Top Management Commitment in Enterprise Resource Planning Implementation Success : Preliminary Study in Indonesian State-Owned Enterprises

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Abstract

This preliminary study held in two Indonesian state-owned enterprises (SOEs) showed empirical evidence that top management commitment was perceived to be the most important critical factor contributing to enterprise resource planning (ERP) implementation success, compared to top management support and top management involvement. Therefore, top management and middle management must continually show commitment during the ERP implementation process. This finding could serve as a reference for further study in a larger number of Indonesian SOEs.

Keywords : Enterprise Resource Planning (ERP) Implementation Success, Top Management Commitment, Indonesian State-Owned Enterprises (SOEs)

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1. Introduction

In order to survive in a rapidly changing business environment, organizations must improve their own business practices and procedures. Enterprise resource planning (ERP) systems can be considered as the most important development in the corporate use of information technology and the backbone of organizations [Jafari et al., 2006]. An ERP system is an integrated software solution, typically offered by a vendor as a package that supports the seamless integration of all the information flowing through a company, such as financial, accounting, human resources, supply chain, and customer information [Davenport, 1998].

ERP helps companies gain a competitive edge by streamlining business processes, integrating business units, and providing organizational members greater access to real-time information [Jones and Price, 2004; Everdingen et al, 2000]. Moreover, significant benefits for adopting ERP system include reduced operating and maintenance time and costs, improved customer service management, better production scheduling, reduced inventory and tightened supply chain links, etc. [Davenport, 1998; Markus and Tanis, 2000].

However, ERP implementation is different from traditional systems development because ERP systems integrate all enterprise information systems, which can cause radical change of organization business processes [Nattawee and Siriluck, 2008]. Therefore, members at various levels of the hierarchy will need to be involved throughout the project [Jarrar et al., 2000; Nah et al., 2001] to carefully manage it in order to reap the benefits of an ERP solution.

Numerous authors have identified a variety of critical success factors (CSFs) of an ERP implementation. The main CSFs include top management support, ERP teamwork and composition, project management, training and education, interdepartmental communication and collaboration, and so on [He, 2007]. But previous studies have shown that top management support is considered as the most important success factor for ERP implementation [Nattawee and Siriluck, 2008; Nah et al., 2001; Akkermans and van Helden, 2002; Bingi et al., 1999; Buckhout et al., 1999; Crisostomo, 2008; Davenport, 2000; Dong, 2001; Ehie and Madsen, 2005; Esteves and Pastor, 2000; Holland and Light, 2001; Somers and Nelson, 2001; Sumner, 1999; Wixom and Watson, 2001; Zabjek et al., 2009; Zarotsky et al., 2006]. Combinations of top management support and participation [Zhong and Min, 2004], support and commitment [Davenport, 1998; El Sawah et al., 2008; Ifinedo, 2008; Nandhakumar, 2005; Somers, 2004], involvement, support and commitment [Hedman, 2010; Zhou-Sivunen, 2005], involvement and participation [Byrd and Davidson, 2003; De Lone, and McLean, 1992; Liang, 2007] were also found.

These various top management roles (support, participation, involvement, commitment) are needed during ERP implementation because they can help the business process reengineering and change management be implemented much easier [Ehie and Madsen, 2005]. Moreover, top management roles create positive attitude of users toward the ERP system considering that

during an ERP implementation, the entire structure of a company is turned upside down. The presence of the top management during the ERP implementation could give strength for the employees' confidence in the whole project.

With government policies and regulations which force continuous changes, SOEs have to become market-driven enterprises in order to be world class companies. In Indonesia, there are 140 state-owned enterprises (SOEs) which belong to 18 industries, such as insurance, energy, mining, forestry, plantation, fishery, construction, banking, printing, and so on [http://www.bumn.go.id/daftar-bumn/on 21]. With the uncertainty of market environment 001 and urgency to improve public service due to increasing competition and rising customers' expectations, ERP systems have been used by several SOEs in Indonesia in order to achieve better business performance and gain competitive advantages. Some SOEs are in the planning and implementation phases, others are in the stabilization phase, and many are in the improvement phase.

Previous studies found that no matter if it is in the state-owned company, or the foreign-invested company, top management support seems to be one of the essential issues to ensure the ERP projects to be successful, in terms of designing and controlling the whole implementing process [Zhou-Sivunen, 2005]. With this empirical result and taking into consideration the facts that SOEs needed more professional personnel than non-SOEs during ERP implementation [Yusuf, 2006], it could be assumed that top management support, involvement, and commitment would be the important factors. Therefore, the purpose of this study is to examine "whether the top management roles could give positive influence on ERP implementation success in Indonesian state-owned enterprises."

2. Literature Review

ERP implementation success is perceived as the completion of assumed goals and implementation scope within a planned time and budget, while achieving user satisfaction [Lyytinen, 1998]. Similarly, the definition of an ERP implementation success given by Brown and Vessey [Brown and Vessey, 2003] captures all aforementioned dimensions, as they define project success as "an up-and-running system with agreed-upon requirements delivered within schedule and budget." Likewise, Shanks et al. [Shanks et al., 2000] notes that success is mainly concerned with completion of the ERP project on time and within budget for acceptable standards in the first two phases (planning and implementation phases) of ERP process model. Furthermore, success is more concerned with the perceived contribution of the system to organizational performance in the last two phases (stabilization and improvement phases) of ERP process model.

Since ERP implementations have always been extremely complex projects that are very difficult to control [Francoise et al., 2009], consequently, its success is not easy to achieve for every organization [He, 2007]. Therefore, many researchers have studied critical success factors (CSFs) for ERP implementation.

Study in two Chinese companies, state-owned company and foreign-invested company, stated six CSFs, namely ERP teamwork and composition, top management support and management style, business process reengineering (BPR) and software modifications, understanding of ERP system and having clear business plan and vision, personnel resources, sufficient education and training [Zhou-Sivunen, 2005]. In other study done between ERP implementation in Australia and China [Shanks et al., 2010], it was found that two CSFs that were common for both companies through most stages of the implementation projects (planning, implementation, stabilization, improvement) were top management support and formation of a balanced project team. Likewise, top management support and clear goals and objectives have been shown to be the extremely important factors for ERP implementation in Malaysia [Jafari et al., 2006]. Previous studies [Muscatello et al., 2003; Nah and Delgado, 2006; Umble et al., 2003] similarly stressed the importance of top management support through the ERP implementation. Top management support and the suitability of software and hardware were the extremely important CSFs for ERP implementation in Finland [Jiang, 2005].

Principally, majority of IT literatures stressed the importance of top management support in the ERP implementation [Zabjek et al., 2009], because top management support has a huge positive impact on ERP implementation success [Nah et al., 2001; Bingi et al., 1999; Umble et al., 2003]. For instance by improving the organizational fit to the package and keeping eye on effective project management [Sawah et al., 2008]. When top management supports ERP implementation project publicly, other organizational members usually interpret such moves positively and act accordingly [Davenport, 1997]. Conversely, a lack of support from top management could spell disaster for those systems.

The roles of top management in ERP implementation consists of developing an understanding of the capabilities and limitations of ERP, establishing reasonable goals for ERP systems, exhibiting strong commitment to the project, and communicating the IT strategy of adopting ERP to all employees [McKersie and Walton, 1991].

Top management is essential to allocate the necessary resources (financial and human resource) and time for the project to be executed properly [Jarrar et al., 2000; Nah et al., 2001]. Top management must provide direction and define new objectives in order to give employees a clear vision of the orientation the company is taking, through the new system to be implemented. It must also approve and support all the decisions that are made [Francoise et al., 2009].

Top management is expected to support the resolution of political problems if necessary. Limited financial support contributed to a rushed ERP implementation process, project team members were overloaded and thus high staff turnover rate, ineffective knowledge transfer, and political problems occurred. Insufficient commitment could lead to political problems which hindered the implementation process (causing poor BPR, widespread user resistance to change and low user satisfaction) [Wong et

al., 2010].

Top management need to publicly and explicitly identify the project as a top priority [Nah et al., 2001]. Top management must be fully committed with the involvement to the implementation effort [Holland et al., 1999]. Successful ERP implementation completely depends upon strong and persistent top management involvement, because top management support has to be included in each step and in all company levels [Zabjek et al., 2009].

Top management should conduct periodic meetings with the project team to revise the project plan, double-check performance measures and track carefully any deviations. This involves timely provision of comprehensive control information at each stage in the implementation process [Sawah et al., 2008].

From previous studies that concluded top management support as one of the most important factors during ERP implementation, there are many roles that should be done by top management in order to achieve ERP implementation success. To simplify them and later would be used as the definition in this study, the top management roles are characterized as giving support for the ERP project and all the entities in the organization, being involve in achieving objectives for ERP implementation project by participating in the implementation process, and fully committed to allocate financial and human resources and the implementation effort, project schedule and goals definition.

The definition of ERP implementation success is the completion of the ERP project and the implementation scope within a planned time and budget, the contribution of the ERP system to organizational performance, while achieving user satisfaction.

3. Research Methodology

3.1. Data Collection

A cross-sectional survey was conducted to test the proposed research question empirically. Aside from collecting demographic and other related information of the respondents, e.g., gender, age, marital status, education background, work experience, position, and organization characteristics, the respondents were also asked to rate the degree of agreeableness of their perception on top management roles and ERP implementation success based on a 5-point Likert scale. The scale is ranged from 1 to 5 : 'strongly disagree, 'disagree, 'neither agree nor disagree', 'agree', and 'strongly agree' respectively. The following statements were ERP implementation success and top management roles derived from the definitions stated in the above literature review.

Statements of ERP Implementations Success :

1. ERP implementation project was completed on schedule.
2. Our ERP implementation progressed well as was originally planned.
3. ERP implementation project was completed within the budget as initially planned.
4. The scope of our ERP system was well matched with our company's needs.
5. I am very satisfied with performance of the ERP system.

6. Overall, I am very satisfied with the ERP system.

Statements of Top Management Roles :

1. Top management support :
   a. Top management supported the adoption and use of our ERP system.
   b. Top management supported the ERP implementation process.
   c. All levels of management supported the overall goals of the ERP entity.
   d. Top management was prepared to support the project team's efforts to manage change generated by the ERP system implementation.
   e. Top management support gave good influence on the promotion of the ERP project.
   f. Top management supported for the project and the management members' involvement in implementation duties.
   g. Top management was responsive of the employees' reactions to the ERP implementation project.
   h. Top management had clearly defined the ERP entity's business goals.
2. Top management commitment :
   a. Top management was knowledgeable about the ERP system.
   b. ERP implementation was regarded as high priority by top management.
   c. Top management gave constructive feedback on ERP implementation.
   d. Top management was enthusiastic about the success of ERP system.
   e. Top management continuously championed the ERP project.
3. Top management involvement :
   a. Top management supported the need for long term resources in ERP implementation.
   b. Top management was prepared to deal with the employees' reactions to the ERP implementation project.
   c. Top management understood the project goals and complexity, labor required, existing limitations, required capital investment and project inevitability.
   d. Top management participated in the project scheduling and goals definition.
   e. Top management participated in the whole ERP project implementation.

After scale purification, top management role's dimensions and ERP implementation success had Cronbach alpha ranging from 0.85 to 0.91 or higher than 0.70 (see <Table 1>).

〈Table 1〉 Summary of Cronbach's Alpha Coefficient of Reliability for ERP Implementation Success and Top Management Roles

Variable/Dimensions	N	Items	Items Drop	Alpha
ERP Implementation Success	77	6	0	0.89
Top Management Role :				
Top management support	79	8	0	0.91
Top management commitment	81	5	0	0.88
Top management involvement	80	5	0	0.85

3.2 Respondent Profiles

Among the 140 Indonesian state-owned enterprises (SOEs), letters of permission to conduct research were sent to 10 SOEs which have implemented ERP for a minimum of one year on the month of January 2011. The first batch was collected on March 2011 and there were two SOEs which participated in this study.

SOE 1 is the Indonesian government security printing and minting corporation which was established in 1971. Its main task is to print banknote, coins, and non-money notes. Total employees were more than 1,000.

Majority of respondents in SOE 1 were key-users (51%), followed by end-users (33%), and administrative support (11%). SOE 1 has just used Oracle as its ERP system since January 2010, and majority of the respondents had no experienced using ERP system (93%). Most of the respondents were staff (72%) aged 45~54 years (45%) with undergraduate degree (43%) and had been working in SOE 1 for more than 10~15 years (21%) and 15~20 years (21%).

Respondents were also asked to give their direct superiors' demographic data. In SOE 1, the roles of respondents' direct superior were end-users (35%) and key-users (31%), who had no previous experiences with ERP system. Positions of their direct superior were supervisors (58%) and managers (35%), aged 45~54 years old (82%) with academy degree (49%) and had worked in the company for more than 25~30 years (43%).

SOE 2 is a state-owned oil and gas company, which was established in 1957 and engages in

〈Table 2〉 Demographic Characteristics in SOE 1

	Respondents		Direct Superiors	
	N	%	N	%
Role in ERP :				
Project Manager	0	0.0	2	3.9
Project Coordinator	0	0.0	3	5.9
Project Team Member	1	1.8	3	5.9
Key User	28	51.0	16	31.4
End User	18	32.7	18	35.3
Admin. Support	6	10.9	2	3.9
Others	**2**	**3.6**	**7**	**13.7**
Total	55	100.0	51	100.0
ERP Experience :				
1 year	37	66.1	29	52.7
2 years	4	7.1	3	5.5
3 years	0	0.0	1	1.8
Never	15	26.8	11	20.0
Don't know	**0**	**0.0**	**11**	**20.0**
Total	56	100.0	55	100.0
Position :				
Manager	2	3.7	19	35.2
Supervisor	13	24.1	31	57.4
Staff	**39**	**72.2**	**4**	**7.4**
Total	54	100.0	54	100.0
Sex :				
Female	10	18.2	8	15.4
Male	**45**	**81.8**	**44**	**84.6**
Total	55	100.0	52	100.0
Age :				
25~34 years	6	10.7	4	7.3
35~44 years	24	42.9	5	9.1
45~54 years	25	44.6	45	81.8
55~64 years	**1**	**1.8**	**1**	**1.8**
Total	56	100.0	55	100.0
Education :				
< High School	1	1.8	6	10.9
High School	16	28.6	8	14.6
Academy	5	8.9	27	49.1
Undergraduate	24	42.9	12	21.8
Master	**10**	**17.8**	**2**	**3.6**
Total	56	100.0	55	100.0
Years in Company :				
> 2-5 years	1	1.8	1	1.8
> 5~10 years	8	14.3	4	7.1
> 10~15 years	12	21.4	3	5.4
> 15~20 years	12	21.4	5	8.9
> 20~25 years	4	7.1	7	12.5
> 25~30 years	10	17.9	24	42.8
> 30 years	9	16.1	10	17.9
Don't know	**0**	**0.0**	**2**	**3.6**
Total	56	100.0	56	100.0

oil and gas exploitation, domestically and overseas, as well as in other exploitation associated with or supporting oil and gas operations. SOE 2 has implemented ERP since January 2008 and used MySAP as their ERP product. SOE 2 employed more than 1,000 employees.

The role of respondents in SOE 2 was key-users (37%) with no experience of ERP system since they were mostly staff (86%). They were 25~34 years old (79%) with undergraduate degree (75%), and had worked in the company for 1~2 years (46%) and > 2~5 years (32%). Direct superiors' roles were project coordinator (32%) with ERP system experience for more than 5 years (37%) and were in the position of manager (57%). Most direct superiors' were 45~54 years old (50%), had master degree (52%), and had worked in the company for 1~2 years (32%) and > 2~5 years (25%).

4. Results

Respondents had three perceptions towards ERP implementation in their companies : successful, not-yet-successful, and unsuccessful. The second perception (not-yet-successful) was accommodated because when asked "what is your perception regarding ERP project in your company?" with two-choice answer (successful and unsuccessful), some respondents added one more choice : not-yet-successful. Therefore, those three perceptions were analyzed to see the means of top management roles (see <Table 4>).

There were 23% respondents in SOE 1 who perceived ERP implementation as unsuccessful, but majority of the respondents (69%) perceived

〈Table 3〉 Demographic Characteristics in SOE 2

	Respondents		Direct Superiors	
	N	%	N	%
Role in ERP :				
Project Manager	0	0.0	4	16.0
Project Coordinator	1	3.7	8	32.0
Project Team Member	4	14.8	3	12.0
Key User	1	3.7	0	0.0
End User	10	37.0	6	24.0
Admin Support	5	18.5	1	4.0
Others	**6**	**22.2**	**3**	**12.0**
Total	27	100.0	25	100.0
ERP Experience :				
1 yrs	10	35.7	1	3.7
2 yrs	4	14.3	0	0.0
3 yrs	0	0.0	5	18.5
4 yrs	0	0.0	1	3.7
5 yrs	1	3.6	3	11.2
> 5 yrs	1	3.6	10	37.0
Never	12	42.8	0	0.0
Don't know	**0**	**0.0**	**7**	**25.9**
Total	28	100.0	27	100.0
Position :				
Manager	0	0.0	16	57.1
Supervisor	4	14.3	3	10.7
Staff	**24**	**85.7**	**9**	**32.2**
Total	28	100.0	28	100.0
Sex :				
Female	16	57.1	4	15.4
Male	**12**	**42.9**	**22**	**84.6**
Total	28	100.0	26	100.0
Age :				
< 25 years	2	7.2	0	0.0
25~34 years	22	78.5	1	3.6
35~44 years	1	3.6	12	42.9
45~54 years	3	10.7	14	50.0
Don't know	**0**	**0.0**	**1**	**3.5**
Total	28	100.0	28	100.0
Education :				
Academy	2	7.2	0	0.0
Undergraduate	21	75.0	9	33.3
Master	5	17.8	14	51.9
Don't know	**0**	**0.0**	**4**	**14.8**
Total	28	100.0	27	100.0
Years in Company :				
1~2 years	13	46.5	9	32.0
> 2~5 years	9	32.1	7	25.0
> 5~10 years	3	10.7	2	7.1
> 10~15 years	0	0.0	2	7.1
> 15~20 years	3	10.7	1	3.6
> 20~25 years	0	0.0	1	3.6
> 30 years	0	0.0	1	3.6
Don't know	**0**	**0.0**	**5**	**18.0**
Total	28	100.0	28	100.0

〈Table 4〉 Descriptive Analysis : Top Management Roles and ERP Implementation Success

	Mean SOE 1	SD	N	Mean SOE 2	SD	N	Mean Total	SD	N
Unsuccessful :									
TM support	3.33	.51	12	-	-	-	3.33	.51	12
TM commitment	2.92	.83	12	-	-	-	2.92	.83	12
TM involvement	3.55	.44	12	-	-	-	3.55	.44	12
Not-Yet-Successful :									
TM support	3.80	.42	36	3.51	.64	18	3.70	.52	54
TM commitment	3.52	.53	36	3.28	.48	18	3.44	.52	54
TM involvement	3.80	.50	36	3.23	.64	18	3.61	.61	54
Successful :									
TM support	4.09	.19	4	3.95	.44	8	4.00	.37	12
TM commitment	4.15	.30	4	3.95	.41	8	4.02	.38	12
TM involvement	4.15	.44	4	3.95	.49	8	4.02	.46	12

Note) A 5-point Likert scale ranged from 0 = strongly disagree to 5 = strongly agree; TM = Top Management; SOE = State-Owned Enterprise; SD = Standard Deviation.

ERP implementation was not-yet-successful or still in progress. Only 8% respondents claimed it was successful. On the other hand, no respondent in SOE 2 perceived ERP implementation as unsuccessful. Most of them perceived ERP implementation were still in progress (69%), while 31% perceived successful.

To answer the research question, this study used multinomial logistic regression because it can analyze the relationships between multiple independent variables and multi-category dependent variable. In this study, the independent variables were the dimensions of top management roles (top management support, top management involvement, and top management commitment); while the multi-category dependent variable was ERP implementation success which had three categories : successful, not-yet-successful, and unsuccessful.

Based on model fitting information in <Table 5>, this study's model was significant and could be further be analysed. Therefore, <Table 6> showed that the only factor influencing significantly ERP implementation to be successful,

〈Table 5〉 Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	119.313			
Final	93.442	25.871	6	.000

〈Table 6〉 Parameter Estimates

ERP Implementation[a]	B	Std. Error	Wald	df	Sig.
Unsuccessful :					
Intercept	11.108	4.041	7.554	1	.006
TM Support	.576	1.756	.108	1	.743
TM Commitment	-5.044	1.681	8.998	1	.003
TM Involvement	1.213	1.281	.896	1	.344
Not-Yet-Successful :					
Intercept	8.423	3.176	7.035	1	.008
TM Support	1.592	1.498	1.130	1	.288
TM Commitment	-3.208	1.346	5.682	1	.017
TM Involvement	-.276	.973	.080	1	.777

Note) [a]: The reference category is : Successful ERP Implementation; TM = top management.

not-yet-successful, or unsuccessful, was top management commitment. In another words, with no top management commitment, ERP implementation would be unsuccessful or not-yet-successful.

4.1 Discussion

Before discussing the results, it is better to review the important roles top management should do to have successful ERP implementation. In order to be successful, the ERP project must be aligned with strategic business goals, whether the business process is job order or repetitive in nature. Therefore, top management is required to participate in the team meeting together with steering committee to define how ERP system should be integrated into the overall company operations.

Members at various levels of the hierarchy, both at top and middle management, need to be involved throughout the ERP project [Jarrar et al., 2000; Nah et al., 2001]. This involvement is critical because ERP implementation would cause radical changes in work habits and procedures which need great organizational alignment [Rao, 2000]. In this situation, majority of organizational members, including middle management, may be fearful of changes because the entire structure of the company is turned upside down. Some of them may be afraid that ERP system would make their jobs more difficult, reduce their importance, or lose their jobs. Some others might be uncomfortable because with better information, top management can keep track of what they are doing.

To minimize resistance to change, it is important to get key-users involved during the development of the system and to make use of their knowledge in areas where the team lacks expertise [Francoise et al., 2009]. Key-user involvement and participation will result in a better fit and acceptance [Esteves-Sousa and Pastor-Collado, 2000]. Moreover, top management needs to communicate changes in business process implementation to the ERP users [Amoako-Gyampah, 2004] and to all levels, although employees are not directly connected with ERP implementation.

In addition, user training should be emphasized, with heavy investment in training on functional and system processes and re-skilling of developers in software design and methodology [Sumner, 1999]. This should be taken seriously because education and training are frequently underestimated by top management and are given less time due to schedule pressures [Sumner, 1999]. If the employees do not get sufficient education of ERP implementation, including the system, the possible changes, the conflicts and the results, and all the related issues, it will lead to a negative attitude to the ERP system to the potential changes or conflicts during the implementation [Sheu et al., 2004]. All users must be trained to take full advantages of the system's capabilities. A failure to educate and train all relevant personnel will guarantee implementation problems [Srivastava, 2010].

Top management should conduct periodic meetings with the project team to revise the project plan, if necessary, double-check performance measures, and track carefully any de-

viations [Sawah et al., 2008]. Top management should also monitor the implementation effort, spend time with people and provide clear directions of the project [Zhang, 2002], and make them accountable for the achievement of organizational goals [Francoise et al., 2009]. Top management can control the implementation by linking key control systems, performance measures and incentives to strategic priorities [Buckhout et al., 1999].

ERP implementation is a continuing improvement process; hence top management should get coordination and cooperation from various departments during the implementation process. Top management should continue to participate and communicate with employees to identify the difficulties and the misusing problems that employees may have encountered while using the ERP system and help resolve the problems in time [Zhen Shao, 2009]. Moreover, they can find out the negative attitude towards the ERP system in time and provide enough support to them both technologically and mentally, which is beneficial to reduce employees' resistance towards ERP system [Bandura, 1999].

By participating in ERP implementation, top management can also coordinate potential conflicts among individuals arising from the distribution of tasks [Zhen Shao et al., 2009] or among lower levels of management from disagreeing on priorities. Moreover, top management can take part in resolving any conflicts that may arise from inconsistent decision-making which lead to contradictory communication of goals, requirements, or plans [Jarrar et al., 2000; Zarotsky et al., 2006].

This study shows that top management commitment is perceived to be the most critical factor in ERP implementation success among the 84 respondents working in two Indonesian SOEs. With lack of top management commitment, ERP implementation would not be successful, meaning, the implementation could not be completed within the budget or did not turn out to be well matched with the company's needs.

In SOE 1, for example, there was lack of clear integrated blueprint business process during planning phase. Taking into consideration that SOE 1 had job order production process, which was more complex than repetitive production process, business process should be discussed intensively and should be integrated among departments. SOE 1 seemed just to automate each department business process, and nobody acted as an integrator who should make alignment between business process and company's strategies.

Furthermore, the would-be key users were chosen not because of their expertise on business process in their departments, but because they had spare time. Hence, several times, key-users were not the same persons since the previous ones were busy or had been transferred to other department. Thus, they were not the competent persons to be part of the development of the company's blueprint.

In SOE 1, almost 90 percent of the respondents aged between 35~54 years, while their direct superiors were 45~54 years old. Most of them were key-users and end-users who had no experience with ERP system. Meaning, they

had very low IT awareness and capability during the implementation.

During ERP implementation process, they felt top and middle management had lack of commitment to consider ERP system as high priority and be enthusiastic about the success of ERP system. This was reflected on the low mean score perceived by the respondents who felt ERP implementation was unsuccessful. For example, they were inconsistent in controlling end-users to input real time data, lack of team spirit among departments during the implementation period, and unresponsive to end-users' queries. This condition showed as if they were not ready to change from the traditional to ERP system. Therefore, for them ERP system was not seen as an effective tool, but more as a burden.

Moreover, they also perceived ERP system was not well socialized to end-users. Periodic meeting to discuss any hindrance, unfamiliarity with the systems, etc. were seldom conducted. No specific ERP project team was assigned to coordinate and monitor the implementation process and respond to key-and end-users' quiries. Thus, during implementation they did not know whom to ask when facing problems. When clarified, middle management believed that monitoring should be done by vendor. Middle management also felt that vendor was not equipped with broad knowledge of job order business process in SOE 1.

This condition might be due to the fact that in SOE 1, middle management from various departments were not involved intensely during the planning phase, thus, resulting lack of coordination and cooperation among departments. Middle management was not acting as agents of change within the department, for example to control users to be disciplined in data entry.

ERP training program was perceived to be insufficient. With the condition of low IT capability among employees, especially key-users, it was hard to understand ERP system in a short period training program.

Low IT awareness and capability and lack of knowledge on the integrated business process of printing company with job order production process had resulted many important things had not been accommodated by the ERP systems. Thus, most of the respondents (69%) perceived the implementation of ERP systems was not-yet-successful, while 23% perceived unsuccessful. These conditions in SOE 1 contributed to a lack of use of the ERP system, poor quality of data entered into the system, slow response when users have trouble entering data, and invalidated report.

With minimum effort in change management process and lenient performance measurement; there was only slight change in employees' working habits after ERP implementation in SOE 1. Thus, SOE 1 was not yet able to control day-to-day operations based on real-time information or optimize business process.

In SOE 2, although the business was large scale and the refineries were located in different cities around Indonesia, the production process was considered as repetitive process. The person-in-charge of ERP project in SOE 2 had deep knowledge on the business process from upstream to downstream production.

The respondents from SOE 2 showed apparently positive attitudes to the ERP system compared with SOE 1 because there was no respondent perceived ERP implementation as unsuccessful. In SOE 2, everytime problems existed, the ERP project team would try finding the best solutions to improve the system. For example, in order to avoid misused of payment process, SOE 2 developed centralized-flow-of-money.

Respondents' written comments were part of constructive feedbacks from all users. Some of their comments were top and middle management lacked in giving clear direction, inconsistent in implementing ERP, no strict control on end-users' data entry, and lack of coordination between working units.

Based on constructive feedbacks from different level of users, SOE 2 not only did continuous improvement, but also created "dashboard" to measure performance of each department, SBUs, etc. These key performance indicators (KPIs) were then monitored periodically, including by top management. Although at the beginning it was not 100% accurate, but users were aware that if they had poor performance, they should have reasonable clarification to be explained to top management. Therefore, problems related to ERP system in each department could be settled step-by-step.

In SOE 2, respondents had various kinds of roles, such as key-users, end-users, administrative support, project team member, and project coordinator. Although several respondents had no experience in ERP implementation, but with direct superiors who had experience in ERP system mostly more than five years, they did not have many difficulties when facing with trouble or backlog.

Since its upgrading phase into MySAP on January 2008, SOE 2 was able to create disciplined-working culture. SOE 2 needed one year to change employees' attitudes to be disciplined, with the help of several tools, i.e., KPIs and informal monitoring by top management. Thus, SOE 2 was able to manage its transactional data on a continuous and real-time basis, not only within a single location but also across multiple facilities and business units by the end of October 2010.

Since ERP implementation is a continuing improvement process, it is obvious that successful ERP system implementation depends on the degree of top management commitment. Top management commitment is perceived as the most critical factor for ERP implementation success both in SOE 1 and 2, compared to top management support and involvement. This result is in relation with the studies of Bingi et al. [Bingi et al., 1999], who claimed that the success of ERP implementation completely hinges on the strong, sustained commitment of top management, because this commitment when percolates down through the organizational levels results in an overall organizational commitment.

Moreover, the sustained management commitment should include both top and middle levels of management. If top management is not strongly committed to the system, does not foresee and plan for the profound changes necessitated by ERP, does not actively participate

in the implementation, the implementation has a high likelihood of failure [Srivastava, 2010].

4.2 Conclusion

The results of this research provide implications that top management commitment is the most important factor in enhancing the overall ERP implementation success, compared to top management support and top management involvement. Therefore, top management and middle management must continually show commitment during the process and pay attention to all the affected departments in the organization.

Specifically, top management should be committed to give much attention to change management process, provide training and education to ensure sufficient knowledge and expertise about ERP system, get coordination and cooperation from various departments during the process in order to get interdepartmental collaboration, take part in resolving any misunderstandings among lower levels of the organizational members, and monitor the progress of ERP implementation to make sure everybody is accountable for the achievement of organizational goals.

Although previous studies claimed that there were several CSFs for ERP implementation success, such as having aligned business process, personnel resources, formation of a balanced project team, suitability of software and hardware, business process reengineering, sufficient training and education, interdepartmental communication and collaboration, but if top management does not show commitment to control and monitor the process, ERP implementation will turn out to be a failure. Therefore, this research is useful for top management and practitioners in both SOEs to understand when they undertake ERP projects in the future.

Future studies will futher advance this effort with slight modifications. A large data sample should be sought. In the future, the viewpoints of top management, middle management, project leaders, key-users, and end-users should be solicited in a balance numbers.

This paper has limitation because only two SOEs were included in this research. However, this research would be strengthened further if additional SOEs are used.

In view of the four constructs used in the research framework, a sample size of 84 is statistically sufficient for analysis, however, for the purpose of multi-group analysis, a larger sample size might have been more useful to generalize the findings in SOEs.

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