Transformation of Shared Service Typology Arrangement using Watson ans Mundy's E-Government Framework

Ravika Hafizi  
*Universiti Teknologi Malaysia, hrvika2@live.utm.my*

Azizah Abdul Rahman  
*Universiti Teknologi Malaysia, azizahar@utm.my*

Suraya Miskon  
*Universiti Teknologi Malaysia, suraya@utm.my*

Nazmona Mat Ali  
*Universiti Teknologi Malaysia, nazmona@utm.my*

Norris Syed Abdullah  
*Universiti Teknologi Malaysia, norris@utm.my*

*See next page for additional authors*

Follow this and additional works at: [http://aisel.aisnet.org/pacis2017](http://aisel.aisnet.org/pacis2017)

**Recommended Citation**

[http://aisel.aisnet.org/pacis2017/232](http://aisel.aisnet.org/pacis2017/232)

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2017 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
Transformation of Shared Service Typology Arrangement using Watson and Mundy’s E-Government Framework

Completed Research Paper

Ravika Hafizi
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
hravika2@live.utm.my

Azizah Abdul Rahman
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
azizahar@utm.my

Suraya Miskon
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
suraya@utm.my

Nazmona Mat Ali
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
nazmona@utm.my

Norris Syed Abdullah
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
norris@utm.my

Sharin Hazlin Huspi
Faculty of Computing,
Universiti Teknologi Malaysia
Johor, Malaysia
sharin@utm.my

Abstract

This study aims to propose initial framework in transforming intra-organizational ICT shared service towards inter-organizational ICT shared service. This study conducted a single case study; the data was collected by using semi-structured interview sessions with several practitioners of current inter-organizational ICT shared service in e-government. After collecting and analyzing the data, RDT was used as the theory for a lens in identifying the dependencies of each of organizations involvement in inter-organizational ICT shared service. Based on the result of analyzing toward interviews findings and identifying through RDT, this study followed the stages of Watson and Mundy’s e-government framework. It aims to have full innovative restructuring of service implementation focusing on ICT shared service typology transformation from intra-organizational to be inter-organizational ICT shared service in e-government.

Keywords: Watson and Mundy’s framework, inter-organizational, ICT shared service, e-government, transformation
Introduction

Shared service is commonly used to remove the duplication of systems or activities within a large organization or different organizations. It helps to improve the performance of those organizations and minimize the costs (Gould and Magdieli 2007; Janssen and Joha 2006). Shared service is both applied in public and private organizations (Borman and Janssen 2008; Wagenaar 2006) which successfully influences the use of technology and economic. There are eight types of shared service typology in which each of those typology has different shared service arrangement and organizational involvement (Miskon et al. 2013).

Meanwhile, e-government helps to maximize the technology usage by connecting government with its citizens and its business partners (Watson and Mundy 2001). During the implementation of e-government, various challenges may exist such as operational duplication, limited funding, and lack of integration which will influence e-government’s performance (Belanger and Hiller 2006). To overcome those challenges, governments in developed countries such as in Australia and United States has been trying to implement shared service in their local, state, or national government since 1990s (Kearney 2005; Tomkinson 2007). There is a growing desire from many governments both in developing and developed countries to implement shared service. Majority of government’s respondent believe that implementing shared service in public sector such as e-government might support the organization to attain its strategic goals (Burns and Yeaton 2008; Deloitte 2005; Hafizi et al. 2014). Shared service implementation might help government whether for improving the quality of the service, increasing cost efficiency, improving decision making, or transferring knowledge and skills to its users. Implementation of shared service in government are usually derived from best practices of successful shared services in another government, as ICT shared service in government is still at its beginning state (Fielt et al. 2014).

There are many common resources and services in e-government which can be implemented as shared service. This study focuses on two types of shared service typology, namely intra-organizational ICT shared service and inter-organizational ICT shared service. Intra-organizational shared service is defined as a service being shared by multiple units within an organization in which it has no separate entity that overlooks the sharing arrangements (Miskon et al. 2013), while inter-organizational shared service is defined as a common service being shared by two or more related units in an organization which has no separate entity to manage the sharing arrangement; at the same time, that organization might share the service with the other organizations (Miskon et al. 2013). We found that there is opportunity for intra-organizational ICT shared service to be transformed into inter-organizational ICT shared service where the service can be expanded and be used by many organizations. Inter-organizational shared service is being popular to be used by many e-governments in developed countries (Hafizi et al. 2014). Early studies found that inter-organizational ICT shared service might provide benefits for the organizations especially for service improvement and cost saving (Janssen et al. 2009; Janssen et al. 2010; van Fenema et al. 2014). The outcome of inter-organizational ICT shared service derives from the involvement of all organizations in collaborating and cooperating toward decision making.

However, there is no appropriate guideline on how to implement it, although there is a lot of potential to share the services and resources especially in the developing countries. Further intensified by the pressure from today’s economic crisis, the use of shared service will be sought by numerous organizations to reduce the ICT costs significantly. Hence, there is a need to assess the current ICT services for identifying the potential ICT services to be shared within or among organizations. For instance, a particular inter-organizational ICT shared service in e-government can be formed as complex arrangement that allows the organization/ministry to share its common services between its units and other organizations/ministries. There is a need to fully concern on current situation and find a way to upgrade the use of service from intra-organizational to be inter-organizational ICT shared service since there are many benefits can be achieved.

Related Works

Inter-Organizational ICT Shared Service Transformation

Transformation of an e-government is expected able to enhance the value of services received by citizen, business partners, and other related organizations. It may also increase the satisfaction, effectiveness, and efficiency level of e-government service. The existence of ICT shared service in e-government is increasing nowadays. Departments or units of a government may cross their
boundaries in order to use common services that able to reduce their cost of developing or owning the services. However, moving to inter-organizational ICT shared service is not easy task to do. Organization needs to know the appropriate way to transform the service by identifying cross-functional collaboration between those organizations. By transforming the use of ICT shared service, it may remove organizational process, technology, and barriers in achieving more significant payoffs. Identifying how inter-organizational ICT shared service transform through an initial framework may help in identifying challenges in building commitments and capabilities to successfully promote ICT shared service transformation.

**E-Government Transformation Framework by Previous Researchers**

Most of e-governments performed transformation because of challenges in advancing the usage of ICT and the growth of Internet as prerequisite to fit into new trend of better e-government service (Al-Khouri 2011). Government needs to transform from traditional department centric to a citizen centric model to enable them to deliver the services successfully. E-government framework could have certainly added value on how to develop the e-government. A comprehensive and well-designed framework might save a lot of time and money during the implementation of it. Previous researchers have used various e-government transformation/development frameworks; Table 1 shows some of the stages of those frameworks:

<table>
<thead>
<tr>
<th>Authors</th>
<th>Stages in E-Government Development/Transformation Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deloitte (2000)</td>
<td>i) information publishing/dissemination in which government posts information in website; \</td>
</tr>
<tr>
<td></td>
<td>ii) official two-way transactions where the citizens can communicate with government; \</td>
</tr>
<tr>
<td></td>
<td>iii) multi-purpose portals; iv) portal personalization; v) clustering of common services allows government services are \</td>
</tr>
<tr>
<td></td>
<td>integrated because of common services; vi) full integration and enterprise transformation.</td>
</tr>
<tr>
<td>Howard (2001)</td>
<td>i) information publishing in which government posts information in website; \</td>
</tr>
<tr>
<td></td>
<td>ii) two ways communication, in the second stage the citizens can communicate with government by sending a simple request \</td>
</tr>
<tr>
<td></td>
<td>through email; iii) transaction stage where e-government has been established to accommodate processing of transactions; \</td>
</tr>
<tr>
<td></td>
<td>iv) integration allows government services are integrated together by establishing single portal entry service.</td>
</tr>
<tr>
<td>Lau (2001)</td>
<td>i) information is where the government posts information in the website; \</td>
</tr>
<tr>
<td></td>
<td>ii) communication is the stage where government allows the communication with citizens through email; \</td>
</tr>
<tr>
<td></td>
<td>iii) transaction stage allows citizens to do online transactions with government; iv) integration stages where all the services |</td>
</tr>
<tr>
<td></td>
<td>are integrated using single portal across all agencies.</td>
</tr>
<tr>
<td>Hiller and Belanger (2001)</td>
<td>i) one-way communication consists of static web site providing information from government; ii) two-way communication \</td>
</tr>
<tr>
<td></td>
<td>where the citizens can communicate with government by sending a simple request; iii) complex transactions which allows online |</td>
</tr>
<tr>
<td></td>
<td>transaction; iv) integration across government administration.</td>
</tr>
<tr>
<td>Elmagarmid and Melver (2001)</td>
<td>i) catalogue which consists of static web site; ii) transaction stage that allows online transactions done by the citizens; \</td>
</tr>
<tr>
<td></td>
<td>iii) vertical integration stage is the process where central government integrate its service to local departments; iv)</td>
</tr>
<tr>
<td></td>
<td>horizontal integration is the last stage where departments of government across different levels of government are integrated.</td>
</tr>
<tr>
<td>Layne and Lee (2001)</td>
<td>i) initiation stage is single point of access government information; ii) infusion stage where almost all governments units adopted |</td>
</tr>
<tr>
<td></td>
<td>e-government principles; iii) customization is where a one-to-one relationship is implemented.</td>
</tr>
<tr>
<td>Watson and Mundy (2001)</td>
<td>i) information stage enables government give information to the citizens through website; ii) communication stage which supports |</td>
</tr>
<tr>
<td></td>
<td>two-way communication; iii) transaction stage which allows online transaction between citizens and government and \</td>
</tr>
<tr>
<td></td>
<td>inter-governmental transaction; iv) transformation stage allows practices and services delivered are transformed through changes |</td>
</tr>
<tr>
<td></td>
<td>to the government processes and structures.</td>
</tr>
<tr>
<td>Chen (2003)</td>
<td>i) publish stage which involves publishing the government information online for the citizens; \</td>
</tr>
<tr>
<td></td>
<td>ii) interact stage that allows two ways communication between government and its citizen; iii) transact stage that allows the |</td>
</tr>
<tr>
<td></td>
<td>citizens to do online transactions.</td>
</tr>
<tr>
<td>De Kleine et al. (2002)</td>
<td>i) information stage enables government give information to the citizens through website; ii) communication stage which supports |</td>
</tr>
<tr>
<td></td>
<td>two-way communication; iii) transaction stage which allows online transaction between citizens and government and \</td>
</tr>
<tr>
<td></td>
<td>inter-governmental transaction; iv) transformation stage allows practices and services delivered are transformed through changes</td>
</tr>
<tr>
<td></td>
<td>to the government processes and structures.</td>
</tr>
</tbody>
</table>
Ronaghan (2002)

i) emerging stage where the government web presence is established; ii) enhanced stage allows content and information are being updated regularly; iii) interactive stage allows the citizens can download forms and make requests to the government; iv) transactional stage allows citizens to make online payment transaction; v) seamless is the last stage where total integration across administrative and departmental is done.

Baum and Maio (2000)

i) web presence where there is static webpage for displaying information; ii) interaction enables government to interact with its citizens via internet in which it more focuses on improving the form of e-government; iii) transaction enable the citizens to perform transactions online; iv) transformation requires the government to engage the use of e-government by designing new form of government.

Belanger and Hiller (2006)

i) information stage is where the government posts information in the website. It is the simplest form of e-government as it is the initial once the e-government established; ii) two-ways communication is the stage where government allows the communication for requesting through email; iii) transaction stage allows citizens to do online transactions with government; iv) integration stages where all the services are integrated using single portal across all agencies; v) participation stage where allows the citizens to participate online in e-government service such as voting online, registration online.

Hanna (2010)

i) web presence/information dissemination consists information on rules and procedures; ii) limited interactions stage which allows the citizens to communicate with government through email, the citizens also allow to access online database or downloaded forms; iii) integrated government stage allows the citizens to use electronic delivery of service automated such as license renewal; iv) transformation is the last stage where all transactions are done electronically.

Table 1. Previous Studies of E-Government Development/Transformation Framework

All frameworks mentioned in Table 1 show the development of e-government until all the departments are integrated without having particular stages on how to optimize/personalize the service later. Meanwhile, to implement the inter-organizational ICT shared service, the service provider needs to consider the customization/next evolution of the service so that all stakeholders involved will keep using the service (McIvor et al. 2011). Therefore, we decided to implement the stages of Watson and Mundy’s E-Government framework (Watson and Mundy 2001) due to its suitability for organization to test the feasibility of the service. It also allows organizations to have full innovation restructuring of service change for all of stakeholders involved. It is precisely tailored to the needs of end users and other stakeholders; in which any improvement needs to be done continuously. The stages of Watson and Mundy’s framework are i) initiation; ii) infusion; iii) customization. The explanation of the use of Watson and Mundy’s framework as explained in the next section.

Watson and Mundy’s E-Government Framework

Watson and Mundy (2001) developed a framework to identify strategy for implementing e-democracy. They described the state of e-government deployment and develop a plan for future development. This framework implies the bigger opportunities for the users to fulfill their needs by choosing the service provided electronically as well as having a voice to articulate their preferences. Watson and Mundy proposed three stages model of the e-government development. These three stages are initiation stage, infusion stage and customization stage. Initiation stage is aimed to develop the infrastructure, acquint with the concept, and learn how to scale the services. In Watson and Mundy’s case study, it provided a single point of access government information. The government tried to reduce government transactions cost and to improve the service by creating more informed citizens. Infusion stage is where the basis of skills and knowledge has been built, the idea for the e-government development has grown, and large scale e-government adoption is feasible. In Watson and Mundy's case study, the government used application service for small government organizations, the transparency of government operation and open access to government is increased. In infusion stage, almost all governments units adopted the principles of e-government. Customization stage is aimed for fulfilling the satisfaction of users following the trend. In Watson and Mundy’s case study, customization stage was the stage where e-democracy as a one-to-one relationship is implemented between government and its citizens. It developed personal portals for government, and citizens can customize information of relevance through personal profiles.

There are a number of previous studies of e-government sector which also applied Watson and Mundy’s Framework: Ke and Wei (2004) used Watson and Mundy’s framework to identify
Singapore’s e-government stages of development. In the initiation stage, Singapore provided single point of access the government service, it started to give the information for citizens about the use of e-government. In initiation stage, few online transactions had been established. During the infusion stage, the government found major problems included to transform civil servants' mindset, ambiguity of e-government goals, lack of financial resources, and lack of technical capability. To tackle those problems, they issued action plan which consists of strategic plan and guideline to be followed in e-government, built strong support of policy committee involve, chose centralized funding to better monitor and manage the e-government, and they had common infrastructure which can be used by all citizens. In infusion stage, the government successfully implemented all government ministries and agencies in Singapore to use e-government. They also started to encourage the citizens to use the e-services. After all ministries had implemented the principle of e-government, it needed to maximize the value of e-government for citizens. Singapore decided to collaborate and share information of across departments/agencies to provide integrated services for the citizens. They did collaborative learning and share knowledge by having meetings, gatherings, and forums so that the knowledge and best practices of service implementation could be shared across departments/agencies. Meanwhile, Gorla (2008) used Watson and Mundy’s framework as design dimension and collaborated it with Infodev’s e-government by De Kleine et al. (2002). That framework was used to identify recommendations list for doing successful execution of rural e-government project. S/he used ten rural e-governments and mapped into stage of Watson and Mundy’s framework. Then, s/he analyzed each of those rural e-governments through the economic, personnel, and operational hurdles faced in implementing each of them. S/he found that three e-government were in infusion stage since those e-government already used various equipment using different technologies and provided information to public. While others e-government were categorized in customization stage because they had interaction and online transaction with the public. Through identification of those services, s/he came out with some suggestions to increase the use of those e-government services.

<table>
<thead>
<tr>
<th>Stages in Watson and Mundy’s Framework</th>
<th>Initiation</th>
<th>Infusion</th>
<th>Customization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watson and Mundy (2001)</td>
<td>Single point of access government information</td>
<td>Almost all governments units adopted e-government principles</td>
<td>E-democracy as a one-to-one relationship is implemented</td>
</tr>
<tr>
<td>Ke and Wei (2004)</td>
<td>Provided few online transactions</td>
<td>All government’s agencies used e-government separately</td>
<td>All government’s agencies collaborate as one government (shared across agencies through meetings, forums, and gatherings)</td>
</tr>
<tr>
<td>Gorla (2008)</td>
<td>-</td>
<td>Provide various equipment through different technologies</td>
<td>Had transaction and interaction between government and public through e-government</td>
</tr>
</tbody>
</table>

Table 2. Previous Studies Implemented Watson and Mundy’s Framework

Those previous studies were not in shared service area; but successful usage of Watson and Mundy’s framework for identifying e-government transformation gives an opportunity for this study to implement Watson and Mundy’s framework as well. By identifying previous studies which use Watson and Mundy’s e-government framework; identification toward the possibility of applying Watson and Mundy’s e-government framework for inter-organizational ICT shared service transformation in e-government then will be done. It is suitable to be used for improving the usage of e-government service for current study because i) at the initiation stage, it allows an organization to test the feasibility of the service innovation. It allows the organization to identify the ‘know-what’ of the service and organization involved by building the foundation of skills and knowledge about the service. Usually, there exists a simple portal of e-government at this stage; ii) at the infusion stage is where the process of ‘know-how and know-why’ is done. The organizations involved are restructuring the service as requirements. In infusion stage, the full innovation of service change is done by all of stakeholders involved; iii) at the customization stage is where the provider needs to identify ‘care-why’ of the service and other stakeholders. In customization stage, the service is precisely tailored to the needs of end users and other stakeholders, any improvement needs to be done continuously. Research method will be presented in the next section. It is followed by result and discussion of the study. Last section will provide conclusion as well as recommendation for the future study.
Research Method

This study aims to understand a gap: how to transform intra-organizational ICT shared service into inter-organizational ICT shared service in e-government? This paper contributes to propose initial framework in building on and expanding the stages of Watson and Mundy’s e-government framework for transforming intra-organizational ICT shared service to be inter-organizational ICT shared service. Single case study was conducted by using semi-structured interviews with the practitioners of current inter-organizational ICT shared service. The respondent of this case study consists of manager, IT officer, representatives of other organizations who used the service. A case study protocol was developed and sent to the targeted interviewees. Case study protocol consisted of all procedures related to the data collection and data analysis of the study. The interview sessions took 45 – 120 minutes and were conducted at the interviewees’ workplace. The results of interview sessions were then transcribed and analyzed.

During analyzing the finding, the authors used theory as a lens in mapping the interviews’ findings with the current situation of inter-organizational ICT shared service transformation using Watson and Mundy’s framework. Resource Dependence Theory (RDT) was decided to be used because it focuses on the resources, strategic, role, and external constraints of an organization’s dependence (Borman 2010). RDT provides an overall lens for the study about dependencies between organizations. RDT can be used to know the motivation of joining inter-organizational ICT shared service and help in managing the dependencies between provider and other stakeholders focusing on internal as well as external constraints of organization’s dependence.

Result and Discussion

Case Study: ICT Shared Service Transformation of Service M

Public universities are the example of public sector organizations that were challenged by the emerging of higher education market. Current situation requires public sector including public universities to minimize cost but at the same time improve the knowledge, skills, staffs’ capability and decision making. This study will use the case study in developing country in which ICT shared service is conducted among public universities under Ministry of Higher Education. The service is managed by one public university and being shared with another public university in that country. We use pseudonyms Service M managed by University T. Previously, Service M started as a self-access learning platform for the students in University T. Every student from various departments of University T used Service M as one common service. This type of service sharing is classified as intra-organizational ICT shared service because there was no separate shared service unit that organizes the arrangements in a university. Successful of Service M implementation in University T attracted Ministry of Higher Education to outspread it to be used by another public university. Then, this service is fully funded by Ministry of Higher Education while the development, maintenance, and host is done by University T. Other public universities which join Service M need to have their representatives to help University T to monitor the sharing of service in their respective universities. Service M allows students from those public universities to access the service freely. The students from a public university might interact online and share knowledge with other students from another university. This type of sharing is classified as inter-organizational ICT shared service in which one organization (University T) has better experiences and knowledge might share Service M to other public universities. Those public universities including University T do collaboration in decision making of the usage of Service M, while remaining competitors on another (Yee 2009). As one of successful implementation case study of inter-organizational ICT shared service from intra-organizational ICT shared service, we would like to identify the suitable way organizations can follow to transform their current intra-organizational ICT shared service to be inter-organizational ICT shared service based on best practice of Service M case study. Figure 1 illustrates the situation of Service M transformation from intra-organizational ICT shared service to be inter-organizational ICT shared service.
To transform the use of ICT shared service of Service M from intra-organizational to inter-organizational ICT shared service, this study followed the stages as Watson and Mundy’s e-government framework suggested, which are: i) initiation stage ii) infusion stage iii) customization stage. Table 3 presents tasks in each stage of Watson and Mundy’s framework and its implementation for Service M case study.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Implementation of Watson and Mundy’s Framework for Service M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>i) Intra-organizational ICT shared service has been existed</td>
</tr>
<tr>
<td></td>
<td>ii) The use of preliminary decision diagrams to decide the readiness of organizations to do transformation</td>
</tr>
<tr>
<td>Infusion</td>
<td>Other public universities adopt and use inter-organizational ICT shared service</td>
</tr>
<tr>
<td>Customization</td>
<td>Service improvement to maximize value of inter-organizational ICT shared service</td>
</tr>
</tbody>
</table>

Table 3. The Implementation of Watson and Mundy’s E-Government Framework for Service M Case Study

**Initiation Stage**

Initiation is the first stage where an intra-organizational ICT shared service has existed. It is the initiation of Service M to transform the ICT shared service from intra-organizational ICT shared service to inter-organizational ICT shared service. Initiation stage is used to create the infrastructure of e-government service improvement. This is the first step for the organization to decide whether they are ready for the next level or not. The concept is used to acquaint and learn how to scale the services. ICT shared service provider (University T), other public universities, and ministry of higher education start to define its objectives, scope, and purpose of joining the service. For Service M case, preliminary decision diagrams are used to determine two point in initiation stage, a) the use of preliminary decision diagram to decide whether the service provider is ready to transform from intra-organizational ICT shared service to be inter-organizational ICT shared service. This preliminary decision diagram for service provider might seek the readiness of: i) Service M capability itself to be used by many users ii) capability of provider (human resources, technology, willingness, knowledge) to expand and manage the service iii) procedures to be followed during ICT shared service implementation iv) provider’s liaison with ministry and other public universities. Another point to be determined in initiation stage is b) the use of preliminary decision diagram to decide whether other public universities are ready to join inter-organizational ICT shared service in e-
government. The chosen of questions for each of steps in preliminary decision diagrams should be based on some reasons and background, the justification for each of questions in preliminary decision diagrams is needed. At the end, there will be a result of decision whether University T and other public universities have potential to implement inter-organizational ICT shared service or not.

**Infusion Stage**

There are some problems will be highlighted in Service M transformation during this stage; such as the need to transform the mindset of representatives, the ambiguity of inter-organizational ICT shared service goals for each of stakeholders, lack of technical capabilities, and financial resources. Service M is success in tackling these problems may be attributed by strong leadership of University T in planning the strategic action plan: i) ensuring inter-organizational ICT shared service has conceptualize action plan to set out all stakeholders ii) providing strong support for all other public universities to ensure the program objectives become a reality with enough fund. Infusion stage is the most complicated stage during the transformation of inter-organizational ICT shared service in e-government.

Borman (2010) applied RDT in the study to identify the motivation of shared services partnerships in local government level. Borman found that the effectiveness of using shared service might be influenced by resources and relationships of the organizations involved in managing their dependencies. RDT might show the organizations’ dependence to survive where the power goes to those who control the resources (Pfeffer and Salancik 2015). The organization who control the resources classified as independent organization which becomes the center of information network and builds allies with others (Pfeffer 2013). By using RDT, the relationships within organization and/or between organizations can be studied. It shows the dependence of organizations toward other organizations in fulfilling their needs. For this study, other public universities (for example public university A) depend on University T to fulfill their needs toward Service M.

In inter-organizational ICT shared service, there are dependencies between organizations involved, there is a need to diagnose how critical resources are being accessed, understand coordination service and cost in the dependencies, and visualize power and control across resource exchanges. For Service M case study, those elements were identified using Dependence Network Diagram (DND) factors consist of i) activity ii) resource iii) role iv) goal v) dependency vi) governance control. DND had been used by Tillquist et al. (2002) to enable a better understanding toward organizational relationship and present the coordination in controlling organizational work. DND enables the crucial elements in organizational relationships to be seized, linked, and evaluated under varying conditions. Montazemi et al. (2009) used DND for informing social network analysis structural approach focuses on the structure of relationships between subject and object actors, and Borman and Ulbrich (2011) used DND to determine the dependencies by examining inter-organizational alliances and offer guidance toward the structure and management. Table 4 shows constructs of DND and its definition.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Procedure is used to deliver the material or informational resources necessary for the service.</td>
</tr>
<tr>
<td>Resource</td>
<td>Anything such as information and material that valuable for the role</td>
</tr>
<tr>
<td>Goal</td>
<td>Specifies the objectives to be achieved</td>
</tr>
<tr>
<td>Role</td>
<td>It represents individuals, organizations, or work groups who are sharing common goals and activities</td>
</tr>
<tr>
<td>Governance Control</td>
<td>A ruling for acceptable actions to fulfil a dependency</td>
</tr>
<tr>
<td>Dependency</td>
<td>Defines the need of one role over the action of other roles to achieve a goal. It defines uniqueness of dependency representation</td>
</tr>
</tbody>
</table>

**Table 4. DND Constructs**

During the infusion stages of Service M, the stakeholders need to consider those DND constructs to determine the dependencies of all stakeholders involved i) Identify all the activities in transforming from intra-organizational to be inter-organizational, and activities during implementation shared service as inter-organizational ICT shared service; ii) Identify the resources used for the transformation of intra-organizational ICT shared service to be inter-organizational ICT shared service, and the resources during the implementation of inter-organizational ICT shared service.
Those resources might identify as the source of fund, the source of information include in the service, and infrastructures resources for the service; iii) Goal construct is used to identify the objectives of transformation and objectives of each of roles in using shared service e-government. It needs to identify what the stakeholders want to achieve during use the service M; iv) Identify every role such as the people who assigned to manage the service both on as provider and the public universities’ representatives; v) Governance control is used to identify the acceptable action in fulfilling a dependency between the organizations. In Service M, Ministry is taking care of the governance control since Service M is funded and controlled by them; vi) Dependency construct identifies the dependence representation between organizations in the case study. Since Service M is developed by University T, it needs to identify the dependency happened between University T, other public universities, Ministry, and end users; and how they fulfill those dependencies. Figure 2 shows the network of stakeholders’ dependencies of Service M.

**Customization Stage**

Customization stage is used to maximize the value of inter-organizational ICT shared service for all stakeholders. It is done when all stakeholders have been joining inter-organizational ICT shared service. The changing conditions during the use of inter-organizational ICT shared service by all stakeholders might happen. As Tillquist et al. (2002) identified that, the dependency changing which identified through DND might be modelling emphasizes depictions of i) the context in which those stakeholders operate ii) the roles involved in the exchange relation, and iii) the activities needed to acquire critical resources. To attain the goal, University T as inter-organizational ICT shared service provider focused on, first, i) the context in which the service is being shared. It needs for both provider and other public universities to maintain the use of shared service by attaining the goal to improve the service capability, and develop new variety of service might help the end users to keep using the service; ii) every stakeholder including their staffs involved in inter-organizational ICT shared service plays important roles. It needs to make sure that those people keep updating with the latest
information of service provided; iii) the activities by focusing on the processes during the use of inter-organizational ICT shared service by all stakeholders; it needs to tackle the problems happened during the service usage and reengineering of service delivery to fulfill stakeholders’ needs. It needs for the other public universities which join inter-organizational ICT shared service to still have their unique values as independent organization beside their dependencies toward Service M. In customization stage, there is opportunity for other potential organizations to join and use the service too. In Service M case study, those other potential organizations might be private universities, schools, or any other organizations which need the service. The arrangement of service usage might be based on service subscription.

All those three stages are mapped in Figure 3 in appendix to shows those stages in the initial framework of inter-organizational ICT shared service transformation using Watson and Mundy’s e-government framework.

Conclusion

Transformation of ICT shared service in e-government services is expected to enhance the value of services received by citizen, business partners, and other organizations related. It may increase the satisfaction, efficiency, and effectiveness level of e-government service. As this study focused on two types of shared service typology which are intra-organizational and inter-organizational ICT shared service, it might help an organization to broaden the scope of ICT shared service utilization by many organizations. This paper proposed an initial framework in building on and expanding the stages of Watson and Mundy’s E-Government framework for inter-organizational ICT shared service transformation. First, it identified the most suitable e-government transformation framework as the basis framework to be used through previous researchers who used various e-government transformation/development framework. Next step, we mapped the situation of ICT shared service transformation into Watson and Mundy’s framework. As the result, an initial framework for transforming intra-organizational ICT shared service to be inter-organizational ICT shared service in e-government using Watson and Mundy’s e-government framework is proposed. As this study only used single case study, future study suggests cross case studies of inter-organizational ICT shared service implementation in e-government to be conducted for more generalizable framework.

Acknowledgement

The authors would like to thank the Ministry of Higher Education (MOHE) and the Universiti Teknologi Malaysia (UTM) for the Research University Grant Scheme (GUP) (vote number: 12J27) that had supported this research.

References


Twenty First Pacific Asia Conference on Information Systems, Langkawi 2017


Figure 3. Inter-Organizational ICT Shared Service Transformation Initial Framework using Watson and Mundy's E-Government