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Internal Organizational Factors Influencing Sustainable Implementation of Information Systems: Experiences from a Local Government in Indonesia

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Abstract

Many information systems (IS) studies have found that information systems implementation sustainability is determined by internal organizational factors. In general these studies have been conducted in private organizations and these factors may not be applicable to IS implementations sustainability within public organizations. This study examines what internal organizational factors play a role in the sustainable implementation of e-government initiatives using a case study of local e-government in Indonesia. It also considers how these factors contribute to sustainable systems by strengthening stakeholders' commitment through invoking feelings of involvement as responsibilities are assigned to them. The study concludes that the internal factors contribute to collective action that influences sustainable implementation of information systems. Limitations and future research are briefly discussed.

Key words:

Organizational factors, IS sustainability, local government, e-government, Indonesia

INTRODUCTION

Organizations' implementation of IS may be driven by the benefits they hope to obtain from it, such as strategic, informational, and transactional (Mirani & Lederer, 1998). Strategic benefits may relate to organizational management performance, such as organizational units integration (Goodhue, Wybo, & Kirsch, 1992), and informational benefits may relate to efficiencies in regard to information processing and management, such as timely access to information (Yusuf, Gunasekaran, & Abthorpe, 2004). Meanwhile transactional benefits may relate to efficiency and effectiveness in transaction performance, such as business automation, to ease services delivery and cost reduction (Goodhue et al., 1992; Hamilton & Chervany, 1981).

Organizations obtain these benefits when IS is able to facilitate organizations' performance in both short and long term periods (Ketinger, et al, 1994. p.32). In facilitating long term support for organizations, IS should be sustainable in terms of ongoing running over time (Braa, Monteiro, & Sahay, 2004) following the implementation stage. In this study, IS implementation sustainability is defined as "*the technology that is capable of being maintained over a long period of time*" (Misund & Hioberg, 2003). We argue that sustainability in IS might be achieved if the systems are able to be operated and utilized within organizations for the whole of their life cycle. By utililization we mean that the IT is settled and accepted as a daily phenomenon that is institutionalized and routinized within the organization's life (Avgerou, 2000; Cooper & Zmud, 1990). As a result, the organization and its people are more likely to put effort into sustaining the IS implementation when the IT is taken for granted.

Internal organizational factors are defined as "*those variables that affect the organizational structure that the organization could adjust or change to suit its changing environment*" (Teo, Tan, & Buk, 1997, p. 96). Seminal studies on IS implementation sustainability (e.g: Kumar & Van Dissel, 1996; Zhang, Lee, Zhang, & Banerjee, 2003) argue that internal organizational factors that influence the sustainability may include sustainability of leadership and coordination amongst an organization's actors. Other studies (e.g: Chatterjee, Grewal, & Sambamurthy, 2002; Nah & Delgado, 2006; Sabherwal, Sein, & Marakas, 2003; Zhang et al., 2003) have also found that IS implementation is influenced by other internal organizational factors such as diversity of coordination and cooperation, sharing responsibility, and organizational members' and group commitment towards IS implementation.

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However, these studies have been mainly carried out within private organizations and the findings might not be applicable to public sector organizations as a "*more frequent turnover of top leaders due to election and political appointments results in greater disruption of implementation of plans*" (Frederickson, Rainey, Backoff, & Levine, 1976, p. 237). In addition, public organizations are also more bureaucratic, exhibiting less flexibility in management and tasks performance (Frederickson et al., 1976). As a result, organizational factors that sustain IS implementation within the private sector may not be applicable to IS implementations within the public sector and there is a lack of understanding of how public organizations are able to sustain their IS implementations.

Motivated by this lack of understanding of internal organizational factors that influence IS implementation sustainability, this research aims to provide perspectives on how a local government is able to implement a sustainable IS within its organization. Our study focuses on identifying what internal organizational factors affect the sustainability of an IS implementation within a local government in Indonesia and how these factors affect the outcome of the implementation. The outcomes of this study allow for a greater awareness of organizational factors and their impact on IS implementation sustainability within government organizations. To address these issues, this study will answer the following research questions: ***What are the internal organizational factors that sustain information system implementation within a public organization and how do they affect sustainability?***

The structure of this paper is as follows, the next section presents a theoretical review of IS implementation sustainability and internal organizational factors. The research methodology is presented in section 4, while section 5 describes case context. Findings of this research are then presented followed by the discussion and conclusions. Limitations and future research are discussed in the final section.

IS IMPLEMENTATION SUSTAINABILITY

Some IS studies (e.g: Pinto & Covin, 1989) argue that the early implementation stage is important in an IS implementation cycle because it determines the future use of the system. However, other studies, such as Waal (2003) who divides IS implementation stages into starting, development, and use (post implementation), argue that the use stage (post implementation) is the most important stage because the information system affects the organizational performance management into the future. This means maintaining IS at the post implementation stage is crucial to an organization's ability to support their performance through the life cycle of the system. We refer to this condition as IS implementation sustainability.

The basic concept of sustainability is preservation. Luftman & Brier (1999) argue that sustainability is the ability to preserve a technology over a long period. Another study (e.g: Laws et al., 2002) specifically refers to sustainability as the maintenance of the technology. However, the basic concept of sustainability is not only preservation or maintenance, but also improving a condition for an unlimited time in the future (Pezzey, 1992). In this context, Braa, Monteiro, & Sahay (2004) address IS implementation sustainability as an activity of making information systems work over time within an organizational setting. If a technology is successfully implemented and used but is unable to endure for future utility, it is not considered as sustainable because it has not been in continuous operation (Krishna & Walsham, 2005). This in line with the concepts of maintenance post-implementation of an IS, which also includes activities such as evaluation, system improvement, and human skills improvement (Markus & Tanis, 2000).

Sustaining an IS implementation may require critical internal organizational support to maintain the system to ensure it is regularly used and to enable routinization within the organization. Authors argue that the post-implementation stage is the more important stage to be considered within a government organizational context. For example, Heeks (2003) has found that even where IS are successfully implemented in a government initiative, these IS often cannot be sustained. Braa et al. (2004) also argue that the most important aspect of IS implementation is to make it work and for it to be used over time in an organizational setting after it is implemented. This means more organizational effort is required during the post-implementation stage to make the IS sustainable over a long period of an organizational lifecycle. This includes continuous support from all participating actors as found by Braa et al. (2004).

Research into IS implementation, which has been carried out by well-known IS scholars (e.g: Akkermans & van Helden, 2002; Galliers, 1991; Ginzberg, 1980; Holland & Light, 1999; Markus & Tanis, 2000; Nah & Delgado, 2006; Nah & Lau, 2001; Newman & Sabherwal, 1996; Raymond, 1985), has found that internal organizational factors play an important role. However, these findings might not necessarily apply to e-government due to frequent leadership and organizational changes in a government context (Frederickson et al., 1976). In the private sector IS implementation requires extensive effort over long time periods (Lucas Jr & Baroudi, 1994) to ensure ongoing use. To summarise, IS implementation is not finished when a system is implemented because it still requires evaluation, development, and maintenance of the system and of stakeholder skills. This study extends the focus on internal organizational factors that may lead to sustainable IS post-implementation to an e-government context to identify the factors that are applicable in this environment.

ORGANIZATIONAL FACTORS

An organization can be viewed from a collective action perspective that "*emphasizes collective survival, which is achieved through collaboration*" (Astley & Van De Ven, 1983, p. 251). This view is strengthened by the assumption that organizations are cooperative systems which allow them to reach decisions, take actions, and make adjustments in achieving their goals (Selznick, 1948). In contrast, other studies view organizations as machines which are controlled by strong rules and bureaucracy in achieving goals (Wallach, 1983). Our study takes the former view that organizations are an active entity and does not accept the latter argument. This position is in line with Perrow's (1973) view in which he argues that the study of organizations should have an emphasis on human relation within the organization rather than studying organizations as machines.

Internal organizational influences on IT implementation have received good recognition in previous studies (e.g: Ash, 1997; Davis, 2000; Loh, 1992). These studies note that internal institutional factors play a strong role in IT implementation particularly in diffusing innovation and spreading the usage across the entire internal organization. These internal organization factors have been considered more important in comparison to external factors in previous IS/IT studies (e.g: Hu, Hart, & Cooke, 2007) because they contribute to determining organizational ability to sustain the IS. Internal organizational factors that affect IS implementation that are commonly found in the seminal literature include flexibility in coordination mechanisms (Allen, 2001; Chatterjee et al., 2002; Ginzberg, 1980; Malone & Crowston, 1990; Sharma & Yetton, 2003; Zhang et al., 2003), cooperation with multiple actors (Kumar & Van Dissel, 1996; Zhang et al., 2003), sharing of responsibility (Nah & Delgado, 2006; Nah & Lau, 2001; Rosario, 2000), and organizational members' commitment (Akkermans & van Helden, 2002; Henri Barki & Hartwick, 1994; Sabherwal et al., 2003). These internal organizational factors support this study's view on organizations as a cooperative and collective action entity that allows for human relation flexibility. The key feature of internal organizational factors are extracted and given in Table 1.

Table 1. Organizational Factors

No	Organizational factors	Authors
1	**Coordination**: differentiation in coordination mechanisms including new vertical and horizontal coordination mechanisms, through formal and informal means, to improve actors' task performance. High level organization support through flexible coordination is required and relationship among actors is also managed to ensure lower level workers commit their maximum effort to the innovation implementation.	(Allen, 2001; Chatterjee et al., 2002; Ginzberg, 1980; Malone & Crowston, 1990; Sharma & Yetton, 2003; Somers & Nelson, 2001)
2.	**Cooperation**: sustainable cooperation between internal actors and inter-organizational departments to perform work in a collaborative context, which might reduce cost, spread risk, and improve access to complementary resources. Participants are encouraged to be cooperative rather than competitive to harmonize job completion across the organizational structure.	(Ginzberg, 1980; K. Kumar & Van Dissel, 1996; Zhang et al., 2003)
3.	**Responsibility distribution**: organizational members and groups should be assigned equal tasks and responsibility in managing project implementation. This includes determining clear tasks and responsibilities to ensure actors work on the right assigned tasks. Power should also be distributed equally.	(Ginzberg, 1980; Nah & Delgado, 2006; Nah & Lau, 2001; Rosario, 2000)
4.	**Commitment**: is a psychological state that holds people and organizations to a line of behaviour toward IS implementation which requires commitment from all participants to succeed. Organizational participants' commitment is established by involving them in the implementation process through assigning tasks, flexible coordination and cooperation.	(Akkermans & van Helden, 2002; H Barki & Hartwick, 1989; Henri Barki & Hartwick, 1994; Premkumar & Ramamurthy, 1995; Sabherwal et al., 2003)

METHODOLOGY

The case study research method was chosen to study a local e-government systems implementation in Indonesia. A case study research method is well suited to understanding phenomenon when the boundary between the phenomenon and context are not clearly defined and requires an in-depth study (Yin, 1981). E-government

implementation is a complex phenomenon due to the many institutions involved. The complexity emerges as result of institutions' interaction, across social, political, and cultural contexts during implementation, and this complexity can be better understood through interpretive case study research (Stockdale & Standing, 2006; Walsham, 1995, 2006).

The case study selected is Jembrana, a local government in the Bali province of Indonesia with the unit analysis as the Department of Transportation, Communication and Information (DEPHUBKOMINFO). It is a department which is responsible for IT implementation within the local government. Primary data were gathered through semi-structured interviews, which lasted between 45 minutes to one hour. All transcriptions were sent back to the participants for final confirmation of content and meaning. There were 12 participants from management level through to technical employees. The twelve participants comprised of 4 management level staff, 4 IT/IS team members, and 4 IT/IS operational staff who are also users at different departments. Data collection from different levels of an organization hierarchy will contribute to drawing more informed conclusions from this study (Scheepers & Scheepers, 2003). The field visit was carried out from early March to the end of June 2011, but several contacts, such as emails and phone calls, were made until February 2012 to gain additional data. During field visits, field notes were made and written materials that support the main data were also collected.

The coding of data broadly followed the method outlined by Strauss and Corbin (1990) in that the data analysis was carried out through iterations; open coding, axial coding and selective coding. In the first iteration, we coded into a broad range of categories based on the research question and the concepts (Table1). In the next iteration, axial coding was carried out by making connections between categories and codes (Corbin and Strauss, 1990). In this stage, categories from the open coding were refined to a smaller number to identify the existence of organizational factors in the data and also to find new categories from the open coding. In the third iteration, selective coding (Corbin & Strauss, 1990) assisted us with in-depth examination of the second stage categories by "*refining their meanings, and articulating relationships among them*" (Jin & Robey, 2008, p. 183) to enable theoretical categories that informed the findings of the research and contributed to outcomes which resulted in establishing our theoretical perspectives.

Case Description

Electronic government in Indonesia was initiated in 2001 when the government enacted Presidential Instruction No. 6/2001 outlining a five-year National Information and Communications and Technology (ICT) Action Plan. The plan states that information communication technology should be used to empower citizens, increase their welfare, reduce poverty, and eliminate the digital divide. E-government in Indonesia was formally adopted with the enactment of Presidential Instruction No.3/2003 that addressed the National Policy and Strategy of e-government implementation. Since then, many local governments have implemented e-government systems. Jembrana (a local government in Bali province) has been successfully implementing e-government systems since 2001 to enhance their performance in providing services to citizens. The local government has twice received awards owing to their success in e-government implementation and their ability to utilize IS to reform their organizational performance and services. They were also awarded the 'best local government e-voting system', an initiative developed and implemented by their IT staff. Jembrana's ability to sustain e-government systems has attracted interest from more than 400 other local governments and institutions that wish to learn and do comparative studies (Winasa, 2009). The first implementation of an e-government system arose from the local leader working in cooperation with a central government body BPPT (BPPT stands for Technological Research and Implementation Bureau. It is a body under the Ministry of Research and Technology). Since 2001, Jembrana has implemented about 34 e-government systems (Suinaya, 2010).

FINDINGS

The findings are presented in the themes derived from the analysis and linked to the factors presented in Table 1.

Synergizing Through Coordination and Cooperation

Coordination and cooperation were major internal institutional issues and were raised by several participants during the interviews. Coordination and cooperation regarding e-government systems implementation within this local government is practiced from the lowest level to the highest level of the government institutions, as well as with external local government institutions, such as with other local regencies and private companies. Vertical coordination and cooperation with central government began with support to increase Jembrana's IT staff . This in turn supported initiatives such as the implementation of a demographic administration information system (SIAK) and a local government financial information system (SIADENDA). Central government has also worked in cooperation with Jembrana in assisting with systems maintenance. Coordination and cooperation with central government started when the early e-government information systems, such as KANTAYA (a virtual office system), were implemented. The local government office started to coordinate and cooperate with the

Ministry of Research and Technology (MENRISTEK) through its BPPT (Agency for Technology Studies and Implementation) in designing the e-government implementation in 2001. The increase in IT staff, assisted by BPPT, that supported the early e-government initiatives, also gave the foundation for Jembrana to develop a human resources system. This system has resulted in greater efficiencies in training and recruitment and currently Jembrana has recruited 78 IT staff, all of whom are graduates with an IT background.

> *Cooperation with BPPT includes training of human resources, program design and application building..... Now we have got about 78 staff who have formal education background in IT. Those human resources have supported the implementation of e-government systems within our local government* (Participant A)

The coordination and cooperation between the local government employees and central government was practiced to sustain the operation of the central government transferred systems. For example, SIAK (demographic information system), which was transferred by the Ministry of Internal State Affairs, has prompted Jembrana's Department of Civilisation and Civil Services to coordinate and cooperate with the Ministry office regarding implementation and maintenance as stated by the following participant:

> *Department of Internal State Affairs takes care of the server and coordinate directly to the central office in Jakarta (Ministry of Internal State Affairs), not from the IT division. But if something happens, they do coordinate with us to discuss what exactly happens to the server then report to Jakarta* (Participant E)

Other than vertical coordination and cooperation, the local government also coordinates and cooperates with other local governments within Bali province and between local government departments. For example, the implementation of an e-ID (electronic identification) system across Bali province required coordination among the local governments:

> *We also did a lot of coordination and consultation in Bali such as with Denpasar city regarding e-ID card implementation.* (Participant A)

Inter-local government departmental coordination and cooperation has also significantly played a role in e-government implementations. The coordination was regularly practiced in formal and informal contexts. Regarding formal coordination, the IT team had scheduled monthly meetings with all IT staff within the local government central office, district offices, and villages. This regular coordination was aimed at finding solutions regarding problems encountered during e-government systems implementation and ongoing use.

> *Each month we hold a regular meeting where we discuss our problems encountered during tasks completion. We also discuss what applications should be implemented and how to improve current applications …… in the meeting we also get input from our friends who work at district level because they are directly confronted with the villagers and they know what should be improved* (Participant I).

Coordination and cooperation with district IT staff is also crucial for the systems and hardware maintenance at village levels. They can take quick action by contacting the IT team at Jembrana central office if they cannot handle the problem and then the IT team at the office will response to their enquiries.

Sharing Responsibility to Reduce the Burden

The implementation of e-government systems within Jembrana local government requires the local leader to mobilize a range of resources such as financial, infrastructure, and human resources to support the implementation. This causes Jembrana to develop innovative strategies to reduce the burden by distributing it across the institutions within the local government. Action was first taken by the Department of Transportation, Communication, and Information by forming an IT team to bear the responsibility regarding human skills and task completion. Since 2010 the IT team has been divided into five divisions: Planning, Implementation, Development, Services, and Evaluation to handle specific jobs regarding e-government implementation. Each individual within each division has also been assigned clear responsibilities and tasks.

> *The main duties have been distributed to each division. You can see all IT staff have their own specific tasks written on the list and attached on their table. So, every day they know what to do, such as to handle tasks regarding ID cards, e-voting, and also* SIAK. (Participant E)

The local government network infrastructure that supports e-government systems implementation was successfully built through a collaborative financial scheme where each institution such as districts, villages, and schools took some responsibility for the funding needed. The network infrastructure, J-Net (Jimbarwana Network), integrates Jembrana central office, districts, villages, schools, hospitals, and other institutions in a network. Participant A explained:

> *The J-Net was funded by local government and supported by districts, villages and schools. They took responsibility for the J-Net budget implementation voluntarily. For example each district donated 60 million, villages 40 million, and schools 30 million* (1 million rupiah is equal to US $1100).

The availability of J-Net which connects 228 institutions, 5 districts, 51 villages, and 130 schools, telecentres, hospitals and health centres, and local government departmental offices, had supported systems implementation

such as KANTAYA, e-JKJ (Jembrana electronic health system), and J-ID (Jembrana identification). The network was supported by wireless transmission towers across districts and villages. Even though the main task responsibility of e-government implementation was on the Department of Transportation, Communication, and Information, together with the IT team, the whole task responsibilities of the implementation process had been distributed across institutions. The extension of responsibility was aimed to share the burden among them such as financial, hardware, and human resources. The Department of Transportation, Communication, and Information had a limited budget to support all e-government systems implementation and maintenance within local government. Since each department had autonomy to plan and use the budget for their own purposes, the Department and the IT team wanted them to take responsibility for the implementation and maintenance process. Participant J explained:

> If the maintenance is carried out within the SKPDs (the local government department), the cost is the responsibility of each SKPD. If the maintenance is in districts, schools and villages, they will be responsible for the cost too. We do not have a budget for that.

The IT team strongly encourages other departments to take responsibility of all e-government systems implementation. For example, when a department wants to replace certain computer hardware within their office but the IT team does not have the hardware, a participant explains:

> Of course we have to wait for the hardware from the SKPD. They must buy the devices. If we need the devices we have to wait for the hardware from them. It's their responsible to provide the hardware. (Participant J)

As a consequence of responsibility sharing, each department is encouraged to allocate their own budget annually for IT maintenance purposes. The responsibility of e-government systems implementation has also extended to district levels, where some IT staff have been assigned to work.

> If the problem occurs in a district and village, there's an IT staff who takes care of the problem in that area….they are the staff from this office but appointed there (Participant E)

Bearing maintenance cost responsibility in all institutions had become a solution for the IT team in reducing the burden related to lack of annual costs within the Department of Transport, Communication and Information. This strategy had helped them maintain the continual operation of the systems across Jembrana.

Commitment is strengthened and rewarded

Jembrana's leader and employee commitment regarding e-government implementation had been considered an important element that supports the e-government. Their commitment had been shown in a number of actions. First, the local government political leader (the Regent) issued a local regulation (Regent Instruction No. 3 year 2006) to strengthen e-government implementation within the local government institutions. Second, reward and punishment mechanisms were applied to ensure all institutions and employees work hard to support e-government implementation. Regarding reward, Jembrana holds yearly competitions to find the best department that updates their website regularly and provides quick responses to citizens' enquiries. This strategy was aimed to motivate all departments to regularly upload information on their websites and take active action in responding to citizens online enquiries. Meanwhile, incentives for IT staff were also a strategy to motivate them to work hard and comply with the jobs assigned to them.

> My IT colleagues sometimes also feel exhausted during the day, especially when they do the job outside of this office such as in districts. Of course they have got salary but that is not enough, for that we give more rewards. They often work from morning until late evening and they are exhausted, so we give them extra money for lunch and provide them with extra incentives (Participant A).

However, punishment is also exerted to ensure all institutions within the local government pay serious attention with the process of e-government implementation and use it within their daily work. A participant described how the Regent threatens department leaders during every meeting.

> He really paid serious attention to that issue because he has stated in every meeting that all SKPDs must use technology to serve citizens. That is one way to ensure efficiency in our local government,…our leader threatens to cut the budget of a SKPD if they do not use IT that we have provided for them (Participant C)

At departmental level, punishment is also used to ensure support of e-government implementation

> We motivate them (employees in all departments) to use the systems in different ways. First we motivate them persuasively. I persuade them to use IT by telling them the benefit of using the IT. If they still do not utilize the IT, then we send an official letter from the Regent (mayor) or Regional Secretary that ask them to use IT in their jobs. If the notice still does not work, then, we do the most extreme thing by sanctioning a "naughty" SKPD; we disconnect their Internet from the server in this office (Participant B).

A notice letter is often written by the Department of Transport, Communications and Information, which is endorsed and signed by the Regent before the IT team send it to a relevant department. The IT staff also often punishes other department staff to encourage them to utilize the systems in their work places:

> *If they do not use the systems properly we will not respond to their complaints quickly, for example when they want us to fix their computers. I think that is a good way to force them to cooperate and use the systems (participant C).*

The IT team commitment to support all e-government systems implementation is not only exerted within Jembrana central office departments but also to district and village levels. If the IT staff at village levels cannot manage IT problem in their areas, the central office IT team will visit to support them. All districts and villages are required to update their data regularly for using in e-government systems such as SIAK and e-JKJ. The Department and the IT team mandate their staff at district levels to work properly to support the systems. A decision maker says:

> *We also threaten staff who work in the districts if they forget their duties to update the existing information such as on poor birth and death population data. If they fail to do their job, their salaries will be stopped until they update the information or send us the data via the network (*Participant B)

Strong commitment expressed by Jembrana leaders and employees across institutions appears to arise from the responsibilities assigned to them. They work hard to achieve their own goals and succeed in each given task by coordinating and cooperating amongst themselves and with other relevant actors. The feeling of involvement with the given responsibilities may also cause them to work hard and find strategic solutions to successfully accomplish their tasks such as providing rewards and punishment to enhance commitment to the e-government project.

DISCUSSION

The findings show that coordination and cooperation mechanisms in the local e-government systems implementation have been practiced vertically, such as with central government departments, and horizontally, such as between departments, other regencies, and private agencies. Jembrana's ability to practice a variety of coordination mechanisms (e.g: Chatterjee et al., 2002) has helped local government to more effectively manage their e-government systems post implementation because they are able to perform cooperative activities with multiple agencies to sustain the operation and use of the systems.

The impact of diversity in coordination and cooperation is the opportunity to share responsibilities and burdens among institutions within the local government. Chatterejee, et al., (2002) use the term "sharing of risks" in addressing the positive impact (which also includes promoting collaboration and partnership) of coordination mechanism diversity within organizations. In our study context, we view the "responsibilities and burden" of e-government implementation on the Department of Transport, Communication and Information and the IT team as "risks". For example, there is a risk in the J-NET infrastructure not remaining operational because the high cost of the infrastructure requires hardware provision and maintenance across the local government. However, when the responsibility of the cost is shared between Jembrana central office departments, districts, villages, schools, hospitals, and other institutions, the J-NET infrastructure was successfully built and maintained for the local government use. Similarly, maintaining e-government systems and infrastructure is a huge burden for the IT team because of the lack in the Department of Transport, Communication and Information's budget. However, the burden is also shared with other institutions to keep the systems operating. Each institution is required to allocate budget to maintain the systems and infrastructure within their organizations. IT personnel, skills, and knowledge were also distributed across departments, districts, and other institutions to support the implementation and maintenance. As a result, the institutions reliance on the Department and the IT team can be reduced.

We argue this type of shared responsibility is a "collective action" (Knoke, 1988) from all actors within Jembrana to provide resources. Knoke (1988) argues that a collective action within an organization can help the organization's members achieve their objectives more easily. Similarly, the shared responsibilities or collective action of all institutions concerned has enabled Jembrana to successfully build J-NET to connect all local institutions in an online network and implement many e-government systems that enable communities and government employees to access online services. Responsibility sharing has also been address by McDaniel (2003) as a factor that supports an e-government project to achieve its objective and sustainability.

Previous studies in IS (Akkermans & van Helden, 2002; Liang, Saraf, Hu, & Xue, 2007; Zhang et al., 2003) and e-government (Farholt & Wahid, 2008; Gupta & Jana, 2003) argue that successful IS implementation is strongly determined by a project champion and strong leadership but this study argues that the sustainability of IS implementation within public organizations is not only determined by a project champion, but also by collective responsibility and commitment among all government actors which are built through diversity of coordination

and cooperation mechanism, and sharing responsibilities. The authors also argue that reliance on strong leadership and a project champion might not sustain IS implementation because most (may be all) public organization leaders are political and their leadership is terminated after a certain period such as four or five years. For example, a telekiosks project implementation in India failed to be sustained when the local leader was no longer in charge (R. Kumar & Best, 2006). This means the continuity of a public IS project is uncertain because it depends on each leader's strong or weak commitment. However, if a government IS project is implemented based on collective action and responsibility of all actors and institutions within a government organization, the sustainability of the project implementation might be achieved. In other words, collective action which is established through flexible coordination, cooperation and sharing responsibility may be more important rather than simply strong leadership or top leader commitment.

CONCLUSION

This research has identified the internal organization factors that have significantly influenced Jembrana's ability to implement and sustain e-government systems. The ability of the local government to practice diversity of coordination and cooperation mechanisms and to share responsibility among internal institutions helps the local government to maintain their IS. Leaders and employees become more committed when the local government views the e-government project implementation as a collective action between them. Organizational members' commitment is not only established through their involvement in the systems implementation but also strengthened through rewards and punishment mechanisms. Although previous IS studies found that project champions play a significant role in IS implementation sustainability, this study concludes that the finding might not necessarily be applicable to public organizations which their leaders are often terminated due to the nature of political systems. We argue that diversity of coordination and cooperation as well as sharing responsibility across organizational members and groups might sustain IS post-implementation. This results from stakeholders' commitment toward the IS implementation that is enhanced due to their involvement through coordination and cooperation, and responsibility assigning.

LIMITATION AND FUTURE RESEARCH

This study was carried out within a local government in Indonesia and the findings may provide a new perspective on internal organizational factors influencing IS implementation within public organizations, particularly in developing countries. Since this study was carried out in one public organization (local government) and only focuses on some key organizational factors derived from the IS literature, the findings cannot be generalised to a broader population. However, our in-depth study of the case's phenomenon and the results can potentially contribute valuable theoretical and practical knowledge to the community (Myers, 2000). Future research needs to explore other internal organizational factors, such as culture, to provide a broader perspective of internal organizational factors on IS implementation within public organizations. Future research also needs to be carried out within multiple site studies to increase generalizability as suggested by Schofield (2002). Such a strategy will contribute to extending the findings of this study by providing more evidence to support generalisation of our key findings.

REFERENCES

Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. *European Journal of Information Systems, 11*(1), 35-46.

Allen, B. A. L. G. J. (2001). E-Governance & government on-line in Canada: Partnerships, people & prospects. [Article]. *Government Information Quarterly, 18*(2), 93.

Ash, J. (1997). Organizational Factors that Influence Information Technology Diffusion in Academic Health Sciences Centers. *Journal of The American Medical Informatics Association 4*(2), 102-111.

Astley, W. G., & Van De Ven, A. H. (1983). Central Perspectives and Debate in Organizations Theory. *Administrative science quarterly, 28*(2), 245-273.

Avgerou, C. (2000). IT and Organizational Change: an Institutionalist Perspective. *Information Technology and People, 13*(4), 234-262.

Barki, H., & Hartwick, J. (1989). Rethinking the Concept of User Involvement. *MIS Quarterly, 13*(1), 53-63.

Barki, H., & Hartwick, J. (1994). Measuring User Participation, User Involvement, and User Attitude. *MIS Quarterly, 18*(1), 59-79.

Braa, J. r., Monteiro, E., & Sahay, S. (2004). Networks of Action: Sustainability Health Information Systems Across Dveloping Countries [Article]. *MIS Quarterly, 28*(3), 337-362.

Chatterjee, D., Grewal, R., & Sambamurthy, V. (2002). Shaping up for E-commerce: Institutional Enablers of the Organizational Assimilation of Web Technologies. *MIS Quarterly, 26*(2), 65-89.

Cooper, R. B., & Zmud, R. W. (1990). Information Technology Implementation Research: A Technological Diffusion Approach. *Management Science, 36*(2), 123-139.

Corbin, J. M., & Strauss, A. (1990). Grounded Theory Research: Procedures, Canons, and Evaluative Criteria Retrieved from http://zfs-online.org/index.php/zfs/article/viewFile/2741/2278

Davis, P. S. (2000). Mode Of International Entry: An Isomorphism Perspective. [Article]. *Journal of International Business Studies, 31*(2), 239-258.

Farholt, B., & Wahid, F. (2008). E-Government Challenge and The Role of Political Leadership in Indonesia: The Case of Sragen *Proceedings of the 41st Hawaii International Conference on System Sciences - 2008*, 1-10.

Frederickson, H. G., Rainey, H. G., Backoff, R. W., & Levine, C. H. (1976). Comparing Public and Private Organizations. [Article]. *Public Administration Review, 36*(2), 233-244.

Galliers, R. D. (1991). Strategic information systems planning: myths, reality and guidelines for successful implementation. *European Journal of Information Systems, 1*(1), 55-64.

Ginzberg, M. J. (1980). An organizational contingencies view of accounting and information systems implementation. *Accounting, Organizations and Society, 5*(4), 369-382.

Goodhue, D. L., Wybo, M. D., & Kirsch, L. J. (1992). The Impact of Data Integration on the Costs and Benefits of Information Systems. [Article]. *MIS Quarterly, 16*(3), 293-311.

Gupta, M. P., & Jana, D. (2003). E-government evaluation: a framework and case study. *Government Information Quarterly, 20*(4), 365-387.

Hamilton, S., & Chervany, N. L. (1981). Evaluating Information System Effectiveness -- Part I: Comparing Evaluation Approaches. [Article]. *MIS Quarterly, 5*(3), 55-69.

Heeks, R. (2003). Most E-Government for Development Projects Fail: How can Risks be Reduced? Retrieved 15 November, 2009, from http://unpan1.un.org/intradoc/groups/public/documents/CAFRAD/UNPAN011226.pdf

Holland, C. R., & Light, B. (1999). A critical success factors model for ERP implementation. *Software, IEEE, 16*(3), 30-36. doi: 10.1109/52.765784

Hu, Q., Hart, P., & Cooke, D. (2007). The Role of External and Internal Influences on Information System Security - A Neo-Institutional Perspective. *Journal Strategic Information Systems, 16*, 153-172.

Jin, L., & Robey, D. (2008). Bridging Social and Technical Interfaces in Organizations: An Interpretative Analysis of Time Space Distanciation *Information and Organization, 18*(3), 177-204.

Knoke, D. (1988). Incentives in Collective Action Organizations. *American Sociological Review, 53*(3), 311-329.

Krishna, S., & Walsham, G. (Writers). (2005). Implementing public information systems in developing countries: Learning from a success story [Article], *Information Technology for Development*: Taylor & Francis Ltd.

Kumar, K., & Van Dissel, H. G. (1996). Sustainable Collaboration : Managing Conflct and Cooperation in Interorganizational Systems *MIS Quarterly, 20*(3), 279-300.

Kumar, R., & Best, M. L. (2006). Impact and Sustainability of E-Government Services in Developing Countries: Lessons Learned from Tamil Nadu, India. *The Information Society, 22*(1), 1-12.

Laws, D., Scholz, R. W., Shiroyama, H., Susskind, L., Suzuki, T., & Weber, O. (2002). Expert Views on Sustainability and Technology Implementation. from Natural and Social Sciences Interface (UNS) http://e-collection.library.ethz.ch/eserv/eth:25243/eth-25243-01.pdf

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of Enterprise Systems: The Effect of Institutional Pressure and The Mediating Role of Top Management. *MIS Quarterly, 31*(1), 58-87.

Loh, L. N. (1992). Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect. [Article]. *Information Systems Research, 3*(4), 334-358.

Lucas Jr, H. C., & Baroudi, J. (1994). The Role of Information Technology in Organizational Design. *MIS Quarterly, 10*(4), 9-23.

Luftman, J., & Brier, T. (Writers). (1999). Achieving and Sustaining Business-IT Alignment [Article], *California management review*: California Management Review.

Malone, T. W., & Crowston, K. (1990). What is Coordination Theory and How can It Help Design Cooperative Work System. *Proceedings of the Conference on Computer Supported Cooperative Work, Los Angeles, California, October 1990*, 357-370. doi: <http://doi.acm.org/10.1145/99332.99367>

Markus, M. L., & Tanis, C. (2000). The Enterprise System Experience - From Adoption to Success. In R. W. Zmud (Ed.), Framing the Domains of IT Management: Projecting the Future Through the Past (pp. 173-207). Cicinnatti, OH: Pinnaflex Educational Resources, Inc. Retrieved from http://falconinc.xs4all.nl/navision/navision%20documentation/markus_experience.pdf.

McDaniel, E. A. (2003). Facilitating Cross-Boundary Leadrship in Emerging E-Government Leaders. *Electronic Government, an International Journal, 2*(1), 136-142.

Mirani, R., & Lederer, A. L. (1998). An Instrument for Assessing the Organizational Benefits of IS Projects. *Decision Sciences, 29*(4), 803-838. doi: 10.1111/j.1540-5915.1998.tb00878.x

Misund, G., & Hioberg, J. (2003). Sustainable Information Technology for Global Sustainability. Retrieved 14 December 2010 http://www.ia.hiof.no/~gunnarmi/omd/dig_earth_03/

Myers, M. (2000). Qualitative Research and The Generalizability from The Qualitative Report
http://www.nova.edu/ssss/QR/QR4-3/myers.html

Nah, F. F.-H., & Delgado, S. (2006). Critical success factors for enterprise resource planning implementation and upgrade. *Journal of Computer Information Systems*(special issue), 99-113.

Nah, F. F.-H., & Lau, J. L.-S. (2001). Critical factors for successful implementation of enterprise systems. *Business Process Management Journal, 7*(3), 285-296.

Newman, M., & Sabherwal, R. (1996). Determinants of Commitment to Information Systems Development: A Longitudinal Investigation, Editorial, *MIS Quarterly,* pp. 1-1. Retrieved from http://ezproxy.lib.swin.edu.au/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=27299868&site=ehost-live&scope=site

Perrow, C. (1973). The Short and Glorious History of Organizational Theory. *Organizational Dynamics, 2*(1), 2-15.

Pezzey, J. (1992). Sustainability: An Interdiciplinary Guide. *Environmental Values, 1*, 321-362.

Pinto, J. K., & Covin, J. G. (1989). Critical factors in project implementation: a comparison of construction and R&D projects. *Technovation, 9*(1), 49-62. doi: 10.1016/0166-4972(89)90040-0

Premkumar, G., & Ramamurthy, K. (1995). The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems. [Article]. *Decision Sciences, 26*(3), 303-336.

Raymond, L. (1985). Organizational Characteristics and MIS Success in the Context of Small Business. [Article]. *MIS Quarterly, 9*(1), 37-52.

Rosario, J. G. (2000). *On the leading edge: critical success factors in ERP implementation projects*. Philippines: Business World.

Sabherwal, R., Sein, M. K., & Marakas, G. M. (2003). Escalating commitment to information system projects: findings from two simulated experiments. *Information & Management, 40*(8), 781-798. doi: 10.1016/s0378-7206(02)00104-0

Scheepers, R., & Scheepers, H. (2003). Contexts of Relevance in Explanatory Case Studies in Information Systems: Ubiquitous Information Technology Implementation in Organizations. *ICIS 2003 Proceedings. Paper 3*.

Schofiell, J. W. (2002). The Qualitative Researcher's Companion. In A. M. Huberman & M. B. Miles (Eds.). London: Sage Publications.

Selznick, P. (1948). Foundations of the Theory of Organization. *American Sociological Review, 13*(1), 25-35.

Sharma, R., & Yetton, P. (2003). The contingent Effect of Management Support and Task Interdependence on Suiccessful Information Systems Implementation [Article]. *MIS Quarterly, 27*(4), 533-555.

Somers, T. M., & Nelson, K. (2001). The Impact of Critical Success Factors across the Stages of Enterprise Resource Planning Implementations. *Proceedings of the 34th Hawaii International Conference on System Sciences - 2001*

Stockdale, R., & Standing, C. (2006). An interpretive approach to evaluating information systems: A content, context, process framework. *European Journal of Operational Research, 173*(3), 1090-1102.

Strauss, A., & Corbin, J. M. (1990). Basics of Qualitative Research: Grounded Theory Procedures and Techniques. *Thousand Oaks, CA, US : Sage Publications, Inc*.

Suinaya, G. (2010). *Laporan Ketua Komite E-Development Kabupaten Jembrana Tahun 2010*. Jembrana: Pemkab Jembrana.

Teo, T. S. H., Tan, M., & Buk, W. K. (1997). A Contingency Model of Internet Adoption in Singapore *International Journal of Electronic Commerce, 2*(2), 95-118.

Waal, A. A. d. (2003). Behavioral factors important for the successful implementation and use of performance management systems. *Management Decision, 48*(8), 688-697.

Wallach, E. J. (1983). Individuals and Organizations: The Cultural Match. *Training & Development Journal, 37*(2), 28.

Walsham, G. (1995). Interpreting Case Studies in IS Research: Nature and Method. *European Journal of Information Systems, 4*, 74-81.

Walsham, G. (2006). Doing Interpretive Research. *European Journal of Information Systems, 15*(3), 320-330.

Winasa, G. I. (2009). Filosofi Leadership Kami adalah Kepemimpinan Air. *Majalah e-Indonesia*. Retrieved from http://www.majalaheindonesia.com/Bupati%20Jembrana.htm

Yin, R. K. (1981). The Case Study Crisis: Some Answers. *Administrative science quarterly, 26*(1), 58-65.

Yusuf, Y., Gunasekaran, A., & Abthorpe, M. S. (2004). Enterprise information systems project implementation:: A case study of ERP in Rolls-Royce. *International Journal of Production Economics, 87*(3), 251-266. doi: 10.1016/j.ijpe.2003.10.004

Zhang, L., Lee, M. K. O., Zhang, Z., & Banerjee, P. (2003). Critical Success Factors of Enterprise Resource Planning Systems Implementation Success in China. *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03)*, 10.

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