Using Unified Theory of Acceptance and Use of Technology to Develop IS Strategic Planning

Wahyu Sardjono, Ivan Alexander, Widhilaga Gia Perdana

Abstract - PT. Republic Express is one of the companies in Indonesia engaged in the one stop logistics field which has been working for more than 30 years and located in South Jakarta. The current conditions at that company do not have a good Information Systems strategy, less use of Information Systems use and the company only makes a work plan based on the project plan to be taken. Therefore, PT. Republic Express requires an IS Strategic Planning using Enterprise Architecture. Before implementing the warehouse management system at company, first analyze the readiness of the implementation of the warehouse management system by distributing questionnaires to 200 employee respondents. The model used for this study uses Unified Theory of Acceptance and Use of Technology (UTAUT) Theory. The purpose of this study is to look for indicators, and new factors which will later be used to build a new model based on the results of the questionnaire respondent. The model used to form the new model is according to the theory model that developed into a new model that will form new factors and indicators. From the same factors used then the data the results of the questionnaire processed using factor analysis resulted in 5 new factors, namely, after obtaining 5 new factors, then processed into a new model that has been analyzed using linear regression.

Keywords: enterprise architecture, strategic planning, faktor analysis, UTAUT, warehouse management system

I. INTRODUCTION

A. Background
The development of information system technology in the era of globalization and digitalization is now very fast and affects human activities in the business sector. While information resources are the main resource in the company to be able to compete with other companies, then to improve competitive advantage for companies, efforts to try to implement information technology in order to improve the effectiveness and efficiency of business processes are mostly carried out in various companies, the purpose of writing this paper is to demonstrate innovation that will make the company's competitive advantage in business competition.

Enterprise Architecture Planning is one of the methodologies used to plan enterprise architecture that focuses on data architecture, application architecture and technology architecture that is oriented to business needs and how the architecture is implemented so that it can support the achievement of company goals.

II. METHODOLOGY

In this study descriptive method was used using Convenience Sampling techniques and survey approaches. Data collection techniques for conducting this research include:

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1. Observation this observation method is carried out for the current conditions that occur in PT RPX by making direct observations about operational activities.

2. Interview were carried out to the level managers to the top management to formulate information system strategy planning to achieve the company’s vision and mission.

3. Questionnaire Some samples that have been determined as respondents will be asked to answer a number of questions and statements related to evaluating the readiness of WMS implementation at the company. This questionnaire is distributed in the internal environment of the company.

Respondents simply choose one answer from the answers provided. Questions in the questionnaire were built based on the research instruments that had been made which came from eight factors from UTAUT. The scale technique used in this study is integrated rating scales using the 5 Likert Scale Indicator.

In this study will use a research model of the UTAUT model which is used to measure the level of employee acceptance of information system design concepts that will be applied to be able to compete with competitors. The proposed research model will use all the main independent variables and all dependent variables. The following is a picture of the proposed research model which is a modification of the UTAUT model:

![Figure 1: Proposed research Model](image)

Based on the proposed research model, the independent variables to be used are performance expectancy, effort expectancy, social influence and facilitating conditions. While the dependent variable that will be used is behavior intention and use behavior. In addition, two independent variables will be added, namely cost effectiveness and management effectiveness.

### Table 1: Variable and indicator Matrix

| Variable                  | Indicator                  |
|---------------------------|----------------------------|
| Performance Expectancy (PE)| Easy to use(PE1)           |
|                           | User expects(PE2)          |
|                           | Perceived usefulness(PE3)  |
|                           | Relative advantage(PE4)    |
| Effort Expectancy (EE)    | Time(EE1)                  |
|                           | Perceived easy to use(EE2) |
|                           | Complexity(EE3)            |
|                           | Ease of use(EE4)           |

### Table 2: Variable and indicator Matrix

| Variable                        | Indicator                        |
|---------------------------------|----------------------------------|
| Cost Effectiveness (CE)         | Cost reduction(CE1)              |
|                                 | Integrated knowledge(CE2)        |
|                                 | Cost evaluation(CE3)             |
|                                 | Cost estimation(CE4)             |
| Facilitating condition (FC)     | Infrastructure(FC1)              |
|                                 | Compatibility(FC2)               |
|                                 | Information technology(FC3)      |
|                                 | Team support(FC4)                |
| Behavioral intention (BI)       | Intention to use(BI1)            |
|                                 | System usage plan(BI2)           |
|                                 | Access to information(BI3)       |
| Use Behavior (UB)               | Effective(UB1)                   |
|                                 | Flexibility(UB2)                 |

### List Of Respondents

The method of collecting data with questionnaires was conducted on research samples related to the evaluation of the readiness of WMS implementation in PT RPX. The process of distribution until the collection of questionnaires took about 2 weeks. The questionnaire was distributed to 200 respondents. Respondents who participated in filling out the questionnaire were employees in each division. Questionnaires that are fully redistributed and answers are filled in completely so that it can proceed to the next stage, which is the data processing stage.

#### Demographic Data Of Respondents

The following is a descriptive description of the research respondents:

1. Respondent Data Based on Introduction to WMS

#### Tabel 3. The respondent’s data is based on the introduction of Warehouse Management Systems (WMS)

| Know WMS | Respondent | Percentage |
|----------|------------|------------|
| Yes      | 163        | 81%        |
| No       | 37         | 19%        |
| Total    | 200        | 100%       |

Based on the distributed questionnaire, as shown in table 3, data can be obtained that many respondents chose to know what WMS is.

2. Respondent Data Based on Gender
Tabel 4. The respondent’s data based on gender

| Gender     | Respondent |
|------------|------------|
| Male       | 153        |
| Female     | 47         |
| Total      | 200        |

Based on table 4., of 200 respondents, as many as 47 respondents were female, and 153 other respondents were male. The author assumes that gender does not significantly influence the introduction of the warehouse management system.

3. Respondent Data Based on Latest Education

Tabel 5. The respondent’s data based on education

| Level Education | Respondent |
|-----------------|------------|
| High School     | 10         |
| D3              | 18         |
| S1              | 167        |
| S2              | 5          |
| Total           | 200        |

From table 5, of the 200 respondents, the high school educated were 10 respondents, D3 were 18 respondents, S2 were 5 respondents and the most were those with S1 final education, 167 respondents.

4. Respondent Data Based on ages

Tabel 6 The respondent’s data based on age

| Age         | Respondent |
|-------------|------------|
| 21 – 30     | 85         |
| 31 – 40     | 73         |
| 41 – 50     | 30         |
| >50         | 12         |
| Total       | 200        |

Based on table 6, out of 200 respondents, 85 respondents were between 21 and 30 years old, 73 respondents were around 31 to 40 years old, 30 respondents were around 41-50 years old, while there were only around 12 respondents who were more than 50 years. The age of the respondent can influence the capture and accuracy of the use of the warehouse management system later.

Reliability and Validity Test

1. Reliability test

Tabel 7. Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .909             | 30         |

Reliability test is a questionnaire reliability testing technique that is most often used. Reliability testing helps in ensuring the stability, consistency, and accuracy of the variables in the research instrument represented by the value of Cronbach's Alpha (α). The value of Cronbach's Alpha (α)> 0.9 is said to be very good,> 0.8 said good,> 0.7 acceptable (George & Mallery, 2003). The reliability test results of research variables which can be seen from table 6 show that Cronbach's Alpha (α) from the 30 statements is equal to 0.909. From the numbers generated, it shows that the instrument variables used in this study are reliable for each statement used.

Analisa Faktor

KMO & Bartlett’s Test

If the KMO-MSA value is> 0.5 and the significant value (sig) or opportunity (p) <0.05, then the variables analyzed in the factor analysis are worthy of factoring. The table also shows the Bartlett’s test results worth 0.774 and sig 0.000.

Anti Image Correlation

The anti image correlation value indicates whether the variable can be used as a shared component or not with the following conditions:

1. MSA = 1 indicates that variables can be predicted without errors.
2. MSA ≥ 0.5 indicates that predictable variables need further analysis.
3. MSA < 0.5 indicates that the variable is not feasible for further analysis.

The calculation results for the value of anti image correlation in this study can be seen in table 9. The calculation results show all variables have a value of MSA > 0.5, so that all variables can be said to be feasible for further analysis.

Total Variance Explained

The eigenvalue / eigenvalue describes the role of variables in the shared factors that are formed.
From processing data using an eigen value greater than one, eight new factors were formed with the cumulative value of the overall variant extraction of 68.201%. Data processing is continued in the factor extraction process by using fixed number of factors in SPSS to reduce the factors formed. The author carries out testing with a fixed value of 6 factors 61.046%, 5 factors 56.936%. The test results can be seen in Table 10 below:

| Fixed number of factor | Cumulative(%) |
|------------------------|---------------|
| 8 faktor               | 68.201 %      |
| 6 faktor               | 61.046 %      |
| 5 faktor               | 56.936 %      |

The results of the fixed number of factors produced 3 possibilities, namely 8 factors, 6 factors and 5 factors. The author chose 5 factors because it was more complex and made it easier to build new factors.

Component Matrix

After the factor extraction process using fixed number of factors, the next step is to determine the variables of each new factor formed by rotating the component matrix. By using the fixed number of factors value of 5 factors and seeing the results of rotated component matrix, the following are the factors with the variables formed:

The First Factor is inefficiency and accessibility is a representation of a number of variables, consisting of variables:
1. Decision making efficiency (ME3), which is fast and effective decision making that can help businesses.
2. Perceived easy to use (EE2), which is a good system that is a system that is easy to use and understand.
3. User expects (PE2), that is, the system can meet user needs.
4. Customer satisfaction (ME2), namely customer satisfaction with services and products is very important.
5. Easy to use (PE1), namely the use of the system can facilitate users.
6. Cost reduction (CE1), which is the development of a system with the most cost efficient.

Second factor is negative business impact is a representation of a number of variables, consisting of variables:
1. Social Factors (SI2), namely the influence of others in making purchases.
2. Ease Of Use (EE4), which is the speed of system access that makes it easy for users.
3. Internal communication (EE5) namely good communication produces new knowledge through training.

The third factor is system performance is a representation of a number of variables, consisting of variables:
1. Perceived usefulness (PE3), namely the use of the system can improve user performance.
2. Time (EE1), namely the use of the system can reduce manual work.
3. Relative advantage (PE4), namely the use of the system can improve user performance.

The fourth factor is the appraisal framework is a representation of a number of variables, consisting of variables:
1. Cost evaluation (CE3), which is evaluating costs based on employee performance.
2. Support from top management (ME1), that is, support from top management is important.
3. Integrated knowledge (CE2), namely the estimated costs incurred for the construction of a system.
4. Infrastructure (FC1), namely infrastructure that adequately supports the use of the system.

The fifth factor is system dependency is a representation of a number of variables, consisting of variables:
1. Compatibility (FC2), namely computer devices that are competitive with information technology systems.
2. Intention to use (BI1), namely the desire of users to use the system very high
3. Effective (UB1), namely the use of a system that effectively increases the desires of users.
4. Normative social influence (SI4), namely the influence of co-workers in providing training to employees.
5. Network (FC5) = Network that can be accessed anywhere and stable.

III. RESULT AND DISCUSSION

New factors obtained through factor analysis are efficiency and efficiency, negative business impact, system performance, framework appraisal, system deployment. This new factor is what I will use to analyze the readiness of WMS implementation in the company.

The next step is the factor scoring or looking for the value of the five new factors formed. In the questionnaire the author shared with the research respondents, there was a statement regarding the level of understanding of the warehouse management system (WMS) system. The author uses a scale with a score range between one and ten to see the level of understanding of the respondents.

\[
\begin{align*}
X_1 &= \text{inefficiency and inaccessibility} \\
X_2 &= \text{negative business impact} \\
X_3 &= \text{system performance} \\
X_4 &= \text{appraisal framework} \\
X_5 &= \text{system dependency}
\end{align*}
\]

After doing the regression, the bottom value of each factor is obtained that meets the reliable criteria for the following calculation model:

\[
Y = B_0 + A_1X_1 + A_2X_2 + A_3X_3 + A_4X_4 + A_5X_5
\]

The following are the values obtained from the factor regression with the value of the respondent's level of understanding of the system warehouse management system:

\[
\begin{align*}
B_0 &= 8.000 \\
A_1 &= -0.042 \\
A_2 &= -0.018 \\
A_3 &= 0.056 \\
A_4 &= 0.286 \\
A_5 &= -0.002
\end{align*}
\]

By knowing these values, a systematic model of the analysis of readiness for the implementation of the warehouse management system is created as follows:

\[
Y = 8.000 - 0.042X_1 - 0.018X_2 + 0.056X_3 + 0.286X_4 - 0.002X_5
\]

Based on the model above, the readiness analysis model for the implementation of the warehouse management system (WMS) can be seen in Figure. 2.
obtained at the ideal value because the higher the Y value, the more ideal the value and readiness in applying the WMS.

IV. CONCLUSION

From this research we can conclude some important things for planning the implementation of the system and information technology strategies as follows:

1. 5 new factors have been found that influence the readiness to implement WMS in the company, namely inefficiency and accessibility, negative business impact, system performance, framework assessment, system dependence.

2. Each new factor is composed of several indicators and has a correlation with the factors formed. The first factor (inefficiency and efficiency), namely the decision making efficiency, is perceived as easy to use, user expects, customer satisfaction, easy to use, cost reduction. The second factor (negative business impact) is social factors, ease of use, complexity, internal communication. The third factor (system performance) is perceived usefulness, time, relative advantage. The fourth factor (framework appraisal) is cost evaluation, support from top management, integrated knowledge, infrastructure. The fifth factor (system dependency) is compatibility, intention to use, effective, normative social influence, network.

3. The mathematical model that is formed from the exploration of factors and the value of each factor to the analysis of the readiness of the implementation of the warehouse management system are as follows:

\[ Y = 8,000 - 0.042X_1 - 0.018X_2 + 0.056X_3 + 0.286X_4 - 0.002X_5 \]

**Explanation:**
- \( X_1 \) = inefficiency and accessibility
- \( X_2 \) = negative business impact
- \( X_3 \) = system performance
- \( X_4 \) = appraisal framework
- \( X_5 \) = system dependency

From this model it can be concluded that the highest value is obtained from the ideal model because the value of Y is 8.865.

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