IN PT ASTRA INTERNATIONAL TBK (ASTRAWORLD)

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ABSTRACT

PT. Astra Internasional Tbk is one of the biggest company in Indonesia which engaged in the automotive, agribusiness, and so forth. In the Automotive in automotive include sales, spare parts, and a car service. In February 2001, PT. Astra International Tbk establish new sales operation that is AstraWorld sales operation that engaged in membership and emergency services. PT. Astra International Tbk has implemented ERP system in all divisions and subsidiaries, one of them is AstraWorld. PT Astra International Tbk (AstraWorld) branch office of Pasteur Bandung, but not all employees of the office utilizing the ERP system to the maximum, then this study arranged to determine the factors that influence the acceptance of information technology user acceptance in the use of information technology. Technology Acceptance Model or TAM is a model used to gauge user acceptance of the technology. TAM was first discovered by Davis in which at the beginning of TAM, there are two variables that is the influence of usefulness and the influence easy to use. TAM model used in this study is TAM model that has been developed by (Gardner & Amoroso) for variable experience and (Venkatesh & Davis) for Quality of Information, where the other factors used are Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Use (ATU), Behaviour Intention to Use (BI) and Actual Use System (ASU). The results that has been obtained from this study is the relationship between each of the factors that affect the acceptance of an employee when using the ERP system, the ATU effect on ASU, ATU influence on BI, BI affect the ASU, IQ affect the PEU, IQ effect on PU, PEU influential terhdapa PU and PU influence on BI.

Keywords : PT. Astra International Tbk, AstraWorld , (TAM), ASU, ATU, IQ

1. INTRODUCTION

The competition in business world is increasingly complex, many things that must be renewed within the company to become a market leader in business that they develop. One thing that should be updated is to implement information technology systems, where in recent decades the development of information technology systems evolve rapidly. The development of information technology systems provide benefits to the company in realizing an increasing number of consumers to perform fast service and low cost compared to its competitors. There is a way that can be done by the company in the utilization of information technology systems is to implement technology Enterprise Resource Planning (ERP). ERP Software in PT Astra International Tbk (AstraWorld) is used for business processes by integrating the activities of the entire business, including sales, accounting and staffing. PT Astra International Tbk (AstraWorld) Pasteur Bandung branch, but not all employees of the office utilizing the ERP system to the maximum, While ERP systems are designed to facilitate completing the wide range of jobs in the company. The impact if the employee does not use the ERP system is the information will be hampered and the costs incurred by the company for the training will be worth - nothing. Therefore the IT division of the center want to find out how user acceptance of ERP systems (SAP).

1.1 Methode of Research

The method that used in this research is survey method, where the survey methods used to obtain information in the form of opinions from a number of people, where information that has been obtained will be collected, the information is collected through asking questions and information obtained from the sample. The research method aims to make the research process can work well and structured. The research method can be seen in the picture.

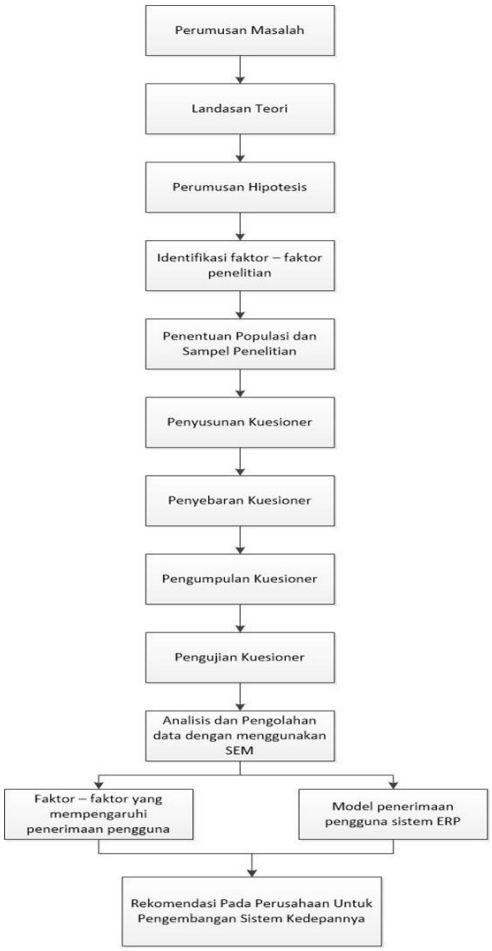


Image 1. Method of Research

1.2 Method of Analysis of User Acceptance

User acceptance analysis method that will be used as follows:

1. To be clear in this study and not cause any doubts to be answered properly, it would require an identification of the problem. Identification of the problem is a question that will be resolved through data collection. The problem identification is used as the basis for the filing of the theory - the theory chapter hypotheses, methods of analysis and decision making.
2. Gather theoretical references that relevant to the problems as well as previous studies as input that will be used to answer the problem formulation in the study.
3. Formulate hypotheses that will be used to answer the problem formulation while using new theory.
4. To identify research factors. Factors used in the study is TAM model External Variables, Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, Behavioral Intention to Use, Actual System Use.
5. Collecting data that is used to validate empirically or real against the hypothesis.
6. In this research instrument that has been used are questionnaire containing a list of questions to be answered by the respondents related based on the Likert scale scoring system.
7. Collected data that should be analyzed. The method used to process the data questionnaires from the Structural Equation Modem (SEM).
8. After analyzing the research completed, further is conclusion. The conclusion is the last step of a period of study in the form of brief answers to any formulation of the problem based on the collected data and analytical results.

1.3 *Structural Equation Model* (SEM)

Structural Equation Modelling (SEM) is one of the method that is currently used to close the existing weaknesses of the method of regression. The experts classify methods of research SENAM into two approaches. The first approach is referred to as Covariance Based SEM (CBSA) and the other approach is Variance Based SEM or better known as Partial Least Squares (PLS). To perform analysis using CBSEM then the software that is often used by AMOS and LISREL while for PLS software that is often used is smartPLS, warpPLS and XLStat.

1.4 *Partial Least Square* (PLS)

The method used to analyze the quality of data, hypotheses test, and path test analysis is the Partial Least Square (PLS). PLS is a multivariate statistical techniques that perform multiple comparisons between the dependent variable and multiple independent variables which are alternative methods of structural equation. PLS is one of a method for implementing the model Structural Equation Modelling (SEM). PLS model is used at the time of the basic design theory and models of weak measurement indicators do not meet the ideal measurement model. PLS can be used with limited sample and can be applied at all scales of the data (Ghozali, 2011). According to Ghozali (2011), PLS is a powerful method of analysis because it does not assume that the data must be in a particular measurement scale and also on a relatively small amount of sample. PLS software had been used in this study because the samples that is used in this study is not much, all the variables are latent variables, and there are two hypotheses multilevel models. The tests in this study using SmartPLS software version 2.0. The aim of PLS is to predict the effect of variable x to y and explain the theoretical relationship between the two variables. Therefore, the approach used to estimate the latent variables are considered as a linear combination of indicators, it was used to avoid indeterminacy problem and provide an exact definition of the component scores (Widodo, 2011). Latent variables are variables that can not be measured directly and require several indicators (manifest variables /

variable observed) as a proxy. In PLS, variables affecting other variables referred to the exogenous variables, while the variables that are influenced by other variables called endogenous variables. PLS can analyze constructs formed with reflective and formative indicators. This study uses a reflective indicator because in this study affect the latent variable indicator parameter estimates obtained by the PLS can be categorized into three. First, the weight estimate is used to determine the score of the latent variables. Second, reflecting the estimated path (path estimate) that connects between the latent variables and latent variables and indicators (loading). Third, with regard to the means and location parameters (regression constant value) for indicators and latent variables. To obtain these three estimates, PLS using iteration 3 stages and each stage of the iteration produces estimates. The first phase, to produce weight estimate, the second stage of the model yields an estimate for the inner and outer models, and the third stage to produce estimates of means and location (Ghozali, 2011).

1.5 *Technology Acceptance Model* (TAM)

Technology Acceptance Model (TAM) merupakan adaptasi dari TRA yang diperkenalkan oleh Fred Davis pada tahun 1986. Dimana TAM lebih dikhususkan untuk menjelaskan perilaku para pengguna komputer (Computer usage behavior). Secara skematik teori TAM digambarkan sebagai berikut:

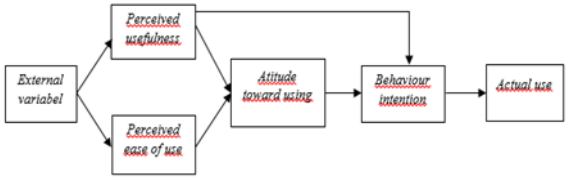


Image 2. Technology Acceptance Model (TAM)

2. CONTENTS OF RESEARCH

2.1 Framework of Research

Based on previous studies, the researchers intend to examine the effect of experience and quality information to the acceptance of the use of ERP systems by employees who use the ERP system technology. Framework or model of research that will be used is the Model TAM with the addition of external variables such modifications were made Gardner and Amoroso (2004) (experience) and Venkatesh and Davis (2000) (quality information). In this study, researchers used the experience and quality information as an external variable. The model developed is as follows:

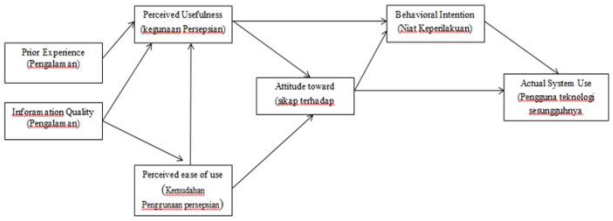


Image 3. Framework of Research

2.2 Feasibility Model Test

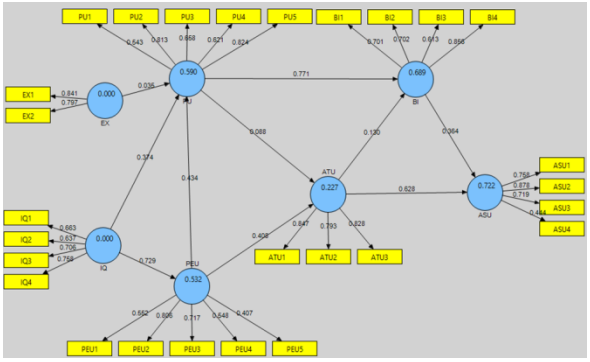
Analysis on PLS done in three stages:
1. Analysis of outer models
2. Analysis of inner models
3. Testing Hypothesis.

Analysis outer models that had been carried out is to ensure that the used of measurement worthy to be the measurements (valid and reliable). Analysis outer model can be seen from several indicators:
1. Convergent validity
2. Discriminant validity
3. unidimensionality

While analysis of the inner workings of the model / structural analysis models to ensure that the structural model is built robust and accurate. Evaluation inner model can be seen from several indicators which include:
1. The coefficient of determination (R^2)
2. Predictive Relevance (Q^2)
3. Goodness of Fit Index (GoF)

For Hypothesis testing is done by looking at the probability of its value and its t-statistic. For a probability value, p-value with an alpha of 5% is less than 0.05. T-table value for alpha of 5% was 1.96. So the hypothesis acceptance criteria is when the t-statistic> t-table.

Image 3. Structural Model



The following models of analysis of the model modification after removing some of the indicators where the value of the loading factor> 0.55 can be seen in the picture below

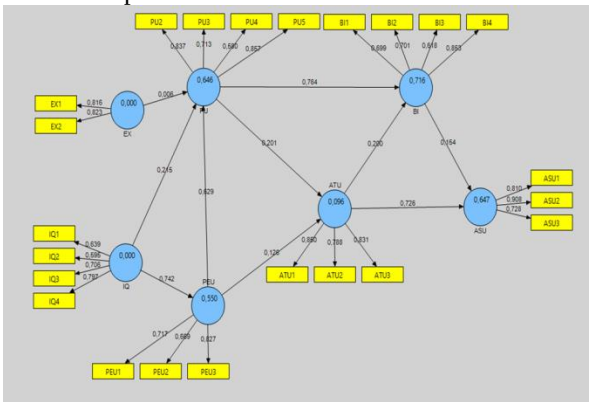


Image 3. Structural Model PLS Algorithm Results after 4 constructs in drop.

Based on the structural model output, was made a summary of the test results Convergent validity after the modifications that can be seen in Table

Tabel 2 Result for Cross Loading

	ASU	ATU	BI	EX	IQ	PEU	PU
ASU1	**0,810**	0,614	0,458	0,438	0,325	0,213	0,188
ASU2	**0,908**	0,759	0,339	0,383	0,357	0,178	0,274
ASU3	**0,728**	0,556	0,360	0,419	0,459	0,266	0,234
ATU1	0,657	**0,850**	0,369	0,421	0,252	0,207	0,193
ATU2	0,670	**0,788**	0,351	0,459	0,478	0,270	0,299
ATU3	0,627	**0,831**	0,341	0,453	0,284	0,224	0,247
BI1	0,154	0,160	**0,699**	0,250	0,586	0,531	0,690
BI2	0,070	0,078	**0,701**	0,065	0,416	0,682	0,611
BI3	0,771	0,700	**0,818**	0,587	0,321	0,272	0,333
BI4	0,230	0,197	**0,853**	0,247	0,667	0,731	0,764
EX1	0,440	0,467	0,371	**0,816**	0,371	0,433	0,248
EX2	0,378	0,418	0,335	**0,823**	0,114	0,183	0,252
IQ1	0,336	0,441	0,384	0,149	**0,639**	0,408	0,367
IQ2	0,460	0,431	0,286	0,403	**0,595**	0,384	0,279
IQ3	0,376	0,311	0,424	0,174	**0,706**	0,529	0,398
IQ4	0,209	0,125	0,696	0,169	**0,797**	0,653	0,705
PEU1	-0,024	0,004	0,512	0,171	0,469	**0,717**	0,641
PEU2	0,469	0,584	0,438	0,510	0,423	**0,669**	0,420
PEU3	0,162	0,100	0,696	0,193	0,717	**0,827**	0,677
PU2	0,221	0,145	0,787	0,225	0,581	0,597	**0,837**
PU3	0,027	0,101	0,519	0,134	0,430	0,681	**0,713**
PU4	0,367	0,483	0,463	0,432	0,461	0,470	**0,580**
PU5	0,248	0,218	0,678	0,159	0,573	0,636	**0,857**

In addition to test the construct validity, reliability test performed also constructs measured by the reliability of the composite indicator that measures the construct block. The results were as follows:

Tabel 3 Composite Reliability

	Composite Reliability
ASU	0.858
ATU	0.863
BI	0.811
EX	0.803
IQ	0.786
PEU	0.783
PU	0.838

Aside from the composite reliability, to assess the reliability of a construct can be done by looking at the Average Variance Extracted (AVE) and compare the value with the value AVE root of the correlation between the constructs. Hasilmya are as follows:

Tabel 4 AVE and AVE root

	AVE	Akar AVE
ASU	0.678	0.823
ATU	0.678	0.823
BI	0.522	0.722
EX	0.671	0.819
IQ	0.479	0.692
PEU	0.548	0.742
PU	0.579	0.769

Once the model is estimated to meet the criteria of discriminant validity, further testing structural models (inner model). Testing of inner models can be done in three ways. The third way is to look from R^2 (R -Squre), Q^2 and GoF . Here is the value of R-square:

Tabel 5 R – Squre

	R Square
ASU	0.647
ATU	0.096
BI	0.716
EX	
IQ	
PEU	0.551
PU	0.645

Here's Inner testing model can be done by looking at the value of Q^2 (predictive relevance). Q2 can be used to calculate the formula:

Q2 = 1 - (1-R12) (1-R22)……(1-Rp2)…

Q2 = 1 – (1 – 0,647) (1 – 0,096) (1 – 0,716) (1 – 0) (1 – 0) (1 – 0,551) (1- 0,645)

Q2 = 0,985

The last is to find the value of Goodness of Fit (GoF), for GoF value in PLS-SEM must be searched manually.

$GoF = \sqrt{\overline{AVE} \; x \; \overline{R^2}}$ .....Tenenhaus (2004)

$GoF = \sqrt{0{,}593 \; x \; 0{,}379}$

$GoF = 0{,}474$

According to Tanenhaus (2004), the value of small GoF = 0.1, GoF medium = 0.25 and GoF great = 0.38. Of testing R^2, Q^2 and GoF seen that the model established are robust. So the hypothesis testing can be done.

2.3 Analysis Hypothesis Testing

The bases used in testing the hypothesis is the value contained in the output path coefficients following:

Tabel 6 output path coefficients

	Original Sample estimate	*Mean of subsamples*	*Standard deviation*	*T-Statistic*	*Keterangan*
ATU -> ASU	0,726	0,733	0,057	12,771	Hipotesis Diterima
ATU -> BI	0,200	0,197	0,097	2,054	Hipotesis Diterima
BI -> ASU	0,154	0,148	0,065	2,376	Hipotesis Diterima
EX -> PU	0,006	0,005	0,086	0,075	Hipotesis Ditolak
IQ -> PEU	0,742	0,748	0,043	17,132	Hipotesis Diterima
IQ -> PU	0,215	0,212	0,096	2,241	Hipotesis Diterima
PEU -> ATU	0,126	0,120	0,208	0,605	Hipotesis Ditolak
PEU -> PU	0,629	0,634	0,094	6,702	Hipotesis Diterima
PU -> ATU	0,201	0,207	0,194	1,034	Hipotesis Ditolak
PU -> BI	0,764	0,764	0,085	8,988	Hipotesis Diterima

1. Testing Hypotheses H1 Experience has a positive influence on the perception of the usefulness (Perceived Usefulness).

From the table above it can be seen there is no significant effect between user attitudes towards experience (EX) with the perception of the usefulness (PU) with a coefficient of 0.006 and the value of the parameter T-statistic below 1.96 which

is equal to 0.075. Thus, the hypothesis H1 in this study was rejected.

2. Testing Hypotheses H2a Quality information has positive effect on perceived ease (Perceived ease of use). The user's perception of the quality of information (IQ) have a significant positive effect on the user's perception of the ease (PEU) with parameter coefficient of 0.742. This can be proved by looking at the value of the T-statistic that is above 1.96 which is equal to 17.132. Thus, the hypothesis H2a in this study received.

3. Testing Hypothesis H2b Quality of Information have a positive effect on the perception of the usefulness (Perceived Usefulness).

Significant positive effect was seen between the user's perception of the quality of information (IQ) with the perception of the usefulness (PU) with the parameter coefficient of 0.215. This can be proved by looking at the value of the T-statistic that is above 1.96 which is equal to 2.241. Thus, the hypothesis H2b in this study received.

4. Hypothesis Testing H3a Perceived of ease (Perceived ease of use) have a positive influence on the perception of the usefulness (Perceived Usefulness). From the table above it can be seen there is a significant positive effect between the user's perception of the ease (PEU) with user attitudes towards perceived usefulness (PU) with a coefficient of 0.629 and the value parameter Tstatistik above 1.96 which is equal to 6.702. Thus, the hypothesis in this study received H3a.

5. Hypothesis Testing H3b Perceived of ease (Perceived ease of use) have a positive influence on the attitude of Use (Attitude Toward Use).

From the table above it can be seen there is no significant effect between perceived ease (PEU) with an attitude of use (ATU) with a coefficient of 0.126 and the value of the parameter T-statistic below 1.96 which is equal to 0.605. Thus, H3b hypothesis in this study was rejected.

6. Perceived usefulness H4a Hypothesis Testing (Perceived Usefulness) has a positive influence on the attitude of the use of (attitude toward use).

From the table above it can be seen there is no significant effect between perceived usefulness (PU) with an attitude of use (ATU) with a coefficient of 0.201 and the value of the parameter T-statistic below 1.96 which is equal to 1.034. Thus, H4a hypothesis in this study was rejected.

7. Hypothesis Testing H4b Perception of usability (Perceived Usefulness) has a positive influence on interest in the usage behavior (Behaviour Intention to Use).

The user's perception of the usefulness (PU) have a significant positive effect on the usage behavior interest (BI) with the parameter coefficient of 0.764. It can be seen from the value of the T-statistic that is above 1.96 which is equal to 8,988. Thus, the hypothesis in this study received H4b.

8. Hypothesis Testing H5a attitudes toward the use of (attitude toward use) have a positive influence on the actual (Actual System Use). attitudes towards the use (ATU) have a significant positive effect on the usage behavior interest (ASU) with a parameter coefficient of 0.726. It can be seen from the value of the T-statistic that is above 1.96 which is equal to 12.771. Thus, the hypothesis in this study received H5a.

9. Hypothesis Testing H5B Attitudes toward the use (Attitude Toward Use) have a positive influence on interest in the usage behavior (Behaviour Intention to Use).

attitudes towards the use (ATU) significant have a positive effect on the usage behavior interest (BI) with the parameter coefficient of 0.200. It can be seen from the value of the T-statistic that is above 1.96 which is equal to 2.054. Thus, the hypothesis in this study received H5B.

10. Hypothesis Testing H6 Interests usage behavior (Behavioral Intention to Use) have a positive effect on the actual (Actual System Use).

use behavior (BI) significant positive effect on actual user (ASU) with a coefficient of 0,154 parameters. It can be seen from the value of the T-statistic that is above 1.96 which is equal to 2.376. Thus, H6 hypothesis in this study received

3. CONCLUSIONS AND SUGGESTION

3.1 Conclusions

Based on the analysis of SAP users in PT Astra International Tbk (AstraWorld) branch Pasteur Bandung, it could be concluded as follows:

1. The model of user acceptance of ERP systems (in this case SAP) in PT Astra International Tbk (AstraWorld) Branch Pasteur Bandung affected five constructs, namely: Information Quality (IQ), perceived Facility (PEU), perceived usefulness (PU), attitude towards use of (ATU) and the Behavior of Use (BI).

2. Results of the analysis showed that the correlation between the quality of information (IQ) affect the perceived ease (PEU) and perceived usefulness (PU), for example if provided a good and up to date will allow employees to complete the task and employees feel the benefit of the ERP system (SAP) the. Factors perceived ease (PEU) affect perceived usefulness (PU) for example, employees are using the ERP system (SAP) will facilitate the work that really - really helpful to improve the effectiveness of its performance. Factors perceived usefulness (PU) affect interest in the usage behavior (BI) for example employees already feel that the ERP system (SAP) to ease in completing the work, will affect employees intention to use the ERP system (SAP). Factors attitude towards use (ATU) affect the actual user (ASU) and the usage behavior of interest (BI) for example employees interested and have the intention to use the ERP system (SAP), the

employee will use the system and if otherwise employees will not use the system. Areas of interest perilau use (BI) affect the actual user (ASU), for example if the employee has no intention to use the ERP system, the employee will use it and vice versa.

3.2 Suggestions

As for the suggestion that submitted from the author of the research that has been done is as follows:

1. The model of user acceptance of ERP systems in PT Astra International Tbk (AstraWorld) branch Pasteur Bandung can be used as a benchmark to evaluate the acceptance of the ERP system (in this case is SAP) to support the company's business objectives.
2. In similar ERP studies, for the future could be adding another assessment factors that can be tailored to the characteristics of the research object itself, examples of external factors as age, gender, language and others - others.
3. In order to obtain the maximum benefit from the ERP system (in this case is SAP) it need to update the latest version of SAP in order to facilitate its use, optimize employee performance and reduce training costs are very expensive SAP.
4. For further research hopefully can be developed to expand coverage across the area of PT Astra International Tbk in Indonesia not only in PT Astra International Tbk (AstraWorld) Branch Pasteur Bandung only. With a greater number of respondents who expected to be obtained data and models are more valid to gauge user acceptance of SAP in PT Astra International Tbk.

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