

Information Sharing Model among State Agencies in Malaysia: A Case Study

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Abstract

Information-sharing projects are becoming increasingly important in state agencies. Generally, organizations base their decision to move forward with an information-sharing project on the project's expected benefits such as better services, operational savings, and increased program effectiveness. In Malaysia, currently, there is insufficient information about the current practices, states or level maturity, requirements, models adopted in relation to information sharing for the e-services' implementation among the government agencies. The paper explores the various dimension and stages of government information sharing in the context of Malaysia e- Government by using a framework of Government Information sharing framework adopted from the Estevez, Fillottrani, and Janowski. In this study, An exploratory case study was used to identify problems and collect data in this study. The study results show that environmental, inter-organization, organization and technological dimension influence information sharing within state agencies. It is also shown that *waqf* system is in Stage 1 (experience sharing). An extensive set of recommendations is put forth to enable state agency to move from Stage 1 to Stage 2.

Keywords : Government information sharing Framework, Information Sharing, E-Government, State agencies

1. Introduction

In the last decade (1995-2005), efforts were undertaken by the government to provide a stronger platform for the country's transition towards a knowledge-based society, (Eight Malaysian Plan, 2000-2005), (Ninth Malaysian Plan, 2006-2010). The implementation of e-government in Malaysia began with the introduction of Malaysia Super Corridor (MSC) where the electronic government was one of these seven flagships introduced by the government in 1996 [17]. The Electronic Government (e-Government) refers to the use of Information and Communication Technology (ICT), particularly the internet, as a means to achieve better government [8]. The electronic government also refers to government's use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities. In the electronic government environment, the need for cooperation and sharing of information is very important because the government is trying to provide better services using limited resources. Electronic government services promised improving efficiency, cost reduction and improving public services [16]. There are needs to share information and integrate not only in the different layers of government agencies but also among government institutions with different purposes. Information Sharing is the fundamental objective of the information system and has long been considered as an important approach for increasing organizational efficiency and

performance. It is about an exchanging information within and across department agencies or otherwise giving them access to information [3].

In order to provide a better delivery of e-government services, guides should be given to support agencies in sharing information within an agency, between agencies, or among agencies. Good practices in information sharing among the state government's agencies should be adopted. In Malaysia, currently, there is insufficient information about the current practices, states or level maturity, requirements, models adopted in relation to information sharing for the e-services' implementation among the government agencies. It is, therefore, to fill in the gap of existing literature knowledge on information sharing practices in Malaysia, a study has been conducted to explore the scenario of information sharing among Malaysia states' agencies in delivering e-Government services to customers. This study aim to addresses the following question: What are the practices and stages of information sharing among the state agencies in delivering e-Government services? The scope of this study is on information sharing practices between Waqf department in one of the state agency with another state agencies.

2. Previous Studies

In Malaysia, several studies have been conducted in relation to e-government services and information sharing. The study on information sharing was conducted by [11]. The study proposed a conceptual framework that highlights individual, organizational and

technological as the three factors that contribute to the success or failure of information sharing practice among departmental in Malaysian electronic government agencies. [2]found that benefits, cost, complexity and compatibility affect the electronic interaction between local agencies in developing countries.[13]also proposed an integrated conceptual framework that highlighted two capable factors such as technical factor and non-technical factor in knowledge sharing within electronic government agencies in Malaysia.[10]revealed the factors that influence intention to use e-government services in Malaysia found that trust, perceived usefulness, perceived relative advantage, and perceive image had a significant effect.

The theoretical framework and the methodology of this research have been built based on the previous studies of electronic information sharing.

2.1 Theoretical Framework

The framework of this study was adopted from Government Information Sharing Framework (GISF) presented by [8]. The GISF was likewise selected because of its ability to address the objectives of this study. The model comprises of two views: GISF Abstract View and GISF Detailed View. The Abstract View presents four rows representing dimensions and three columns representing maturity stages, as depicted in Figure 1. Dimension layouts four aspects; (i) technological, (ii) organizational, (iii) inter-

organizational, and (iv) environmental while three stages of maturity in GIS are (i) Sharing Experience, (ii) Infrastructure Support, and (iii) Information Strategy.

Stage 1- Experience Sharing

The first stage refers to the concepts that should be considered in the early stages of government information sharing, serving to lay the foundations for government information sharing. Under environmental dimension, the component includes a benefit, and risk while scope belongs to Inter-organizational dimension, roles under Technological and Unit, and data components are under Technological dimension.

Stage 2- Infrastructure Support

Stage 2 talks about the concepts referring to the shared components accessible to the whole public administration, like laws and regulations under Environmental dimension, partnership trust under Inter-organizational dimension, process people under Organizational dimension and standards attributes including infrastructure components under Technological dimension.

Stage 3- Information Strategy

Refers to the concepts defining the information sharing environment of strategy engagement, governance community, capacity building function, and about repositories under Technological dimension.

CONCEPTS		MATURITY STAGES		
		Experience sharing	Infrastructure support	Information strategy
DIMENSIONS	Environmental	Benefit ,risks	Laws regulations	Strategy engagement
	Inter-Organizational	Scope	Partnerships trust	Governance community
	Organizational	Roles	Processes people	Capacity-building function
	Technological	Unit Data components	Standards Attributes	Repositories ontologies

Figure 1:. Government Information Sharing Framework-Abstract View [8]

The previous studies have reported two main theoretical models underpinnings Government Information Sharing (GIS) that have the most influence in the works of information sharing. Dawes’s model [6](Figure 2) presents information sharing as a

learning cycle of government agencies, that is triggered by a particular problem for an IS-based solution. It highlights the benefits and risks experienced by participants and sharing experiences as shaped by policy and management frameworks.

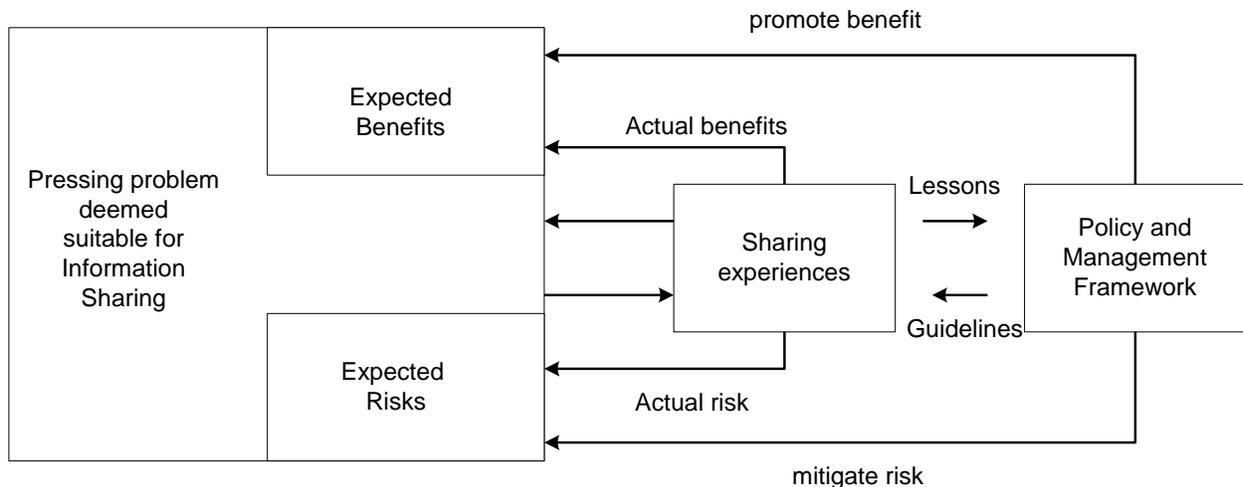


Figure 2: Theoretical model of interagency information sharing Dawes's Model [6]

[9] have expanded Dawes's model by focusing on Information Sharing in a networked environment or multiple agencies. They proposed a kind of interoperability model (Figure 3) for agencies into three stages. Stage 1, as in Dawes's model, reflects the experiences of individual agencies that share information. Stage 2 is the result of Stage 1, as experiences are built up by individual agencies. It consists of Technical, Interoperability Policy Architecture, and Institutional. Finally, Stage 3 benefits from the

lesson learned of the architecture/infrastructure, it synthesizes legal, managerial, and policy approaches to interoperability and Information sharing. Landsbergen and Wolken focused on understanding the experiences and viewpoints of technologically advanced government agencies rather than government agency itself, which may be relatively unfamiliar with technology and/or lack the requisite know-how to implement and maintain the complex system[1].

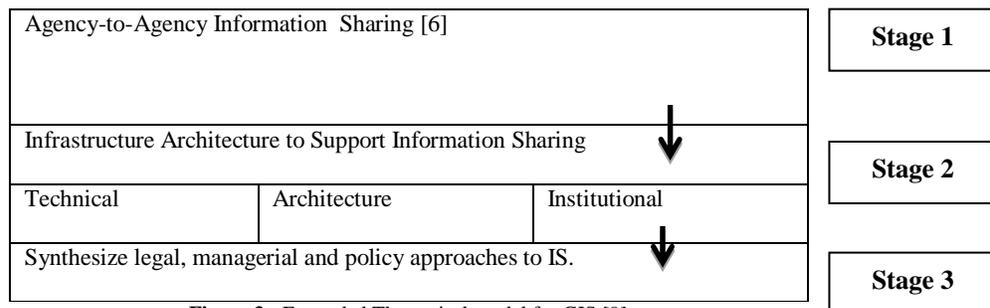


Figure 3: Expanded Theoretical model for GIS [9]

3. Methodology

Since this study focuses on exploring a new phenomenon in government agencies, which have limited literature to be referred to, it decided to adopt a case study approach. A case study methodology is an appropriate approach for the exploration, classification, and hypothesis development stages of the knowledge building process ([1]; [3]; [14]; [18], [19]; [20]; [21]; [22]). This study used the qualitative method in order to have a deeper understanding of the research problem more completely. Qualitative data are collected through semi-structured interviews with the key actors from local government who participated in the related initiatives. The interview questions are about the information sharing practices between and among agencies. This would include questions about the dimension and maturity stages of Information sharing. The areas will reveal the type or dimension focused by the state agencies; either at technological, organizational, inter-organizational or environmental. In achieving this objective, the GIS Framework introduced by [8] was applied. The instruments used for the interviews were based on their previous works, which focus on four (4) dimensions and three (3) stages of information sharing.

3.1 Case Study

In this study, the case study selected is the *Waqf* Department of an Islamic Religious Council in one state in Malaysia. The objectives of this case study are (i) to explore the current practices of organization information sharing in the department and (ii) to identify the information system requirements for *Waqf* management. In this study, respondents were selected based on the job function in the *Waqf* Department which include Applications and Land Acquisition Unit, *Waqf* Unit, Records and Tax Unit, and Technical Unit and Rent. In total, five participants were interviewed from a different unit in *Waqf* department. The average duration of the interviews was about two hours. In-depth and semi-structured interviews were used to collect data for analysis. The data collected from the study have been analyzed by using Atlas.ti qualitative analysis software and analyzed by applying content analysis techniques.

4. Results

This article focuses the findings of different dimensions and stages of information sharing practices in the case study based on Estevez et al.'s Government Information Sharing framework. Each of

dimension was classified into three stages namely (i) Stage 1- Experience sharing, (ii) Stage 2 - Infrastructure support, and (iii) Stage 3 - Information strategy. Stage 1 is the concepts that should be considered in the early stage of government information sharing (GIS) and serving as the foundation for GIS. Stage 2 refers to concepts that define the components that are accessible to the whole

public administration like infrastructure and facilities to support information sharing. Furthermore, stage 3 is the concepts that define, enable and maintain the GIS environment . The following describes the findings from the case study according to the three stages and four dimensions of GISF.

STAGE 1: Experience Sharing

The first stage highlights information about the foundation of GIS including the benefits, barrier, and risk involved in the information sharing practices (Table 1)

Table 1: Stage 1- Experience Sharing

DIMENSIONS	MATURITY STAGES
	Stage 1- Experience Sharing
Environmental	stewardship, benefit, barrier, usefulness
Inter-organizational	vertical , horizontal scope, benefit
Organizational	human resource and finance barrier
Technological	technical barrier, lifecycle, unit, data component

Environmental dimension

Under the environmental dimension, factors that influence the information sharing practices are a barrier, benefits, stewardship, and usefulness.

Barrier

There are four types of a barrier such as Technical, organizational, inter-organizational and environment. The technical barrier refers to

the hardware and software incompatibility to support information sharing. The organizational barrier refers to the lack of human and institutional capacity for Government information sharing. Meanwhile, inter-Organizational barrier refers to any barrier that requires the involve of several organizations to provide a solution [8]. Furthermore, Environmental barrier refers to the government system for support government information sharing implementation. Table 2 lists the barriers information.

Table 2: Barriers

Types	Barriers
Technical	Using a manual system to manage all the waqf functions. Could cause issues in updating and sharing information within the department or outside the department.
Organizational	Human resource aspect - Insufficient employees in the Waqf Department to handle the increasing of waqf information.
	Financial aspect- The Waqf Department has limited budget handle projects related to waqf management including a new system development. In addition, the financial resources are depending only on the budget allocated or money generated from waqf
Inter-organizational	Handling communication with external agencies. Need a proper standard of procedure.

Benefit

There are four types of benefits such as Technical, Organizational, Inter-organizational and environmental [8]. Technical benefit refers to a benefit that improves the efficiency of data processing and information management in information sharing [5]. Organizational refers to benefit that related to solutions of wide organization problems or the improvement of organizational capabilities [5]. Inter-organizational refers to benefit that was received by more than one organizations such as broadened collaboration networks [8]. Environmental refers to benefit that related to assisting the public administration in delivering better governance such as enhanced public images or public value created through information sharing [5]; [8]. In the study, it was found that one of the major reasons for the lack of perceived benefits was related to the problems with the current system. In the agency, manual record keeping is used. Therefore, it is difficult to handle many data and that slowed down the data processing. Some benefit was discussed here if Waqf department has on-line Waqf system.

In term of **technical benefit**, the department will have technical and organizational benefits once the integrated and collaborative methods are developed. Execution of processes for service delivery will be more effective and provide a good impact on the way agency operate [5]. Furthermore, communication will be improved between local agencies [4].

In **Inter-organizational Benefit**, Complexity and inconsistencies of processing in the agency will be reduced through the elimination of

duplicate processes. Communication between government agencies also will be improved through electronic information sharing [5]. For example, waqf application processing will be more effective and efficient if communication between Waqf department and Land department using the online system.

Meanwhile, **Organizational Benefit** offer cost reduction which is a desirable benefit for the agency [5]. The agency also can make improvement in terms of punctuality, consistency, and quality of responses to the clients. Data processing will be more effective and efficient [4].

Furthermore, one of the **Environmental Benefits** value added for agency due to the utilization of existing information. They will be able to deliver more customer-oriented services by sharing government information across different levels of governments such as between local agencies, the federal government, and public [5].

Usefulness

Usefulness refers to an expansive principle that focuses on the value of information as a public asset [8]. Example Waqf system in State Islamic Council needs to comply with Administration of Islamic Law (Kedah Darul Aman) Enactment of 2008, sect 58.

[Publication of list of waqfs, nazr, and Trust]
 "58. As soon as possible after the 31st day of December every year, the Council may provide, produce and broadcast the way the Gazette a list of all property, investments and asset vested in the Council, subject to any waqf, or nazr and the not be part of the treasury".

An officer of Waqf Department stated:

Islamic Council should gazette land information and waqf assets after the completion of processing. Land information gazetted using

the government gazette and the gazette should be purchased and reserved. Data was gazetted in SUK

Another Officer of Waqf Department stated :

The waqf information is not confidential because according to the law, waqf land should be enacted or inserted in the Gazette.

Based on the interview, waqfdepartment will Gazette land information and waqf information assets after the completion of processing. Land information gazetted using the government gazette and the gazette should be purchased and reserved.

Stewardship

A stewardship refers to a conservative principle to ensure that government agencies work to protect the accuracy and integrity of the collected information and disseminate and promote the fiduciary responsibility of all government agencies in managing information [8]. In the waqf system, waqf pronouncement form will be filled by the applicant. A revision in terms of accuracy and validity of the information will be made by officials in the District Religious Office. Once information is reviewed, the form was confirmed and signed by the officer in the District Religious Office. An officer of Waqf Department stated :

Once the form was signed, the information is conclusive. In the process and preparation of documents, the accuracy of the data revision checked in the District of Religious Office. If there are any errors, it will be corrected in State of Islamic Council and the process of correction with leave fingerprint cop on the corrected portion. The process of correction can be done before the grant is registered, but if corrections are made after the grant has been

registered then the correction process will be complicated.

Inter- Organizational Dimension

One of the items under inter-organization dimension is Scope. It determines the functional areas and the organizations involved in and affected by a GIS. There is four type of initiatives such as Intra-Organizational, Inter-Organizational, Cross –Sectoral and Trans-National. In the case study, there is one initiative involved in namely Inter-Organizational. Inter-Organizational refers to an initiative involving different agencies at the same (horizontal) or different (vertical) government levels[8]. Sharing information among organizations depends on the creation and maintenance of inter-organizational relationships. The relationship between agencies critically dependent on trust [15]. Furthermore, the inter-organizational relationship also influenced by problem characteristics such as problem situation or different opinion between organization about nature of the problem to be solved [15]. In the case study, there are two levels of government agencies involving in cross- boundary information sharing and integration as shown in Figure 4.

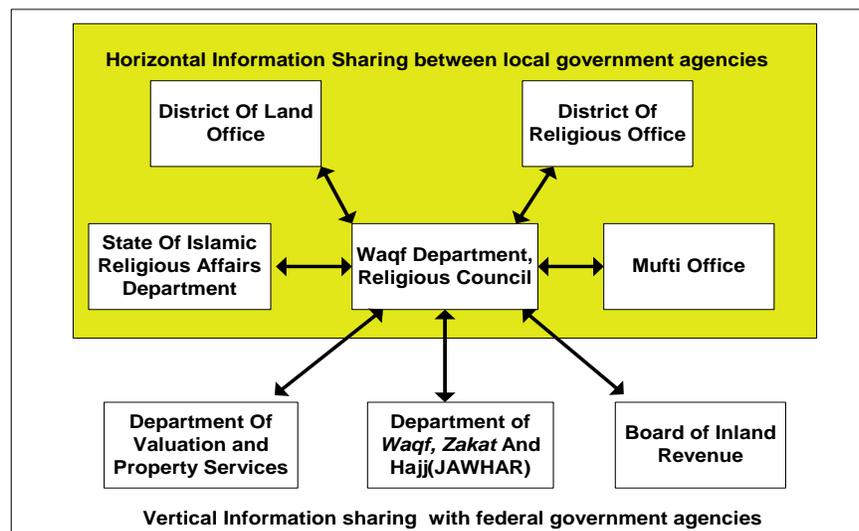


Figure 4.: The Level of Information Sharing in Waqf Department Of State Religious Council. Agency

The first level related with Horizontal/local information sharing between the Waqf department and different agencies such as State of Islamic Religious Affairs. Department, District of Land Office, District of Religious Office and Mufti Office. In the Horizontal information sharing, the District of Land Office was found to be primary agency in this relationship. Most of the Waqf management process were handled by this agency. The information can be shared between Waqf Department and Land Office which include land premium payment claims, the notice to attend the trial, G-Form, K-Form, 14 A Form, Land plan, the land title, a request for acquisition of land and payment checks. Furthermore, Information that can be shared with

Department of Islamic Religious Affairs Mosque includes mosque application information and results of the mosque application.

Information can be shared between District religion office and Waqf departments such as a letter of waqf application, land plan, the plot of land, General land Report, 'lafaz wakaf' letter and 14A/12B form.

Waqf application can be made through District of Religious Office or State Islamic Religious council. Meanwhile, Information can be shared between Waqf department and Mufti departments such as *istibdal* land acquisition paperwork and the '*fatwa*'. Waqf department also has Vertical information sharing with the Federal government such as Board of Inland Revenue, Department of Valuation and Property Services, and Department of Waqf, Zakat, and Hajj (JAWHAR). Information that can be shared such as Waqf information and Land information, for instance, land valuation.

Organization dimension

Under organizational dimension, there are roles, top management support, and IT capability. In the study, one of the factors that affect the sharing of information in the *waqf* system is the roles.

Roles

[8] list five roles which are (1) Regulator- to ensure compliance with GIS –related laws, regulations and established rules; (2) Collector is responsible for gathering information from other entities; (3) User responsible for making use of information; (4) Producer responsible for producing information; and (5) Provider responsible for supplying information.

In the case study, while executing *waqf* application process, different units play different Roles. *Waqf* department consists of four unit namely Land Application and Acquisition unit, *Waqf* unit, Tax, and Records unit, and Technical and Rental unit. Each unit has different roles. *Waqf* unit responsible as a regulator to make sure all the *waqf* processing comply with the laws, regulation, and established rules. *Waqf* unit and the Technical/Rental unit also responsible as a collector. *Waqf* unit has to collect *waqf* information such as land and owner data. Meanwhile, the Technical and Rental unit have to collect information related to *waqf* property rental. *Waqf* unit also can be as a producer and provider to produce and provide *waqf* information for the public and federal agency.

Top Management support

Top Management support refers to the commitment of top management to support electronic information sharing [1]. In the study, top management in *Waqf* department tended to be highly supportive of IT adoption in general. They were willing to use a new

system for sharing information with other agencies. However, the sharing of information can't be implemented because of different policies, operational procedures and management styles among the agencies. For example, *Waqf* department and the Land department can't share information through the online system because they have different culture and policies. [23] claims that developing a new information sharing and integration system sometimes requires process re-engineering inside of the Department. Also, top managements are reluctant or afraid of change, electronic information sharing is less likely to occur [1].

IT Capability

IT capability refers to the availability of IT resources and expertise within a local organization that enables electronic information sharing [1]. In the study, *Waqf* department lacked the equipment required to engage in the information sharing. Furthermore, there appeared to be a deficiency of operational computerization, as well as limited IT skills.

Technological Dimension

This dimension involves ICT - related in concepts supporting or affecting information sharing [8]. Two components involved are a unit and data components. The unit refers to an organization involved in the GIS initiative, the lowest organizational structure involved in the initiative. In this case study, *Waqf* department in government agency needs to share information about land's *waqf* with other local agency such as District of Land Office. Also, *Waqf* department responsible for handling all processes related to *waqf* management.

The unit is related to different activities and responsibilities on information required for GIS purposes [8], which is called as Life-cycle. Each activity is viewed as a stage defined into several stages namely create, collect hold, use, archive, dispose of, access, and provide. Table 3 shows the activity stages in the case study.

Table 3 :Activity Stages

Activity Stage	Description
Create	Create a new <i>Waqf</i> file
Collect	Gathering <i>waqf</i> information
Hold	Keeping <i>waqf</i> file in the database
Use	Making use of <i>waqf</i> information for a given purpose, for example, deliver <i>waqf</i> information to JAWHAR
Archive	Storing <i>waqf</i> information for future use in the database
Access	Allowing the staff of <i>waqf</i> unit to obtain information from <i>waqf</i> database for a given purpose
Provide	Making <i>waqf</i> information available. For example According to Administration of Islamic Law (Kedah Darul Aman) Enactment 2008, 58 Sect, all <i>waqf</i> land must broadcast to the public.

Furthermore, Technological dimension also refers to data component that represents a physical or abstract concepts from the real world [8]. In this study, data component involved in *waqf* systems include *Waqf* Applicant/Land Owner, Land grant, *Waqf* information, land information, land administrator, ownership transfer application, ownership transfer receiver, land application, complaint, and complainer

Organizational components -Business process

The organizational component is a component that supports organizational aspects of GIS such as Business Processes and Leadership. Business process refers to a set of coordinated activities executed by persons and software that enable the accomplishment of GIS [8]. In the case study, staff in the *Waqf* department using Electronic mail and an instant message like WhatsApp for communication and sharing of information. [23] claim that organizations participating in the same business process are more likely to share information with one another than those that are not [23].

STAGE2 :Infrastructure Support

This stage presents two main concepts: component and best practice. A component refers to an element that can be present in a GIS to support infrastructure and Best practice refers to a technique, methodology, practice, procedure or another element to lead to good GIS performance [8]. In this stage, just one concept was found and discussed here.

STAGE3 : Information Strategy

This stage contains initiatives to enable and sustain Information sharing among government agencies [8]. There is four component of this stage such as technical initiative, organizational initiative, inter-organizational initiatives and environmental initiative. In this stage, just one component was found and discussed here.

Technical Initiative

Technical initiative refers to any project delivering in ICT to support GIS such as blogs and e-Newsletter. In the study, the agency does not have any project delivering in ICT to support GIS. But the agency has a website to deliver information about *waqf* but it is not enough because *waqf* application still in the manual. As a suggestion,

the Agency should develop a project that responsible in delivering *Waqf* information through ICT, example online *waqf* system, blogs, and e-Newsletter. This project could be one of the promotion

5. Suggestion based on the Case Study

The analysis of the case study which was based on the GISF of [8] shows that information sharing status in relation to the *waqf* system is still in Stage 1- Experience Sharing. The current status of *waqf* system is still in the manual system. Yet it poses lots of challenges with the lack of other criteria from the four dimensions to support information sharing development. The summary of the results is shown in figure 5. There are some suggestions recommended for the *waqf* system in a way to advance to Stage 2. Among the recommendations for agency to consider are:

- i. A high priority for having an online *waqf* system to enable a quality sharing of information among agencies such as Department of the District Religious, the Land Office, Mufti Department and Department of Islamic Religious Affairs.
- ii. To set up of an Information Management group or expertise which governs the coordination and collaboration of information between the agencies in sharing information.

methods to promote about *waqf* and at the same time, public able to get information about *waqf* easily.

- iii. A specific funding to ensure Government information sharing project works properly especially budget for GIS monitoring.
- iv. Technical components to support Government information sharing. *Waqf* system must be highly supported with suitable hardware, network, standards for data exchange, and also standard that representing the meaning of data, service and process description. *Waqf* system needs a security, to ensure secure interoperation; and Authentication, for example, digital signatures and digital rights.
- v. In terms of Organization components, to ensure the accomplishment of e-*waqf*, Leadership must be able to enforce the organizational, process and cultural changes for GIS in *Waqf* Department. *Waqf* system also must have an element like Agreements, a partnership between parties, Negotiations, Contract and trust.

		MATURITY STAGES		
		1. Experience Sharing	2. Infrastructure support	3. Information strategy
DIMENSIONS	ENVIRONMENTAL	Principle, benefit, barrier	-	-
	INTER-ORGANIZATIONAL	vertical, horizontal scope		-
	ORGANIZATIONAL	roles	business process	-
	TECHNOLOGICAL	Lifecycle, Unit, data component	-	website

Figure 5.: Government Information sharing framework (GISF) for *Waqf* System.

6. Conclusion

In summary, a government agency commonly has to deal with different government agencies to have information sharing to run its operations or to make its operations more efficient in innovative ways. Currently, in Malaysia, little information is shared and exposed to Malaysian government agencies, in relation to information sharing, including the aspects of ownership, requirements, stages, confidentiality, security, and integrity. A study has been conducted with an objective to explore the practices and stages of information sharing among the state agencies in delivering e-Government services. A case study methodology was adopted in this research. The Qualitative data are collected through semi-structured interviews with the case study from the *Waqf* department of government agency. The interview questions are about the information sharing practices between and among agencies. By adopting Estevez's framework of Government Information Sharing, the discussion of the various stages in this paper can provide a more thorough

lens to understand the preliminary complexity of Government information sharing and integration. In the case study, the

information sharing practices and the stage of GIS are identified. It is shown that *waqf* system is in Stage 1 (experience sharing). Furthermore, some suggestion has been suggested as a guide for the agency to move from Stage 1 to Stage 2. *Waqf* department should have a strong technical component and also recommended setting up Information Management Group for information sharing coordination. Furthermore, *Waqf* department must also consider about financial situation to ensure that information sharing project can be implemented. For the future studies, it will be interesting to further apply the framework of Government information sharing to the context of online e-service, to explore the dimension and different stages of information sharing.

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