

# Electronic Information Sharing to Improve Decision Making in Public Universities

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**ABSTRACT** — *Sharing of information is one of the essential characteristic that makes the quality of businesses getting better. With the advent of information and communication technology (ICT), electronic information sharing is increasingly required in order to support decision making. Ministry of Higher Education and Scientific Research (MOHESR) in Iraq has given public universities authorities in making decisions. However, not all Iraqi public universities are able to make own decisions due to low experiences and insufficient resources, such as information. The lack of electronic information sharing between universities and MOHESR is considered as a huge gap in order to increase the universities' information. Four characteristics known as electronic information sharing, technological, organizational and environmental are studied to understand how they could influence universities to make better decision making.*

**Keywords**--- Information sharing, electronic information sharing, decision making, higher education sector

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## 1. INTRODUCTION

Information sharing is a central process through which team members collectively utilize their available informational resources. In details, it involves the exchange of information among employees within or outside an organization or by giving an access to other organization to their data and information in order to improve decision making [1]. Information sharing comes up from the complexity of solving problems on the delivery of services to public organizations [2].

Information sharing via the Internet is known as electronic information sharing (EIS), and with the advent of ICT today, EIS becomes a must to any agencies in speeding information sharing and delivery. The Iraqi public universities, like other universities, make use of the Internet to get the information and knowledge for scientific research purposes, and to share information between universities staff and MOHESR [3]. However, the limitation of electronic information sharing is considered as an enormous gap between Iraqi public universities and MOHESR [4], [5], [6]. This problem presently exists among Iraqi organizations and has been recognized by public universities in Iraq [7].

## 2. LITERATURE REVIEW

According to [8], EIS among public agencies helps them to attain benefits, such as increased information accuracy, timeliness, resources and interaction organizations. It also helps them to reduce paperwork, improve data management and improve decisions making. According to [2], EIS can play an important role for cooperation, decrease cost and augmented productivity, accuracy of information, completed information for decision making, and enhanced the collaborations among government organizations [2], [9]. Finally, electronic information sharing gives improvement in decision making of political and business processes which diminishes the power of the centralized decisions [10], [11].

The importance of information sharing among universities or between universities and ministry of education is

not a denial. For example, the government of South Korea believes that it is essential to share information among education agencies for the principle of providing more efficient and effective processes [12]. In Cambodia, the higher education agencies agree on the difficulty to coordinate among agencies in terms of information sharing [13] while in Malaysia, according to [14], Malaysian Higher Education's important plan for the next years is to handle communication and information sharing.

Previous research has described three kinds of information sharing [8] (a) intra-organizational information sharing, which the intention of individuals to share information has been analyzed, (b) inter-organizational information sharing, which focuses on sharing information among two or more organizations and (c) inter-agency/department information sharing, which focuses on sharing information within the organization and across its departments. Moreover, according to [15], there are two types of information sharing functioning; 1) vertical functioning, and 2) horizontal functioning). The first means information sharing with different level of organization while the second refers to information sharing within same level of organization.

Currently, there is limitation of studies on EIS in terms of vertical or horizontal functioning between government organizations [15], [23], [30]. In specific, there is lack of studies on any vertical EIS in inter-organizational in public organizations and higher education of institutions in Iraq [7]. Thus, a study was conducted to focus on vertical functioning information sharing between Iraqi public universities and Ministry of Higher Education and Scientific Research, which refers to different level of organizations.

### 3. THEORETICAL FRAMEWORK

This study adopts social exchange theory and critical mass theory to inspect the factors that influence electronic information sharing between Iraqi public universities and MOHESR. These theories had been applied in electronic information sharing studies. The framework of this study comprises four characteristics known as electronic information sharing, technological, organizational and environmental. Each characteristic is composed of several factors.

#### 3.1 Electronic Information Sharing Characteristics

Electronic information sharing has features that affect the means of electronically sharing information among government agencies [16]. A number of characteristics affect electronic information sharing, such as information quality [17], [18], [19] and benefits and risks [20], [21], [22], [19].

Benefits pertain to the possible gains of electronically sharing information among agencies, such as inexpensive, increased accuracy of information, and decreased time [17], [23]. Employees in Iraqi public organizations lack good understanding regarding the significance of government in electronic sharing information, which diminishes the importance of increasing electronic information sharing in Iraqi government [24], [25]. Hence, it is hypothesized that:

**H<sub>1</sub>:** *Benefits will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.*

Similar to benefits, government organizations consider the risks relative to the projects of electronic participants [21], [26]. Numerous vast risks of sharing information among agencies exist, for instance, making important information accessible to strangers [18]. The risks are taken as the core factors for augmenting information sharing among the Iraqi public organizations because government information is protected from threats and malevolent acts, hence escalating the level of trust and confidence between these organizations [24], [25], [27], [28], [29]. Hence, it is hypothesized that:

**H<sub>2</sub>:** *Risks will have a negative effect on electronic information sharing between Iraqi public universities and MOHESR.*

The costs of electronic information sharing refer to the costs of obtaining the useful technology for sharing, including the system, installation, implementation, migration, integration, interface, training, maintenance, and communication costs [18], [23], [30]. Finance is one of the major problems in Iraqi agencies because the money that the agency acquires is insufficient to purchase hardware and software that develops a real platform for increasing electronic information sharing [27] Hence, they are hypothesized that:

**H<sub>3</sub>:** Costs will have a negative effect on electronic information sharing between Iraqi public universities.

### 3.2 Technological Characteristics

Technological characteristics refer to the use of external and internal technologies to ascertain relationships and collaboration among government agencies [12]. [31] explain that information sharing and technology are practically connected with one another because information sharing is deemed as an IT project [22]. This study concentrates on the following factors:

IT capability pertains to the use of technological sources and experiences in government agencies to motivate employees to electronically share information [23]. The IT skills of staff and availability of software and hardware have influential effects in and within the Iraqi public organization. The augment of IT capabilities in the public organizations in Iraq increases electronic information sharing [4], [24]. Moreover, the dearth of infrastructure and a huge gap in the IT skills between government agencies are evident [25]. For this study:

**H<sub>4</sub>:** IT capability will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

The quality of government services available for the public improves the relationship between government agencies and citizens and enhances the efficiency of interactions. Information quality comprises of several characteristics, such as timeliness, accuracy, credibility, and adequacy of information sharing. However, decision makers in Iraqi public universities are attentive to obtaining high quality information since this approach allows them to make the best decisions [33], [34]. The hypothesis in this study is:

**H<sub>5</sub>:** Information quality will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Compatibility is about the capacity to provide equal levels of software, hardware, and skills in each government agency [18], [19], it encompasses of organizational and technical compatibility. Organizational compatibility pertains to the compatibility in the skills of staff at each level of government, which aids in electronic information sharing [23], [30]. Technological compatibility refers to the unification of information technologies (software and hardware) needed from the staff to electronically share government information [16]. [27] stated that the incompatibility in staff skills and experiences as one of the organizational barriers and the incompatibility of software and hardware as one of the technical barriers in Iraqi public organizations. Hence the related hypothesis is:

**H<sub>6</sub>:** Compatibility will have a positive effect on electronic information sharing between Iraqi public universities.

Complexity refers to the extent to which participation in electronic information sharing with organizations is alleged as a relatively difficult process [8]. Some public organizations took the decision to discontinue the usage of information systems because of the complexity of these systems [16]. Iraqi organizations need some thoughts upon a number of technical issues and hence they need to comprise new change to their operational systems [35]. In relation, hypothesis is given as:

**H<sub>7</sub>:** Complexity will have negative effect on electronic information sharing between Iraqi public universities and MOHESR.

Data warehouse offers solutions for issues regarding electronic information sharing as the DW sets up a platform for attaining electronic information sharing [36]. Moreover, electronic information sharing can be set up directly by utilizing email and indirectly by making use of data repository such as data warehouse [8]. Information sharing can be improved with the help of the central information system of government agencies [37]. According to [25], Iraqi departments that belong to the same level should have a common database to promote information sharing and boost interaction. Moreover, according to [38], data warehouse can improve the performance of the Iraqi universities, augment the interaction among them and develop the quality of inserted information. Hence, they are hypothesized that:

**H<sub>8</sub>:** Data warehouse will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

### 3.3 Organizational Characteristics

Agency characteristics mean the internal factors that have an influential effect on government agencies, thus encouraging the staff to share information with other agencies [8], [10]. This study focuses on the following factor:

Top management support means the support of top managers that can develop a better environment in which employees are encouraged to share information with other agencies [10], [31]. [24] Stated that one of the vital factors for the Iraqi public organization is the top management support. Leadership is simultaneously essential in encouraging the staff to contribute and enhance their skills and knowledge by sharing them with others. Additionally, political leadership and strong management are needed in the Iraqi government system to sustain hard work to promote the staff to become more creative [39]. Hence the hypothesis is set up as:

**H<sub>9</sub>:** Top management support will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Good network collaboration among organizations can augment and handle the delivery of public services [40] that enable information to be shared efficiently. Collaboration is required because of the difference of culture and commitment between participants. Moreover, it has been identified as a complex processes within long time to attain the objectives and goals of organizations [41]. Iraqi government organizations have to boost the collaboration between them [24]. The hypothesis is thus coined as:

**H<sub>10</sub>:** Good collaboration will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Size refers to the effects of organization size on electronic information sharing [16]. Some large organization utilizes electronic information sharing as a traffic records division was already in place, together with a workforce liable for data entry and IT staff to maintain the initiative. Amusingly, an augment in size did not essentially interpret into electronic information sharing [8]. However, some small agencies, especially those with supportive top management, were found to be more novel and keen to share information electronically [12]. Therefore, this study suggests that the size of the university can affect the communication and information sharing with MOHESR. Hence, it is hypothesized that:

**H<sub>11</sub>:** Large size will have positive effect on electronic information sharing between Iraqi public universities and MOHESR.

### 3.4 Environmental Characteristics

Environmental characteristics refer to the effects of the environment on the operations of government agencies [16]. Researchers have explained several influential effects from the external environment that the agencies cannot disregard [19], [23], [30]. This focuses of the study are on the following factors:

According to [23], one of the main factors in the electronic information sharing environment is policy and law because the politicians may compel extra barriers if each government agency has dissimilar rules and standards on sharing e-information [19], [23]. The e-Iraq has integrated a policy called “legal frames,” in its future plan which gives any individual in Iraq with the facility to securely share his/her information [42]. The Iraqi government has created the Government Interoperability Framework (GIF), a standard document on sharing e-information among government agencies [43].

**H<sub>12</sub>:** Policy/legal framework will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Interagency trust is explained as the belief that the information has been sent to the correct agency and is considered to be helpful to the agency. Conversely, interagency trust pertains to the certainty that the information has been received from the correct agency, and the information is proper [16], [8], [22]. Therefore, the Iraqi government should enhance the trust among staff since trust is a significant and essential factor among public organization [27]. Hence, it is hypothesized that:

**H<sub>13</sub>:** Interagency trust will have a positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Upper level leadership means the capability of an external leadership to put forth influence on its organizations to act in a prearranged manner ([8], [15]). We observed the university made use of various types of power to boost electronic information sharing. Precise plans are included such as encouragement, recommendations, providing incentives, and imposing penalties. Iraqi public organizations have external effect from the upper level leadership [6], [24]. Hence, it is hypothesized that:

**H<sub>14</sub>:** Upper level leadership will have positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Critical mass means the organizations that presently sharing or will share its information by making use of electronic information sharing project [16]. When organizations made decisions to use electronic information sharing, they are affected by the acts of similar organizations [44]. If the organizations are successfully sharing information electronically, that can facilitate to inspire non-sharing organizations [8]. This study suggests that a lot of participant universities can offer more encouragement to share information electronically with MOHESR. Hence, it is hypothesized that:

**H<sub>15</sub>:** Critical mass will have positive effect on electronic information sharing between Iraqi public universities and MOHESR.

Social network is defined as personal relationships between inter-organizational [45]. It comprises relationship, mutuality, long-term benefits, trust, favor, loyalty, concept of commitment and reciprocity [23], [46]. Better trust environment and improved ability of cooperation in electronic information sharing can be obtained from good social network between inter-organizational [15], [23]. Staff behavior has influence effect in Iraqi organizations [27]. Hence, they are hypothesized that:

**H<sub>16</sub>:** Social network will have positive effect on electronic information sharing between Iraqi public universities and MOHESR.

#### 4. CONCLUSION AND FUTURE WORKS

Electronic information sharing, technological, organizational and environmental characteristics are the matters that could determine the success or failure of information sharing practice between Iraqi public universities and MOHESR. In addition, this study suggested for the utilization of a data warehouse as a factor in electronic information sharing research so as to augment information to be shared between the Iraqi public universities and MOHESR.

This study is still in the progress. Questionnaires have been distributed to participants to determine the significant factors. Data will be analyzed to test the hypothesis and validate the theoretical framework. The involvement of these factors, if significant, will enhance the inter-organizational information sharing in Iraqi public universities in the future.

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