Success Level Implementation of ERP at Indonesia State-Owned Enterprises Transportation Sectors

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Abstract. Implementation of the Enterprise Resource Planning (ERP) is an investment that does not appear in an organization. Indonesia Transportation State-Owned Enterprise PT Angkasa Pura II Indonesia has the leeway and autonomy to do ERP investments in supporting the achievement of its vision and mission. The World Economic Forum, put Indonesia on a ranking of 82 among the countries in the world in ICT utilization. This research was conducted to evaluate the performance of ERP implementation project. ERP implementation success rates seen from aspect of project management, determination of critical elements of urgency and contextual factors. The result that all independent variables influence significantly to the success of the implementation of ERP of SOE’s manufactures. The greatest contribution to the success of such in sequence are an element of urgency determination of critical factors, a contextual factor, and management of the project.

1. Introduction

The economic and technology changes especially development of information technology will have significant change in working environment and management. State-owned enterprises, as the main pillar national economic in Indonesia, have an important because state-owned enterprises are fostered to contribute to the development overall national economy in general. This should be realized from the total assets of all state-owned enterprises at the end of 2011 equals to Rp 2.963 trillion, with Capital Expenditure Rp 142 trillion and operation expense Rp 1,226 trillion. In the same year, the total State Budget Indonesia equals to Rp 1.311,4 trillion, expenditures allocation in the National Budget 2011 reached Rp121.9 trillion or 1.7 percent of the GDP.

By comparing the data, then the value CAPEX stateowned enterprises higher than that State Budget spending plan. This shows that the role of investment at stateowned enterprises very strategic, and it is important in the national economy.

In the strategic plan of state-owned enterprises, mentioned several the state-owned enterprises objectives are:

- To contribute to national economic development in general and state in particular.
- Pursue profit;
- Organizing Prize utility general provide work and/or services that high quality, and for the fulfillment adequate life of many people.
- A pioneering business activity that could not yet carried out by the private sector and cooperatives;
- Who was active provide guidance and assistance to weak economy the businessman, co-operatives, and the community.

This study is directed to:

1. The State-Owned PT Angkasa Pura II Indonesia
2. Study will be done only for the implementation of ERP, outside investment Hardware, Operating System, and Software supporters.

This research is intended as an initial step to measure the success of implementation ERP in state-owned companies Transportation sector.

2. Literature Review

Investment of Information Technology (IT) in the organization will continue to increase since the 1980s, and continue to receive the attention of the researchers [20]. Although many studies have examined impact of the investment in its own organization productivity, to measure business value from IT, but from empirical studies most of the results are not in agreement [6].

Evaluation level of success investment and Information Technology implementation of ERP triggered by the paradox view of Robert Solow about investment in the field of Information Technology. Robert Solow said: "we see computers everywhere except in the productivity statistics." (Erik). Many world scientists, has done much research on symptoms that was really paradox. While some studies of level of success of ERP implementation done by scientists among others[19].

Professor Matin Saban from Department of Business Administration Faculty of Economics and Administrative Sciences Bartın Province University, Turkey even considers in particularly highlighted stock exchange Information Technology in Accounting managerial steel industry in Turkey. Saban has examined the development of technology that has caused a change in accounting managerial and examine how high accounting managerial changes and stock exchange in the application of accounting managerial theoretically[16].

Next, Anthony Rossa did research on productivity benchmarking paradox in Information Technology in the field manufacturing by using a model Data Envelopment Analysis (DEA). Model DEA was used by Antony Rossa to assess the impact of IT to productivity [15]. The performance that attracted the attention Anthony Rossa among others was: investigated the association between resource allocation budget IT and costs, labor costs are considered as inputs to productivity achieved, and productivity achieved is considered as exodus (output). In addition to the link, Rossa also benchmarking the relative-TI made in manufacturing sector [15].

These issues are examined by using data performance that is collected from the database CompustatTM and survey Information WeekTM (IW) for IT executive. Results of the study showed that, through efficiency, the company that becomes efficient can improve their performance by reducing investment. Characteristics of a company that to be efficient are prepared so that other companies can imitate them to achieve high performance [15]. Myeong Ko and jan Guynes Clark did research by using the method of Multivariate Adaptive Regression Splines (MARS) in testing impact of investment in Information Technology [6]. This method has overcome many shortcomings from traditional approach, which will assume linear relationship between the interplay between and independent and distribution of errors normality. MARS offers a flexible regression analysis technique that can uncover the possibility of a relationship in data, including nonlinear (if any), and be able to provide additional expectation to investigate complex, such as the impacts IT in productivity (Mars, 2008)

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From the above, so the hypothesis in this research is:

| Hypothesis | Description |
|------------|-------------|
| H1         | Factors project management significantly affect to level of success implementation of ERP. |
| H2         | Determining factor critical element urgency project significantly affect to level of success implementation of ERP. |
| H3         | Contextual factors significantly affect projects to level of success implementation of ERP. |

3. Research Method

The Framework Model

Success level ERP implementation was influenced by 3 things, namely below diagram shows as ties between the success of implementation ERP and 3 factors namely:

1. Project Management
2. Determining Urgency Critical Element
3. Contextual Factors

Project Management
Performance ERP implementation can be done through Team members projects and not be done by end users (Wickramasinghe & Gunawardena, 2010). The achievement constitutes a number of objectives that has been determined, on parameters as follows [9].

- Clarity
- Accuracy
- Schedule
- Content
- System Stability
- Flexibility
- Reliability
- On Time and Budget
- Achievement/Company Objective (met)

Determining the urgency Critical element

There had been a difference high interest is significant given in Critical element (CE) between ERP implementation of success and failure, in which the importance is given in urgency in the implementation of a success. The CE examined among others are:

- BPR and minimum Customization
- Right Business with (legacy system)
- Plan and Business Vision
- Change Culture and Management Program
- Effective communication among department
- Managing user expectation
- Monitoring and performance evaluation;
- Project Champion
- Project Management
- Competency, Project Team composition
- Software development, test and trouble shooting
- Top management support
- User involvement
- User training

Vendors ERP platform using a different between your hardware, databases, and operating system, a certain package ERP only compatible with a specific database systems and certain operations. Thus, some literatures ERP software development to identify, test and problem-solving as essential material in the implementation of ERP [9].

Project Champion identified and associated with the success technological innovation. Because Project Champion can act as transformational. The success of implementation ERP requires project management is very good. This includes definitions are clear about the purpose, resource development and the plan, and evaluation progress of the projects. In addition, the problem, the factors that under is also important in providing the successful implementation of ERP. These factors such as:

1. Co-operation and team,
2. Composition team,
3. Effective communication,
4. A system in accordance with business system for a long time,
5. Cooperation and communication
6. Management expectations
Contextual factors

Relations between these factors contextual from an organization and its impact on the various operations that have been studied for a long time. Impact size organization in adoption, implementation and use of the information technology has received attention in academic literature.

- # of module
- Types of product
- # of employee involves with ERP

The Research Design

This Research, included in the kind of exploratory, which is nonexperimental and aims to explain the influence Project Management, Determining the urgency Critical element and Contextual factor against level of success implementation of ERP.

Population and Samples

The population taken from the members of Transportation companies namely PT Angkasa Pura II Persero.

The variables and measurement

The variables used in this research are:

1. Dependent variables: The successful implementation of ERP denoted as Y
2. Independent variables:
   a. Project Management, denoted as X1
   b. Determining the urgency Critical element, denoted as X2
   c. Contextual factors, denoted as X3

Instrument and Data Analysis

Instruments that are used to measure the success of implementation ERP that influenced by Management Project, Urgency Critical element, and Contextual factor is using questionnaire that was based on assessment system Likert scale. This method is scaling statement which uses distribution response as a basis for determining the value on a smaller scale. Number of alternative response that is in Likert scale there are 5 types. To reduce the tendency respondents that will select doubt because the object of assessment that is quite sensitive, in this research doubt answer was deliberately not given as an alternative answer to respondents.

Measurements The successful implementation of ERP

Measurements The successful implementation of ERP is by using questionnaires which given to employees who was appointed by LO. To reveal the success of implementation ERP system that has assessment Likert scale that was modified to four alternative answers. Preparing this questionnaire was also are grouped in to item of favorable and items of unfavorable. Preparing questionnaire success implementation of ERP done by using Likert scale assessment and not questionnaire asked respondents to choose alternative answers because two issues that are examined quite sensitive. Measurement tools that is used is Likert, with the answer categories that has been adjusted.

Measurements Management Project Management

Measurements of Project Management will be done by focusing on the factors that has been mentioned Measurements made with above. to respondents favoring the claim that in accordance with what they experience in the company ERP implementation performance by using evaluation system based on a Likert scale.
Measurements urgency Critical Element (CE)

This is done also by using questionnaires about CE. To reveal the urgency of CE, evaluation system by using Likert scale that was modified to 4 alternative answers.

Contextual factors measurement

Measurements Management Project Management and Contextual factors will be done with its focus on these factors that has been mentioned Measurements made with above. to respondents favoring the claim that in accordance with what they experience in the company, and used evaluation system based on Likert scale.

Data Analysis

To know the pattern of relationships between the urgency Critical element and Project Management and Contextual factor to the success of implementation ERP multiple regression analysis using Multiple linear regression analysis Linear Model as follows:

\[ Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 \]

With:
- \( Y \) is dependent variable
- \( b \) is constant
- \( X \) is independent variable

The final stages in the analysis data is as follows:
1. Trial validity and reliability of questionnaires to find out the extent this questionnaire was continuously against the variable.
2. The data processing and analysis of descriptive statistics to know the characteristics of respondents.
3. The data processing with multiple regression analysis, to look for the influence of project management, the urgency Critical element and contextual factor to the successful implementation of ERP.

Data processing was done by using the program SPSS.

4. Results and Discussion

PT Angkasa Pura II Indonesia

Angkasa Pura II Indonesia is the largest stateowned organization in transportation sector in Indonesia. It is also designed to be the role model for others in the industry, since it serves the main international flight gate to the country. Therefore, the researcher think that it will be a good object to study about the ERP implementation representing the industry in the country.

Respondent

Respondent were active in the manager position at PT Angkasa Pura II. Questionnaires are given in the form of written (paper) and on-line

| Management area                        | # respondent | %    |
|----------------------------------------|--------------|------|
| Engineering and Operations             | 4            | 16.6 |
| Finance                                | 3            | 12.5 |
| Air Service and Facility               | 2            | 8.4  |
| HR, IT and General affair              | 7            | 29   |
| Commercial and Business development    | 5            | 21   |
| Others                                 | 3            | 12.5 |
| Total                                  | 24           | 100  |

Table 2. Demography Respondent
Hypothesis

Hypothesis using methods resampling bootstrap. From this procedure bootstrapping will produce the TStatistics from each exogenous variable (independent variables) to the variable endogenous (the interplay between).

| Inner Model Path | Standard error | T-Statistic |
|------------------|----------------|-------------|
| H₁               | 0.031          | 1.385       |
| H₂               | 0.005          | 9.128       |
| H₃               | 0.011          | 3.031       |

From the result procedures bootstrapping above, it can be done hypothesis refers to Rule of Newer technologies such as Thumb accordance with the following:

- The significance (two-tailed) level 10 percent to 1.65
- The significance (two-tailed) level 5% of 1.96
- The significance (two-tailed) level 1 percent to 2.58

Table 4. Hypothesis

| The hypothesis | R²   | T-Value | Conclusion |
|----------------|------|---------|------------|
| H₁             | 0.793| 2.317** | accepted   |
| H₂             |      | 9.728** | accepted   |
| H₃             |      | 5.642** | accepted   |

** significance at \( P < 0.01 \)

Thus, the conclusion to be drawn from the table above are:

H₁: Project management has significant affect on the success level of implementation ERP.
H₂: Determining urgency of CE has significant affect to the level of successful implementation ERP.
H₃: Contextual factors has significant affect to the success level of implementation ERP.

With regression model:

\[ Y = 1.1253 + 0.1531X₁ + 0.4279X₂ + 0.1942X₃ \]

5. Conclusions

From the analysis, so it can be drawn conclusions as follows:

1. Factors project management which is an important factor that significantly affect the state-owned enterprises Transportation for successful implementation of ERP. It is important to promote a deep understanding to benefit (relative advantage), security (uncertainty), the extent (compatible for supporting), difficulties (complication), trial (triability), and the observation (observability), which is a leading indicator of the major technology factors. However, it was found that the strongest state-owned enterprises Transportation successful ERP implementation indicators are technological innovation services as well as observation from the experience of other organizations.

2. Successful implementation of ERP serve a great potential to be adopted by the state-owned Transportation in terms of determining the urgency critical element project. From the factors determining the urgency critical element project, the most important for state-owned enterprises Transportation in successful implementation of ERP is the support from top management, high innovation organization, and provisions by experts. In this research we found that the factor that most
powerful influence state-owned enterprises Transportation for successful implementation of ERP is determining factor critical element urgency project.

3. In addition, determining factor urgency elements critical projects is the first, contextual factors projects in the second. Competition, the type of industry, and government policy, is a strong indicators in this factor.

4. Factors project management, determining the urgency critical element project, and relevant projects leading to The success of implementation ERP. After some testing, it can be declared that the result third hypothesis is to be consistent. Those three factors that is leading to the dependent variables, not to affect each other.

Recommendations
1. It is expected that the model that is used in this research can be used as a tool to optimize implementation on ERP, both before and during the process of implementation.

2. Overall, researchers can use this model to help integrate to became a part of their own model related to successful implementation of ER.

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