



Author: Nurdin, Nurdin; Stockdale, Rosemary; Scheepers, Helana
Title: The role of social actors in the sustainability of e-government implementation and use: experience from Indonesian regencies
Conference name: Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS 47)
Conference location: Waikoloa, Hawaii, United States
Conference dates: 06-09 January 2014
Place published: United States
Publisher: IEEE
Year: 2015
Pages: 2263-2272
URL: <http://hdl.handle.net/1959.3/357269>

Copyright: Copyright © 2014 IEEE. The accepted manuscript is reproduced in accordance with the copyright policy of the publisher. Personal use of this material is permitted. Permission from IEEE must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copy righted component of this work in other works.

This is the author's version of the work, posted here with the permission of the publisher for your personal use. No further distribution is permitted. You may also be able to access the published version from your library.

The definitive version is available at: <http://dx.doi.org/10.1109/HICSS.2014.285>

The Role of Social Actors in the Sustainability of E-government Implementation and Use: Experience from Indonesian Regencies

Nurdin Nurdin
Faculty of ICT, Swinburne University
of Technology, VIC, Australia,
nnurdin@swin.edu.au;
STAIN Datokarama Palu and STMIK
Bina Mulia Palu, Indonesia,
nnurdin@stain-palu.ac.id

Rosemary Stockdale
Faculty of ICT, Swinburne
University of Technology, VIC,
Australia,
rstockdale@swin.edu.au

Helana Scheepers
Faculty of ICT, Swinburne
University of Technology
VIC, Australia,
hscheepers@swin.edu.au

Abstracts

The sustainability of e-government implementation and use involve many actors. However, limited studies have addressed how actors play a role in the sustainability of e-government implementation and use in particular at local government level. This study uses social actor theory from Lamb & Kling [1] to explore the role actors play in the sustainability of e-government within two regencies in Indonesia. Social actor theory posits that the social actors play various roles to produce goods and services through interactions with other actors in various contexts both internal and external organizations. Our findings show that e-government implementation and use within local government was sustained by social actors that play roles across four dimensions; affiliation, environment, interaction, and identity. Our study contributes to better understanding of how social actors across internal local government hierarchies (users and implementers in the regency office, districts, and villages) and external local government (e.g. central government institutions, vendors, and citizens) play roles in sustaining e-government.

1. Introduction

Electronic government (e-government) has become an important issue for public administration around the globe. E-government is possible due to a combination of information technology products and new principles of public administration [2]. The main objectives in deploying and sustaining e-government implementation and use within organizations are “to change the structure and process of government organisations aiming at performance improvement” [3] and increase citizens access to government services [4]. For this study we define sustainability as “technology that is capable of being maintained over a long span of time independent of shifts in both hardware and software” [5].

However, maintaining e-government implementation and use over a long period of time also requires sustainable resources and support from various actors. Seldom a single actor is able to make changes [6] but rather a collection of social actors should

leverage resources through interactions to build and sustain innovation within organizations. We believe that a government organization consists of many different actors at different hierarchical levels. This leads us to view an organization as “an assemble of collective actors” [1] or an organization as “aggregations of individuals, as instantiations of the environment, as nodes in a social network, as members of a population, or as a bundle of organizing processes” [7].

Previous studies [8-10] argue that the success and failure of e-government is determined by the level of involvement of various actors. A lack of involvement of actors (such as a lack of public-private partnership) resulted in failure, while actively involved actors (such as strong collaboration among government institution and good partnership between government and private sectors) have resulted in e-government implementation and use success. However, very few studies have addressed the role of actors in support the sustainability of e-government implementation and use in particular at local government level. This study, therefore, attempts to address how actors play roles in sustainability of e-government systems within local government organizations.

In this study we view actors from a social perspective as suggested by Lamb and Kling [1]. Therefore we define social actors “as an organizational entity whose interactions are simultaneously enabled and constrained by the socio technical affiliations and environments of the firms, its members, and its industry” [1]. By understanding the interaction among social actors, (such as between individual in groups, among groups within an organization, among groups and individuals performing roles in different organizations, etc. [1], we can improve understanding toward how an innovation is shaped and sustained by those actors.

This study, therefore, may shed light on understanding the roles social actors play in sustainable e-government systems implementation and use. The focus of the paper will be on how different actors perform their roles to achieve their common goals in sustaining e-government systems within Indonesian local government context. In understanding this phenomenon, this study attempts to answer the following question:

Who are the social actors involved and what roles do they play in the sustainability of e-government implementation and use?

The structure of this paper is as follows, the next section presents a theoretical review of social actor theory, actors in e-government implementation and use, and e-government sustainability. The research methodology is presented in section 3, while section 4 describes the two cases. Findings of this research are then presented followed by the discussion and conclusions. Limitations and future research are discussed in the final section.

2. Literature review

This section discusses the following constructs: sustainability, social actors, and actors in e-government implementation and use.

2.1 Social actors

Lamb & Kling [1] argue that social actors play various roles to produce goods and services through interactions with other actors in various contexts. Those social actors interact with one another across organizational levels as well as with external organizational actors through a variety of mechanism (such as coordination) to exchange resources. These interactions form the basis for social actors' identity in support of organizational and inter organizational activities.

Social actors have been considered to play important roles in information system (IS) implementation and use. The actors play multi-faceted roles in internal and external organization environment [1, 11]. The actors may be characterized as professional individuals, groups of firms, or organizational members acting collectively, or organizations interacting with regulators from the environment [12]. They can be located at different levels of organizations within or outside the organizations. Lamb [12, 13] and Lamb & Kling [1] identify four dimensions related to social actors: environment, affiliation, interaction, and identities. Social actors are not merely IT users but can also be developers and implementers and can have multiple roles in the use and implementation of IS. Each dimension is now discussed in more detail and related to local e-government implementation and use.

Affiliation is the relationship of an individual (social actor) with local, national and International networks [1, 12, 13]. Lamb and Kling [1] argue that those relationships may occur at different levels such as local, inter-group, group, organization, and inter-organization. Lamb &Kling [1] add that these types of affiliations become a basis for an organization to make decisions regarding their use and development of IT. In relation to local e-government implementation and use context, social actors' affiliation includes other local governments, local citizens and businesses, and central government institutions.

Environment is stabilized, regulated and/or institutional practices, associations and locations, which exert pressure on an organization and its members (social actors) [1, 12, 14]. Environment actors might enhance or constrain organizations to adopt and implement a policy, such as e-government. These practices include regulation [15, 16] and standards [17]. Garud, et al., [17] argue that technological standards are key elements which enable or constrain actors in using technology.

Interaction is understood as resources and media of exchange which are mobilized by individuals when they interact with other organizations [1, 12, 13]. These interactions are shaped by industry environment and by the nature of the affiliations. A key aspect of the interactions is coordination and cooperation within the boundaries of the industry environment. Interaction by organization members may also be guided by legitimate communication mechanisms such as coercion, mandate, and sanction to maintain formal and informal standards of behaviour across organizational level [1].

Identities of social actors is "*people's source of meaning and experience*" [18] and is created for an individual or collectively through roles and norms which is structured by institutions and organizations. This presentation and identity may be derived from social actors use of ICT and determine how they work with the technology [1]. Lamb and Kling [1] add that social actors may present themselves as coherent collective actors in a project they participate in by contributing their expertise.

2.2 Actors in e-government implementation and use

The literatures identify actors that are commonly involved in e-government implementation and use. These actors are often associated with stakeholders [e.g: 16, 19, 20, 21], users [22-25], and implementers [26-28]. E-government users can be government employees (who utilize e-government to provide government services), citizens, politicians, private entities such as businesses and not-for-profit organizations. Implementers are actors who are involved in e-government implementation such as government IT staff, policy makers, and vendors.

This study defines the use of e-government as "*the utilization of information technology (IT) by individuals, groups, and organizations*" [29]. Meanwhile, e-government implementation is defined based on the term implementation proposed by Rogers [30] who defines technology implementation "*all of the events, actions, and decisions involved in putting an innovation into use*". This definition highlights that implementation is "*an ongoing social process*" [31] which requires ongoing effort from many actors before the innovation is used to enable routinization for a prolonged period. This long implementation process is described as "*events and actions that pertain to modifying the innovation, preparing the organization*

for its use, trial use, acceptance of the innovation by the users and continued use of the innovation until it becomes a routine features of the organization” [32]. This means all actors are continuously engaged in the implementation and use of e-government to achieve the sustainability.

2.3 E-government sustainability

E-government sustainability is understood as an activity of making information systems work over time within an organizational setting [33] or the IS is in continuous operation and development [34] to provide continuous value for an organization [35]. For the purpose of this study e-government sustainability is understood as the ability of government organizations to continuously operate and use e-government systems over a long period of time to provide continuous benefit for both government organizations and stakeholders.

The sustainability of IS need activities such as evaluation, system improvement, and human skills improvement [36]. This implies that government organizations’ ability to sustain their IS requires effort and resources. This includes continuous resources support from all participating actors within and outside organizations [33]. The resources are required to maintain the system, to ensure that it is continuously operated and developed within the organizations.

3. Methodology

This study selected two regencies as a basis to understand how social actors within both regencies play roles in sustaining the e-government implementation and use. Our consideration was based on the advice of Dooley [37] that a case must represent bad or good practices, failure or success. The two cases of e-government sustainability at local context fulfil the requirements outlined by Dooley [37]. 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 [38]. E-government implementation and use is a complex phenomenon due to the many institutions involved. The complexity emerges as a result of institutions’ interaction, across social, political, and cultural contexts during implementation, and this complexity can be understood through interpretive case study research [39-41].

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 21 participants from management level and from technical employees. Data collection from different levels of an organization hierarchy will contribute to drawing more informed conclusions from this study [42]. The first field visit was carried out in early March to the end June 2011, and then followed by another three follow-up visits on November 2011, March 2012 and September 2012. Several follow-up

contacts were also made to gain more insights. These include emails, phone calls, and online chats. Field notes and memos were made during field visits. Written materials that support the main data were also collected.

Data analyses broadly followed the method outlined by Strauss and Corbin [43] in that the data analysis was carried out through iterations; open coding, axial coding and selective coding. We also took into consideration Urquhart, et al.,[44] data conceptualization strategy in gaining in-depth insight and understanding. The conceptualization process is started from a simple process (description) where the researcher begins initial understanding of the concepts at the level of categories and properties through open coding. Conceptual saturation was reached when no new categories were generated from the open codes and the gap in emerging concepts were filled [45]

4. Case Description

We carried out our research in two regencies in Indonesia; Jembrana and Luwu Utara regencies. Jembrana is in Bali province that has successfully implemented and used a number of e-government systems since 2001 when they started cooperating with central government institutions. The regency has received the best e-government award twice due to their success in e-government implementation and associated reform to their organizational performance and services. Furthermore, Jembrana regency was also awarded the best local government for their e-voting system implementation which was developed by the local IT staff.

Luwu Utara is a regency in South Sulawesi province. The implementation of e-government system within this regency was formally started when the regency adopted and implemented e-procurement systems in 2009. However, prior to the e-procurement system the regency implemented the departmental financial information system and demographic information system. Luwu Utara has been awarded the most innovative local government in IT implementation in 2011 due to their success in the implementation and use of the government procurement system.

5. Findings

The analyses of the collected data (written material, field notes, memos, and interview data) provided insights into the roles of social actors in sustainable local e-government implementation and use. The four dimensions: affiliations, environments, interactions, and identities were used to analyze the data.

4.1 Affiliation

As discussed before affiliation is the relationship of social actors which is determined by organizations affiliation with other actors at various levels such as local, national, and international [1, 12, 13]. In this

study it was evident that both the regencies' relationships were built with a variety of actors for example central government institutions, other local government, private sector, between departments within the regencies, and local political members. Their affiliations were reflected in a variety of activities in sustaining e-government within both regencies that will be discussed below.

Central government: The regencies interact with a number of central government institutions in the implementation and use of e-government. The central government interacts through a number of institutions such as Ministry of Interior Affairs and Agency for the Assessment and Application of Technology (BPPT). The Ministry is responsible for most of the local government policy implementation because local government is under the responsibility of the Ministry. BPPT is in charged with IT research and implementation across institutions in Indonesia. Central government institutions can impose the implementation and use of e-government at local level but also provide support to ensure sustainability. For example a participant said:

E-Identification (E-ID) is the central government policy and we have to support the implementation. Now we have successfully implemented the system in eleven district offices and all the hardware are located in the district offices not in this regency office. We are here as coordinator who monitor the implementation. All the system and hardware were transferred by the Ministry of Interior Affairs in Jakarta. We are responsible for operational cost only such as employees' incentive payment because they have to work overtime (L.9).

The relationship between the regencies and central government is continuously maintained to ensure ongoing operation of e-government systems. This includes interaction during the systems maintenance and development. Interactions also take place when the regencies develop and implement their own systems.

Other local governments: Some Indonesian local governments have implemented and use e-government since early 2000 such as Sragen regency and Surabaya municipality. Sragen is a well-known local government which has implemented a computer network and an integrated system within the local government secretary office since 2002 [46] while Surabaya city is renowned for implementing an government e-procurement system. Both regencies have developed relationships (affiliations) with other local government organisations due to their successful e-government implementation and use. For example participants from Luwu Utara regency mentioned how they were influenced by the success in e-government procurement implementation and use of the Surabaya municipality:

I got information from my friends that Surabaya city had implemented and used an online auction system, and then I discussed that with the head of Department of Transportation, Communication, and Information and the Regent. After that we went to Surabaya to learn about the system. We learned a

lot from them. Only a few local governments in Sulawesi have used the system, but in South Sulawesi province, Luwu Utara is the first local government that implements and uses the system (L2).

Jembrana local government also look at other regencies regarding sustainable e-government implementation. For example, the implementation of E-ID within Jembrana local government was influenced by the successful implementation of E-ID by Yogyakarta municipality. However, the Jembrana IT team improved the E-ID system to suit their local government stakeholders' demands.

Citizens and local business: Citizens and local businesses influences have played a significant role in the sustainability of e-government in both regencies. They demanded better government services from the regency. For example, a participant expressed the reason for the implementation of e-licensing system as follows:

The system was implemented due to an increase in demand from citizens and business for the licensing process. Previously, it took a long time to process a license and the processes were not well ordered. Sometimes people who apply earlier did not get their licenses first and it caused tension between us and the applicants because they think we had done something negative (J.11)

Politicians: Regencies leaders have a close relationship with the local parliament members to obtain political support. Local politicians' support was showed through their involvement in the implementation of e-government. For example, when Luwu Utara regency made cooperation with another local government, some politicians together with the regency leader went to Surabaya municipality to learn about e-government implementation and use.

Interactions between local leaders with politicians have also resulted in strong support for annual budget allocation to sustain e-government implementation and use. Their engagements were not only intended to smooth the budget allocation but also to counter resistances regarding e-government implementation and use as described by the following participant:

In the beginning when we implemented the systems, many people did not agree. They said it was a waste of money and it was not legal.... but when they approached the DPRD (local parliament) they support us. We were able to justify our policy and then we regularly allocated annual budget for the e-government systems. We use the budget to pay our outsource workers, Internet bandwidth, maintenance, and incentives to our IT staff (L.1)

5.2 Environments

Environment is pressure on organizations and actors due to stabilized, regulated and/or institutional practices, associations and locations [1, 12, 14]. Citizens, businesses and central government have placed significant pressure on local government to

implement and use e-government systems. This study's findings suggest that regulations, national standards, and socio-economic pressures all played a role in shaping the actions of the regencies to sustain their e-government systems.

Regulation: E-government adoption and implementation in Indonesia context is regulated by Presidential instruction no. 3 year 2003. The Presidential Instruction states that all government institutions from central to local levels must implement and use e-government systems. During the interviews, participants explicitly referred to the regulation and other regulations regarding e-government systems implementation within the regency. For example, regulation number 14 year 2008 require local government to disclose information to citizens which led to establishment of official local websites. Presidential decree number 26 year 2009 regulates E-ID implementation, and Central government regulation No. 58 year 2005 and Ministry of Internal State Affairs No. 55 year 2008 regulate local government financial information system.

There's a regulation of public disclosure; so, government should be transparent and IT will help government to be transparentThe information associated with the budget or local government regulations must be published (J.2)

Standards: Many standards have been established to support the sustainability of e-government implementation and use within both local government institutions. The standards were established by central government and the local governments. Van de Ven, et al., [47] argue that standards can be mandated by government or regulatory bodies or they can be established voluntarily. In this study context, mandatory standards were imposed by central government institutions to standardize e-government implementation and use policies within all local governments. For example, Ministry of Communication and Information established Standard Information System Development for Municipality /Regency and Standardization of website domain names for government institutions.

Voluntary standards were established by the local government to ensure uniformity of e-government use within their own context. This type of standards, according to Van de Ven, et al., [47], is normally established through cooperation and consensus among organizations. For example, in Jembrana regency a standard (blue-print) for long term e-government implementation, development, use and maintenance was established based on cooperation between the regency and a central government institution (BPPT) for the regency context. A participant said:

Today we still cooperate with the BPPT in e-government implementation by following their blue print and improve it (J.5)

The blue-print developed for the Jembrana regency can also be categorized as a technical standard for technological evolution [48] within the regency because

it describes details of implementation, development, use and maintenance.

Socio economic pressures: Both Jembrana and Luwu Utara regencies are relatively poor compared to other regencies within their provinces. The regencies collect a small portion of their annual budget from farming, small and medium enterprise, while the biggest portion is provided by central government. For example, in 2010, Jembrana regency's annual budget comprised of 84.5 % central government transfer, 10.4 % from provincial tax sharing and grant, and only 5.1 % of the budget was from local government revenue. This lack of resources and revenue put the local government under pressure to act innovatively through the implementation of e-government systems that is able to reduce operational cost. One participant explained it as follows:

Since we don't have money, we think innovatively. If we are continuously short of funds, we will be rejected by people. Then we think what can we do with IT to improve our region (J.2).

In Luwu Utara regency social conflict caused by rampant corruption and collusion is an environmental factor that put pressure on the regency to sustain the e-government systems use. The social factors also include a lack of transparency in the management and auction of regency projects. The corruption and collusion involved regency employees, leaders and families, politician families' members, and non-government organizations (NGO). The social conflict resulted in significant pressure on the regency leaders to sustain use of e-government to reduce this situation.

5.3 Interaction

Interaction is understood as resources and media of exchange which are mobilized by individuals within an organization when they interact with other organizations [1, 12, 13]. These include the organization members' effort to establish their interaction mechanism which in some cases requires coordination and cooperation. Both regencies' social actors interact through their resources, such as infrastructures, and human skills. These resources mediate and facilitate the interaction between various levels of government such as departments, districts, and villages. The interactions were mediated through mechanisms; coordination, cooperation, and communication.

Coordination: E-government is demanded and imposed by stakeholders from the environment. These demands cause the regencies to sustain their e-government. For example, Jembrana regency employees in the Department of Civil and Civilization Services make coordinated with the Ministry of Interior Affairs in sustaining the Demographic Information system. Furthermore, the use of this system is regulated by Central Government Regulation no. 23 year 2006 which further ensured the need for interaction. Example of coordination is described by the following participant:

Department of Internal State Affairs takes care of the server and coordinate directly with the central office in Jakarta (Ministry of Internal State Affairs), not with [the local] IT division. But if something happens, they do coordinate with us to discuss what exactly happens to the server then report to Jakarta (J.5)

Meanwhile Luwu Utara regency regularly coordinate with the Bureau for Government Goods and Services Procurement Policy (LKPP) to keep the SPSE (electronic procurement) system operating and utilized for local e-procurement service. Sometimes coordination is aimed at gaining approval for the cancelation or delay of an auction. The local government have to notify the central LKPP in Jakarta if this happens.

Cooperation: Cooperation with various actors, such as with central government institutions, other local governments, private sector, and between local institutions, was intended to access resources. These resources include financial, infrastructures, human skills, and technical assistance. For example, Luwu Utara regency drew up a formal memorandum of understanding with a municipality to get an e-government system. A participant said:

I told him that the system is successfully used in Surabaya since 2002. The Regent, some of the DPRD [local legislative] members, and I, then, went to Surabaya city and made a MOU (memorandum of understanding) with the city. After the Regent signed the MOU with Surabaya city, they gave us the system to use in our local government (L.1)

Cooperation with other local governments was also intended to obtain skills and knowledge regarding technology. The knowledge and skills obtained from other local governments were then transferred to other local employees and stakeholders.

Communication: Effective communication strategies are a phenomenon that contribute to common understanding between social actors within the local government towards e-government implementation and use sustainability. The e-government initiative is clearly communicated to all actors regarding its operation and use across organization level and units. For example, the local government political leader (the Regent) issued a local regulation to send messages to all actors within the regency that the e-government systems must be utilized to improve their work performances. The regulation does not only mandate all social actors to utilize the systems but also provide guidance for each actor regarding how they implement, maintain, develop, and use e-government systems within their departments.

Persuasive and coercive communications were often used to motivate social actors to collectively support the e-government implementation sustainability. Persuasive communication took the form of rewards. For example, all IT staff within the IT team was given incentives to encourage them to work harder as described by the following participant:

Of course they receive a salary but that is not enough, we give them more rewards. if they work

from morning till late evening they are tired, so we give them extra money for lunch, although they have been paid (J.1)

Coercive communication was also used to ensure all social actors within the local government pay serious attention to the e-government implementation and use it for their daily activities. These strong messages are often delivered at every leaders meeting.

5.4 Identity

Identities refer to social actors' individual or collective individual presentation of roles and norms which is structured by institutions and organizations [18]. This study finding suggests that the identity of actors within both regencies were reflected in their cultural norms and sense of collectivism. Cultural norms were manifested in the change of actors' mindset (individual or groups of employees) towards e-government use, while sense of collectivism was manifested in sharing the responsibility to support the e-government system use.

Cultural norms: Both regencies changed the employees and leaders mindset towards e-government implementation and use within the regencies' institution. Jembrana regency used coercive and persuasive approaches to change their employees and middle managers beliefs. IT team cooperated with the regency and departmental leaders to persuade and force their staff to utilized technology in work places. Coercive approach was intended to gain employees and middle leaders' commitment to use the e-government system regularly in daily works.

We really paid serious attention to that issue because we have stated in every meeting that all departments must use technology to serve citizens. That is one way to ensure efficiency in our local government....Even, our leader threatens to cut the budget of a department if they do not use IT or a systems that we have provided for them (J.3)

Work culture was adapted to accommodate e-government system use within both regencies. Employees were required to adjust their work patterns to technology. For example, employees were forced to be more disciplined with data update on the websites. Similarly, stakeholders' (e.g. businesses and citizens) norms and culture were also changed to familiarize themselves with the use of e-government. Rural citizens' norms and culture were adapted through exposure of technology within village areas.

Collectivism: Sense of collectivism was established through the sharing of the burdens and responsibility to sustain e-government within the regencies. This includes volunteer resource endowments among internal regencies' actors. The local leaders expect all actors collectively to take some of the burden in sustaining e-government within the regencies. For example, the e-government network infrastructure within Jembrana regency was successfully built through a collaborative financial scheme. Each institution such as districts, villages, and schools contributed to the

funding needed. The network infrastructure, which is called J-Net (Jimbarwana Network), integrates Jembrana central office, districts, villages, schools, hospitals, and other institutions in a network. A participant said:

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 districts donated 60 million, villages 40 million, and schools 30 million rupiah (1 million rupiah equal to US \$1100) (J.1)

Meanwhile, Luwu Utara regency leader supported the implementation and use of e-government to combat corruption and collusion. The political members were involved from the beginning of the e-procurement system implementation to provide political support. The local government and legislative institution cooperation was also intended to overcome political and social resistance of the system implementation because some regency leaders and companies resisted the e-government procurement system. In addition, some companies involved in the regency's goods and services auction are also related to parliament members' family and friends. As a result, the collaboration between local leaders and political institutions eased resistance from local businesses.

6. Discussion

Based on our findings, we will use the argument from Lamb and Kling (2003) to discuss how social actors play a role in sustaining e-government implementation and use while interacting with other actors.

Affiliation:

Inter-organizational and within organization relationship of the regencies shaped practises associated with e-government use. Lamb and Kling (2003) argue that affiliations shape decisions related to IT use. In the two cases it was clear that the affiliations between Central government and the regencies played an important role in compelling regencies to implement and use e-government systems. However, the central government also enabled the regencies to implement and use their e-government systems through support. For example, central government provided systems and human resources training to sustain the implementation and use of e-government.

The prevalence e-government of implementation and use practices within local government organisations will encourage other local governments to implement similar initiative [e.g:49, 50]. Some e-government systems such as e-ID were implemented due to the affiliation with other local governments. For example, Jembrana implemented and used their new e-ID system in 2007 after they learned from Yogyakarta municipality. Meanwhile, Luwu Utara regency

implemented and used e-government procurement systems from Surabaya municipality.

Local citizens and business actors play roles through demanding better service and transparency. The implementation and use of licensing application system, for example, was caused by the pressure from citizens and business to obtain a licence through a transparent and time efficient process. This means the implementation and use of the e-government practices is strongly shaped by the local government organization relationship with central government, other local government organisations, and its clients as suggested by Lamb and Kling [1].

Environments:

Lamb & Kling [1] argue that organizational members' practices of IT are stabilized, regulated, and institutionalized by their environment. This study suggests that the environment enable the regencies to sustain their e-government implementation and use through pressures. Presidential decree No. 3 year 2003 (first regulation on e-government) encourages the regencies to implement and use e-government. This regulation has also been referred to by other regulations that mandate local government to implement and use e-government systems. For example, e-ID was implemented and used as the consequence of presidential decree No. 26 year 2009 and No. 35 year 2010 and financial information system was adopted based on rule No. 56 year 2005. The government institutions responsibility for disclosing information to citizens is regulated in Law No. 14 year 2008. According to the law, government institutions must establish information and documentation system that enables citizens' access. Jembrana regency, then, constructed their website to comply with the regulation. At the same time, regulations also support the regencies to justify their actions in sustaining e-government such as regular financial allocation.

Our analyses also show that socio-economic environment has caused both regencies to sustain their e-government systems to increase efficiency and transparency. There might be a question from readers regarding how a local government with low budget implements and uses technology within their organizations because it consumes a large part of their budget which should be used for their regional development. However, institutional theories argue that *"an institution will be innovated if the expected net gains exceed the expected costs"*[51]. Both regencies have been able to generate direct and indirect benefits from the e-government more than the costs they invested because the regencies are able to reduce operational costs, improve service deliveries, and reduced collusion and corruption.

Interaction:

Interaction of social actors within both regencies was shaped by their relationship with the environment

and their clients (e.g. local citizens and businesses). Lamb & Kling [1] argue that clients' demands exert major influence on IT use practice by organization members. Both actors within the regencies continuously coordinate, cooperate, and communicate through a variety of mechanisms to develop, implement, use, modify, and maintenance their e-government services as required by their environment.

Coordination and cooperation among the local government social actors have been practiced vertically, such as with central government departments, and horizontally, such as between departments, other regencies, and private agencies. The regencies' ability to practice a variety of coordination and cooperation mechanisms [e.g: 52] helped the regencies successfully manage their e-government systems implementation and use. The interaction through the coordination and cooperation support them to perform cooperative activities with multiple agencies to harmonize tasks and gain resources to sustain the operation and use of the e-government systems.

Strategic communication has enhanced interaction between internal organizational members and with external actors. The communication was practiced through persuasive and coercive approaches to increase awareness and convince internal actors to use e-government. Other than increase awareness and convince organizational actors, strategic communication can also generate commitment [53] to support e-government implementation and use. Intensive communication between regencies IT team with central government, between local department leaders, and between IT team with districts IT staff users have also enhanced more positive interaction in sustaining e-government. For example, Lamb and Kling [1] found that information exchange through communication yields positive interaction between technology users.

Identity:

Organisational members are constructing their identities while implementing and using e-government systems [1]. The regencies' social actors constructed their identities through a collective action. The collective action was reflected in the change of cultural norms regarding perspectives toward e-government implementation and use. This led to the regencies' social actors' willingness to collaboratively take action to sustain their e-government. For example, local

leaders collectively work hand in hand with local parliament members to successfully implement and use e-government in Luwu Utara regency, while social actors in Jembrana regency voluntarily shared the financial burden to build and maintain J-NET network.

This study argues this type of collective action is a unique identity constructed and presented by local actors in sustaining their e-government. Van de Ven [6] uses the term "running in packs" to describe how actors take collaborative action in achieving their goals. Single actors is unlikely to achieve a goal because they do not have sufficient resources. Similarly, as Jembrana actors manifested their collaborative action identity in sustaining e-government implementation and use, they are able to reduce constraints in technical, human and economic resources. For example, Jembrana successfully built J-NET through a financial collaboration scheme 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.

Chatterjeje, et al., [52] use the term "sharing of risks" in addressing this type of sharing responsibilities. This study also views the "responsibilities and burden" of sustaining e-government as "risks". For example, there is a risk of failure of the J-NET infrastructure operational because of the high cost of the infrastructure which requires resources to maintain the hardware. However, due to the collective action of the regencies' social actors the responsibilities and burden could be shared between local actors.

7. Conclusion

The findings show that four dimensions of social actors; environment, affiliation, interaction, and identity have played a significant role in the sustainability of e-government systems implementation and use within both regencies. For example, environment played a role by pressuring and influencing the regencies to implement and use of e-government systems. Both regencies interacted with different agencies and build their unique identities by enacting the e-government systems. However, our findings also suggest that social actors are influenced by regulations, standards, and socio-economic pressure because these environment factors were able to enhance or constraint the IT practices as argued by Lamb & Kling [1]. A summary of social actor and their roles are depicted in table 1.

Table.1 Social actors' roles

Actors	Roles and consequences
Central government	Central government impose and provide support for the sustainability of e-government within the regencies. Both regencies made interaction with central government trough coordination and cooperation
Other local	Other local government influence the regencies through cooperation to provide resources and technical supports. Both regencies also mimic other local

government	government in sustaining their e-government.
Local stakeholders	Local citizen and businesses demand better regencies' services through e-government systems. The regencies responded the demand by implementing and use e-government. At the same time, both local governments also cooperate with the local actors to access resources.
Politicians	Politicians provide political support for e-government to ease budget allocation. Collaboration between politician and local government support the sustainability financial allocation and reduce political barriers.
Employees	Employees collaboratively support the implementation and use of e-government through sharing responsibilities

Our study provides in depth insight on what actors, identifying who they interact with, about what issues, and under what conditions, what is the consequences in the sustainability of e-government within two regencies in Indonesia. We expect this study will benefit government organizations as it helps to explain the roles played by social actors in sustaining e-government implementation and use.

8. Limitation and Future Research

This study was carried out within two regencies in Indonesia and the findings may provide a new perspective on how social actors play a role in the sustainability of e-government implementation and use within local government levels in particular in developing countries. Since this study was carried out in two small regencies, the findings might not be generalised to a broader population. However, our in-depth study of the cases and the results can potentially contribute valuable theoretical and practical knowledge to the community [54]. Future research needs to explore other social actors to provide a broader perspective of social actors' roles in sustainable e-government implementation and use. Future research also needs to be carried out within more local governments to increase generalizability as suggested by Schofield [55]. Such a strategy will contribute to extending the findings of this study by providing more evidence to support generalisation of our key findings.

9. References

1. Lamb, R. and R. Kling, Reconceptualizing Users as Social Actors in Information Systems Research MIS Quarterly, 2003. **27**(2): p. 197-235.
2. Yuan, L., C. Xi, and W. Xiaoyi, Evaluating the readiness of government portal websites in China to adopt contemporary public administration principles. Government Information Quarterly, 2012. **29**(3): p. 403-412.
3. Mofleh, S., M. Wanous, and P. Strachan, Understanding National E-government: The Role of Central Government Electronic Government, an International Journal 2009. **6**(1): p. 1-18.

4. Evans, D. and D.C. Yen, E-government: An analysis for implementation: Framework for understanding cultural and social impact. Government Information Quarterly, 2005. **22**(3): p. 354-373.
5. Misund, G. and J. Hioberg, Sustainable Information Technology for Global Sustainability. 2003.
6. Van de Ven, A.H., Running in Packs to Develop Knowledge-Intensive Technologies. MIS Quarterly, 2005. **29**(2): p. 365-377.
7. King, B.G., T. Felin, and D.A. Whetten, Perspective—Finding the Organization in Organizational Theory: A Meta-Theory of the Organization as a Social Actor. Organization Science, 2010. **21**(1): p. 290-305.
8. Gil-García, J.R. and T.A. Pardo, E-government success factors: Mapping practical tools to theoretical foundations. Government Information Quarterly, 2005. **22**(2): p. 187-216.
9. Heeks, R., E-Government in Africa: Promise and Practice. Information Polity, 2002. **7**(2-3): p. 97-114.
10. Heeks, R., Information Systems and Developing Countries: Failure, Success, and Local Improvisations. The Information Society, 2002. **18**(2): p. 101-112.
11. King, J.L., et al., Institutional Factors in Information Technology Innovation, in Information Systems Research. 1994, INFORMS: Institute for Operations Research. p. 139-169.
12. Lamb, R., Intranet Boundaries: Social Actors and Systems Integration. 15th Bled Electronic Commerce Conference eReality: Constructing the eEconomy, 2002.
13. Lamb, R., Alternative Paths Toward a Social Actor Concept. Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th 2006, 2006: p. 11.
14. Lawrence, T.B., C. Hardy, and N. Phillips, Institutional effects of interorganizational collaboration: The emergence of proto-institutions. Academy of Management Journal, 2002. **45**(1): p. 281-290.
15. Jun, K.-N. and C. Weare, Institutional Motivations in the Adoption of Innovations: The Case of E-Government. Journal of Public Administration Research & Theory, 2010. **21**(3): p. 495-519.
16. Kamal, M., V. Weerakkody, and Z. Irani, Analyzing the role of stakeholders in the adoption of technology integration solutions in UK local government: An exploratory study. Government Information Quarterly, 2011. **28**(2): p. 200-210.
17. Garud, R., J. Sanjay, and K. Arun, Institutional Entrepreneurship in the Sponsorship of Common Technological Standards: The Case of Sun Microsystems

- and Java. *Academy of Management Journal*, 2002. **45**(1): p. 196-214.
18. Castells, M., *The Power of Identity*. Second ed. 2010, Singapore: Blackwell Publishing Ltd.
 19. De', R., *E-Government Systems in Developing Countries: Stakeholders and Conflict*, in *Electronic Government*, M. Wimmer, et al., Editors. 2005, Springer Berlin Heidelberg. p. 26-37.
 20. Rowley, J., *e-Government stakeholders—Who are they and what do they want?* *International Journal of Information Management*, 2011. **31**(1): p. 53-62.
 21. Reinwald, A. and P. Kraemmergaard, *Managing stakeholders in transformational government — A case study in a Danish local government*. *Government Information Quarterly*, 2012. **29**(2): p. 133-141.
 22. Folstad, A., H.D. Jorgensen, and J. Krogstie, *Users Involvement in E-Government Development Projects*. *Nordic Conference on Human-Computer Interaction: Proceedings of the third Nordic Conference on Human-Computer Interaction*, 2004. **82**: p. 217-224.
 23. Ke, W. and K.K. Wei, *Successful E-Government in Singapore*. *Communications of The ACM*, 2004. **47**(6): p. 95-99.
 24. Hung, S.-Y., C.-M. Chang, and S.-R. Kuo, *User acceptance of mobile e-government services: An empirical study*. *Government Information Quarterly*, 2013. **30**(1): p. 33-44.
 25. Hung, S.-Y., C.-M. Chang, and T.-J. Yu, *Determinants of user acceptance of the e-Government services: The case of online tax filing and payment system*. *Government Information Quarterly*, 2006. **23**(1): p. 97-122.
 26. Dada, D., *The Failure of E-Government in developing Countries: A Literature review*. *The Electronic Journal of Information Systems in developing Countries*, 2006. **26**(7): p. 1-10.
 27. Heeks, R. and S. Bailur, *Analyzing E-Government Research: Perspectives, Philosophies, Theories, Method, and Practice*. *Government Information Quarterly*, 2007. **24**(2): p. 243-263.
 28. Heeks, R., *Understanding e-Government Project Trajectories from an Actor-network Perspective*. *European Journal of Information Systems*, 2007. **16**: p. 165-177.
 29. Straub, D. and M. Limayen, *Measuring System Usage: Implications for IS Theory Testing*. *Management Science*, 1995. **41**(8): p. 1328-1343.
 30. Rogers, E.M., *Diffusion of Innovation*. 4 ed. 1995, New York: The Free Press.
 31. Kling, R., *Learning About Information Technologies and Social Change: The Contribution of Social Informatics*. *Information Society*, 2000. **16**(3): p. 217-232.
 32. Damanpour, F. and M. Schneider, *Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers*. *British Journal of Management*, 2006. **17**(3): p. 215-236.
 33. Braa, J.r., E. Monteiro, and S. Sahay, *Networks of Action: Sustainability Health Information Systems Across Developing Countries* *MIS Quarterly*, 2004. **28**(3): p. 337-362.
 34. Krishna, S. and G. Walsham, *Implementing public information systems in developing countries: Learning from a success story*, in *Information Technology for Development*. 2005, Taylor & Francis Ltd. p. 123-140.
 35. Peppard, J. and J. Ward, *Beyond strategic information systems: towards an IS capability*. *The Journal of Strategic Information Systems*, 2004. **13**(2): p. 167-194.
 36. Markus, M.L. and C. Tanis, *The Enterprise System Experience - From Adoption to Success*, in *Framing the Domains of IT Management: Projecting the Future Through the Past*, R.W. Zmud, Editor. 2000, Pinnaflex Educational Resources, Inc.: Cicinnatti, OH. p. 173-207.
 37. Dooley, L.M., *Case Study Research and Theory Building*. *Advances in Developing Human Resources* 2002. **4**: p. 335-354.
 38. Yin, R.K., *The Case Study Crisis: Some Answers*. *Administrative science quarterly*, 1981. **26**(1): p. 58-65.
 39. Walsham, G., *Interpreting Case Studies in IS Research: Nature and Method*. *European Journal of Information Systems*, 1995. **4**: p. 74-81.
 40. Walsham, G., *Doing Interpretive Research*. *European Journal of Information Systems*, 2006. **15**(3): p. 320-330.
 41. Stockdale, R. and C. Standing, *An interpretive approach to evaluating information systems: A content, context, process framework*. *European Journal of Operational Research*, 2006. **173**(3): p. 1090-1102.
 42. Scheepers, R. and H. Scheepers, *Contexts of Relevance in Explanatory Case Studies in Information Systems: Ubiquitous Information Technology Implementation in Organizations*. *ICIS 2003 Proceedings*. Paper 3, 2003.
 43. Strauss, A. and J.M. Corbin, *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. 2 ed. 1998, California, USA: Sage Publications, Inc.
 44. Urquhart, C., H. Lehmann, and M.D. Myers, *Putting the 'theory' back into grounded theory: guidelines for grounded theory studies in information systems*. *Information Systems Journal*, 2010. **20**(4): p. 357-381.
 45. Kendall, J., *Axial Coding and the Grounded Theory Controversy*. *Western Journal of Nursing Research*, 1999. **21**(6): p. 743-757.
 46. Dwiyanto *Penerapan E-Government di Kabupaten Sragen*. 2009.
 47. Ven, A.H.V.d., et al., *Building an Infrastructure for Innovation Journey*, in *The Innovation Journey*, A.H.V.d. Ven, et al., Editors. 1999, Oxford University Press: New York. p. 421.
 48. Garud, R. and M.A. Rappa, *A Socio-cognitive Model of Technology Evolution: The Case of Cochlear Implants*. *Organization Science*, 1994. **5**(3): p. 344-362.
 49. Cook, M.E., et al. *Making a Case for Local E-Government*. *Center for Technology in Government 2002* [cited 2010 22 April]; Available from: [http://prof.incheon.ac.kr/~sjinwan/egov/chamgo/Making%20a%20case%20for%20e-Local Government.pdf](http://prof.incheon.ac.kr/~sjinwan/egov/chamgo/Making%20a%20case%20for%20e-Local%20Government.pdf).
 50. Ho, A.T.-K. and A.Y. Ni, *Explaining the Adoption of E-Government Features: A Case Study of IOWA County Treasurer's Offices*. *The American Review of Public Administration*, 2004. **34**(2): p. 164-180.
 51. Davis, L.E. and D.C. North, *Institutional Change and American Economic Growth*. 1971, London: Cambridge University Press.
 52. Chatterjee, D., R. Grewal, and V. Sambamurthy, *Shaping up for E-commerce: Institutional Enablers of the Organizational Assimilation of Web Technologies*. *MIS Quarterly*, 2002. **26**(2): p. 65-89.
 53. Aladwani, A.M., *Change Management Strategies for Successful ERP Implementation*. *Business Process Management*, 2001. **7**(1): p. 266-275.
 54. Myers, M., *Qualitative Research and The Generalizability 2000*, *The Qualitative Report*
 55. Schofiell, J.W., *The Qualitative Researcher's Companion*, A.M. Huberman and M.B. Miles, Editors. 2002, Sage Publications: London.

