Exploring the Influence of Organizational Context on Cross-boundary Information-Sharing Initiatives: The Case of the Saudi's Government Secure Bus

Mohammed A. Gharawi
Information Technology Department
Institute of Public Administration
Riyadh, Saudi Arabia
algharawim@ipa.edu.sa

Hashim H. Alneami
Information Technology Department
Institute of Public Administration
Riyadh, Saudi Arabia
alniamih@ipa.edu.sa

Abstract— **This study addresses the organizational factors influencing cross-boundary information sharing (CBIS) initiatives within the context of Saudi Arabia (SA). The study starts by synthesizing the pertinent literature toward implementing an integrated model for the organizational factors influencing CBIS. A qualitative research approach was used to guide the research and the data was collected using interviews and documentation. The study shows that the adoption of the Government Secure Bus (GSB), implemented to facilitate information sharing between government agencies in SA, is influenced by nine factors identified by previous research. These factors include goals and interests of participating organizations, trust, executive support, risks, costs, benefits, authority and hierarchical structures, organizational culture, and leadership. Additionally, the study pointed to three additional factors that influence GSB adoption. The additional factors include mimetic pressures, e-government transformation measurement, and organizations' perception of data quality.**

Keywords—Information sharing; Government Secure Bus; e-government.

I. INTRODUCTION

E-government is considered one of the most important strategies to achieve efficiency and effectiveness in government programs [1]. It facilitates the provision of services by using information and communication technologies [2]. Given the many proposed maturity-level frameworks of e-government, the role of information sharing across government agencies seems crucial for applying e-government and providing integrated services [3]-[4].

Groznik and Trkman [5] noted that it is relatively easy to achieve the initial levels of e-government as the focus of these levels is on providing information services that require some minor changes to internal processes. However, the situation is different when considering the higher maturity-levels as these advanced levels require integration and exchange of information with other agencies. In fact, the information and data needed by government agencies to provide integrated electronic services are usually scattered among a group of different organizational entities [5].

Many researchers point out that although many agencies have integrated their services within their internal scope, they still need to interact with other government agencies to achieve higher levels in e-government maturity [6]. Accordingly, there is an urgent need to facilitate information sharing between government agencies at different levels and

functionalities. Pardo et al. [7] stressed that one of the key components of the e-government initiative is the ability to exchange information and data beyond traditional regulatory boundaries between multiple government agencies. They also noted that a single agency does not have all the information resources needed to provide integrated electronic services without other agencies' support.

The scope of cross-boundary information sharing (CBIS) between organizations in the public sector ranges from solving problems in a specific program to the need to build the institutional capacity, and the complexity increases when we transit from the organizational to the inter-organizational level [8]. Existing studies have stated that initiatives aiming toward integrating information-sharing systems in governments fail often, despite the increasing recognition of their importance by management in public organizations [9]. Thus, while CBIS is considered as an important factor in achieving e-government, it involves complex interactions within the social and technical contexts. In addition, government agencies face different challenges in CBIS from those of the private sector, as government agencies have to achieve many objectives that may contradict each other [5].

Previous research has shown that CBIS can increase productivity, improve performance, enhance policy-making processes and lead to better service delivery by the government (e.g., [1]). Additionally, efficiency is a key target of CBIS, bearing in mind the financial issues encountering several leading governments across the globe [10]. Its importance goes beyond a specific domain to include every area of public life, such as economic development, education, public health, municipal services, and even criminal justice. In addition, despite the tremendous amount of information gathered by government agencies, bringing together a group of different agencies involved in diverse settings is never an easy task as government agencies face many technical, organizational, regulatory, and political obstacles that hinder their orientation toward CBIS [1]-[11].

The e-government program in the Kingdom of Saudi Arabia (Yesser) has recognized the importance of CBIS since its inception. Accordingly, the program established the Government Secure Bus (GSB) to facilitate the integration and exchange of joint government data between various government agencies. The GSB plays a pivotal role in facilitating the sharing and integration of information across government agencies and is considered today as one of the main pillars of the national IT infrastructure in Saudi Arabia.

The GSB consists of intermediate systems with integrated hardware and software architecture designed to facilitate the exchange of government information between government agencies to ensure the timely delivery of online services [12]. Following the operational launch of the GSB, efforts have been made to establish the foundations of integration, including the construction, maintenance, and management of the GSB. There are two integration modes with the GSB as any government agency can connect to the GSB as a provider of data, information, and services that can be used by other government agencies through the bus. Also, it can connect as a user of the services and information provided by other agencies.

While many government agencies are already connected as GSB users, it was noted that there are still more than 100 agencies not connected to it. Only 108 government agencies have participated in the GSB [12]. Therefore, the main objective of this research is to identify the organizational factors that encouraged these agencies to engage and share their information and data through the GSB, and to indicate the obstacles that prevent others.

As information sharing is a complex phenomenon with many dimensions that may vary from one context to another, it is difficult to present a general theory of information sharing. However, Wilson [13] clarified that when the attention is focused on a particular area or context, factors influencing information sharing become more specific, and then it becomes possible to establish a preliminary conceptual framework to demonstrate and investigate this phenomenon. As a result, our research will focus on addressing the complexities and ramifications of CBIS by answering the following question:

- What are the organizational factors that influence cross-boundary information sharing through the Government Secure Bus (GSB) in Saudi Arabia?

Previous research has contributed to our understanding of many factors that may promote or impede CBIS in Western countries. However, there has been little empirical research in the area of CBIS within the context of Arab countries. The scarcity of rigorous studies of this phenomenon within the context of the Middle East represents a knowledge gap in the relevant literature and a gap in the knowledge available to government practitioners who are more likely to engage in CBIS initiatives.

In this research, we present an integrated framework based on relevant literature of the factors at the organizational level that may promote or impede CBIS. The framework identifies and discusses these factors as they relate to the organizational context. We conclude with an integrated conceptual framework that will be tested in the subsequent phases of our research.

The following sections start by reviewing previous research and presenting a theoretical framework for the organizational factors affecting cross-boundary information sharing. After that, the factors depicted by the proposed framework will be tested by applying them to the GSB case. It is expected that the study will contribute to the field in identifying new trends for the factors influencing CBIS, which will contribute to enriching the knowledge aspects and open new horizons for future research in e-government.

II. LITERATURE REVIEW

Previous research identifies the contextual elements that may influence the orientation of public organizations toward CBIS. These contextual factors are depicted in three layers of context: the information content and technical context; the organizational context; and the national context [14]. The information content layer captures the characteristics of information being shared and technology being used to facilitate the sharing process. The organizational context embodies the structures, capabilities, and constraints of the participating organizations. The national context corresponds roughly to regulations and policies at the national level. This study focuses on the organizational context only.

Previous research has also shown that many organizational-level factors may influence CBIS' effectiveness. These factors include the goals and interests of participating organizations, trust, executive support, risks, costs and benefits, authority and hierarchical structures, organizational culture, and leadership.

The organizational interests are rooted in the presence of diverse goals, missions, and priorities on the part of the participating organization [15]-[16]. Such interests may play significant roles in promoting or hindering CBIS. In this study, organizational goals and interests refer to the extent to which the goals and interests of participating organizations in the GSB are consistent with each other from one side and with the goals and interests of the Saudi government program (Yesser).

Trust represents another factor that may influence CBIS at the organizational layer of context. It refers to the degree of confidence or faith in the intentions and behavior of others or the lack of such confidence or faith. Luna-Reyes et al. [17] stated that trust-building processes and collaborations are key enablers for collaborative digital government (DG) projects and they are, at least in part, also affected by the organizational and institutional environments. Trust, therefore, represents another key factor in understanding CBIS because it plays a significant role in establishing, developing, and maintaining inter-organizational relationships [18]-[19].

Executive support may influence CBIS as well. It refers to the extent to which executives and top-level managers from the participating organizations are involved and willing to commit resources, provide incentives, and issue directives [20]. Executive support is important throughout all stages of the CBIS. Previous research identified executive support and organizational commitment as being among the main factors that might promote or hinder collaboration toward information sharing [20]-[21]-[22]. One important job that can be done by the executives is to develop incentive mechanisms that can be applied to encourage an information-sharing culture among workers [23].

Risks, cost, and benefits are additional factors to be considered when studying the factors influencing CBIS. Risks refer to the extent to which participants believe their environment, actions, or relationships threaten something of

current or potential value to their organizations [1]; costs refer to the kind or amount of current or expected resources and other investments required as inputs from the participating organizations; and, benefits refer to the positive results or returns, which might be financial, societal, political, or associated with mission performance [1]. Participants' perceptions of these three dimensions are critical factors in the success of CBIS [1]-[22]. As risks often manifest in inter-organizational relationships, previous research discussed the importance of negotiation and developing commitment as two strategies to overcome risks and promote collaboration in CBIS initiatives [19].

Authority and hierarchical structures have been discussed as influencing factors on CBIS. They refer to formal legal powers, legitimacy, differences in hierarchical structures, and formal control over actors and activities [21]-[24]-[25]. Legal authority plays a significant role in instituting the relationship, and during the initial phases of the collaboration toward information sharing [21]. Eglene et al. [21] explored the role of formal authority on CBIS' overall success and pointed out that success is not a result deriving from authority between participants, but of historical relationships between the lead agency and other participants within the network. The hierarchy of authority, formal means of communication, and policy standards can discourage many forms of information and knowledge sharing, including cross-boundary information-sharing [26]. After establishing the relationship, however, the negative influence of legal authority, centralization, and hierarchal structures can be bridged through the different modes of trust introduced previously in this section.

Previous research also pointed to organizational culture as the main factor influencing organization members' attitudes toward sharing knowledge and information [27]-[28]. According to [29], when an organizational culture emphasizes fairness, affiliation, and innovation, the culture can positively influence its members' intentions to share information. An organization's culture may, however, also impose a negative influence on the organization's interests toward sharing. According to [30], if the collaboration involves tasks that are not part of the organizational culture, members of the said organization may attend to the task with less energy and interest; moreover, participants may resist taking on a task if it seems incompatible with the prevailing organizational culture.

Finally, CBIS researchers have demonstrated also the roles that leadership can play in promoting the success of information sharing [15]-[20]-[21]. Eglene et al. [21] argued that the success of the CBIS is often associated with leaders who dedicate their time and energy to people's needs. Leadership can, in general, be exercised in different ways, thereby generating multiple meanings or interpretations of the concept. According to Gil-Garcia et al. [31], leadership is exercised and manifested through executive involvement, formal authority, and informal leadership. Informal leadership is the main focus of this research. Informal leadership can be exercised to build trust among participants, facilitate the interactions of participants from varying backgrounds, provide localized solutions to complex problems, and clarify the roles and responsibilities of participants in the collaborative process [31]. Thus, exploring the influence of this factor becomes one of the keys to building a better understanding of the factors that influence CBIS. "Table I" summarizes all of the organizational level factors that might influence CBIS.

TABLE I. FACTORS RELATED TO ORGANIZATIONAL CONTEXT

FACTOR	DEFINITION
Goals and Interests	This refers to the extent to which participants' goals and interests are consistent with one another.
Trust	This refers to the degree of confidence or faith in the intentions and behavior of others (or the lack of such confidence or faith).
Executive support	This refers to the extent to which executives and top-level managers from participating organizations are involved and willing to commit resources, provide incentives, and offer direction.
Risks	This refers to the extent to which participants believe their environment, actions, or relationships threaten something of current or potential value to their organizations.
Costs	This refers to the kind or amount of current or expected resources and other investments required of participating organizations.
Benefits	This refers to positive results or returns, which can be financial, societal, political, or associated with mission performance.
Authority and hierarchical structures	This refers to formal legal powers, legitimacy, differences in hierarchical structures, and formal control over actors and activities.
Organizational culture	This refers to commonly accepted and shared beliefs, values, and practices within the organization.
Leadership	This refers to participants' behavior, such as taking personal responsibility for actions and outcomes, providing guidance or direction, exerting influence, and giving rewards or punishment.

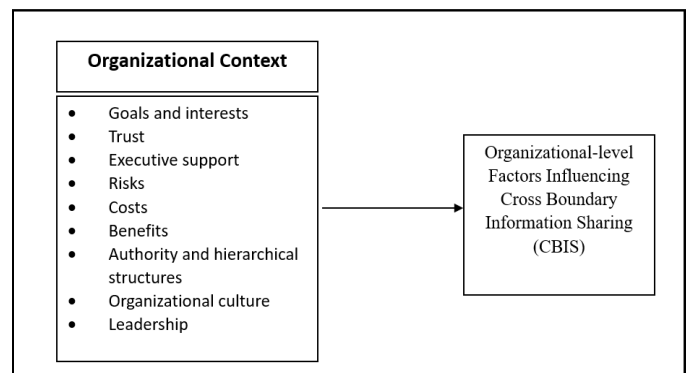III. PROPOSED THEORETICAL MODEL

Figure 1. Organizational Factors Influencing Cross-Boundary Information.

Based on the previous review, the study proposes a theoretical model for the factors influencing CBIS. The

model as presented in "Fig. 1" depicts the contextual complexity discussed in the previous section. Relying on this model, an interview protocol was developed to investigate the influence of various factors on CBIS, and the impact of the influential factors on attaining the GSB's stated goals.

IV. RESEARCH METHODS

This research explores and identifies the organizational factors that might influence the CBIS. The goal of the study is to extend the current knowledge-base regarding CBIS into a new context. This is achieved by relying on case study methods to identify the organizational factors influencing the orientation of public agencies in Saudi Arabia toward sharing their information through the GSB. Given the goal of this research and the GSB being introduced, the case study approach is most appropriate, as its main strength lies in its attempts to efficiently reconcile complexity, detail, and context [32]. Qualitative data has been collected from in-depth, semi-structured interviews conducted in person, as well as various secondary data sources, including government documents, Yesser website, and GSB manuals.

Ten government officials working as either CIOs or relation managers with government agencies at Yesser participated in this study. All participants played critical roles in the information-sharing projects that aim to connect government agencies to the GSB whether as users or providers of information and services. Most were involved in all phases of these projects' implementation. Participants also represent different management levels and organizational departments and units. Purposive sampling using a snowball method was used to identify individuals for interviews, starting with one of the relations managers at Yesser. Each in-person interview lasted from one to two hours. Several participants were contacted later, by phone, to obtain additional information and for the purposes of clarification. As all participants interviewed were native Arabic speakers, all such interviews were thus conducted in Arabic.

The unit of analysis of the study is the collaboration aimed at ensuring successful utilization of the GSB. The unit of observation of the study was individual organizations that connected to the GSB. The interview data were transcribed and analyzed in Arabic, and the data collected from the aforementioned secondary data sources were analyzed in Arabic as well. All collected data were coded and analyzed with an inductive approach. In the course of conducting data analysis, the qualitative software tool called Atlas-ti was used to support coding and analysis activities. Coding was conducted following two separate approaches proposed by [33], open coding and axial coding. Open coding refers to the process of reducing the data to a small set of themes that appear to describe the phenomenon being studied. In the context of this research, codes were added to the coding book when data pointed to any new concept that could refer to a factor influencing CBIS. The outcome of this step was a series of different concepts representing the meaning of the data.

V. RESULTS

Within the case study, several organizational factors influencing CBIS were identified. These factors include goals and interests, values, trust and past relationships, executive support, authority and hierarchical structures, leadership, resources, skills, capabilities, commitment, organizational culture, and perceived risk.

A. Goals and Interests

The goals and interests of most participating organizations were consistent with each other from one side and with the goals and interests of the Saudi's government program (Yesser), as indicated by one of the participants who said: "Almost all the agencies were willing to share their information through the channel and agree on its importance as a tool to facilitate and accelerate government efforts toward providing integrated services." Additionally, another participant affirmed: "The agencies and the national projects agree on the importance of the channel in creating opportunities that have an impact at the national level or the level of the agencies themselves". However, this was not the case with all agencies as pointed out by another participant who stated that "Some agencies deal with their data as exclusive property. Convincing such agencies to connect to the GSB was difficult." By investigating this issue further, it appears that some agencies are selling their data to other agencies and thus perceive their information as an organizational asset instead of a national asset. This perception toward government data has negatively influenced the orientation of some agencies toward sharing their information through the GSB as indicated by another participant who said: "There are agencies that refuse the idea as the goals for sharing their information through the channel conflict with their commercial use of their data".

B. Trust and Past Relationships

The Yesser program does not have mechanisms to compel agencies to share information via the channel. Therefore, the importance of having enough level of trust is crucial to motivate agencies to engage with the channel as one participant from Yesser program noted, "During the early stages following the launch of the GSB channel, we were forced to enhance the confidence of the government agencies in the channel and its importance and offer temptations to convince them." Thus, there was an insufficient level of confidence to promote agencies' orientation towards the channel during the initial stages. Additionally, "some participants such as the Ministry of Interior refrained from sharing their data with other parties through the channel for reasons of privacy and information security," as stated by another participant. However, as time went on and awareness of the channel's importance grew, this situation began to change.

While some participants indicated that the low level of trust was related to the agencies' trust in the program and those operating the channel, others related it to the lack of trust in people who could deal with the data from other agencies. Accordingly, one participant asserted that "trust is determined by the people involved in the process of

connecting agencies to the channel," and another participant stated that "trust depends on the people who run the business, not the agencies…their behavior and cooperation determine the level of trust." On the other hand, others declared their trust in the program and those managing the GSB and asserted that "while we trust the program, we lack trust in the people who will be able to deal with the data from other agencies."

This case study points to the importance of institutional trust during the initial stages of CBIS initiatives, according to one participant. "One of the reasons that accelerated the work was the prior agreements with the parties to exchange information through the channel." The results also indicate that the more successful the initiatives that the channel has played a role in, the greater the trust of the parties in the channel and those in charge of it. As one participant pointed out, "the increase in the number of successful initiatives that relied on the channel reinforced the orientation of the authorities towards sharing their information through the channel".

C. Executive Support

One participant noted that senior executives' support was present in this case when he said, "There is very much interest from top-level management in the GSB." Generally, the role of the executives' support in promoting the success of CBIS initiatives was evident in this case, as demonstrated by most interviews. For example, one participant referred to the role played by top-level managers in accelerating the linkage process to the GSB when he noted that "the support of senior management has had a significant impact in accelerating the process of connecting agencies to the channel." Another participant explained the way in which the involvement of executives at the ministerial level contributes to the GSB's success. He said: "In order to facilitate the completion of the work of the Citizen Account Initiative that is based on sharing information through the GSB across various agencies, we engaged the executives at the ministerial levels who established a committee of senior executives that helped a lot." Another participant noted that the support of senior management is the result of the pressure exerted by civil society on government agencies to urge them to provide integrated electronic services. He said: "Executives support increases as the number of people placing pressure on government agencies to provide integrated electronic services increases."

D. Risks

Risks, in this case, are linked to three key aspects: the value of information as perceived by agencies; information security; and privacy. These aspects had a negative impact on the channel as they either caused abstention or delayed some of the agencies' participation in the channel. In this regard, one of the participants pointed out that during the period following the launch of the channel, some of the agencies did not want to share their information through it for fear of losing their data value. He said: "In the past, there was no desire from government agencies to join the channel either for technical reasons or for the reason to preserve data

as a resource that could lose its value by sharing it through the GSB." Another participant confirms this more clearly by pointing out that "Some entities make money from their data and therefore refuse or refrain from sharing their data through the channel."

The analysis also reveals that agencies who refrain from sharing information through the channel believe the channel is insecure and that they can change their direction and link to the channel if the channel is secure. This was noted by one participant who said: "There is a fear that exists in the Ministry of Interior that has no objection to share data but does not trust the channels through which the data passes, especially in terms of information security."

In addition to the risks associated with information security, there seem to be concerns among some participants of the risks related to the violation of privacy. One participant from Yesser explained this when he said: "Often, the agencies refuse to cooperate with us for fear of privacy-related issues." Concerns about privacy violations are most pronounced among health organizations as pointed out by another participant: "There was a high level of fear among hospitals due to concerns about privacy violations."

E. Costs

The results indicate that connecting an agency to the GSB is not as costly as it can be considered as a factor influencing information sharing in this case. One participant referred to this when he said: "Connecting an agency to the GSB does not cost much, especially if the organization is already connected to a government secured network (GSN)." Although the cost is marginal, the Yesser program initially assumed responsibility for funding the operation as part of an effort to motivate government agencies to share information through the channel. One participant explained this when he stated: "In the past, Yesser was funding all the costs... Now, with the progress that the channel made, the authorities are taking care of this."

Therefore, the procedure now involved verifying the availability of required resources before starting the process. One participant noted: "We are pleased to ask before we start linking an agency to the channel whether they have the required budget as well as the availability of suitable technical infrastructure". The role of the Yesser program is currently limited to equipping agencies with competent teams that will perform the tasks related to the linking process as pointed out by another participant who said: "The agency usually sponsors the linking process and we work with them to prepare the team involved in the channel linkage process." Finally, the results also show that some of the parties are contracting with external companies to develop services that are based on the information made available through the channel. One participant explained: "The Ministry of Housing contracted with a national company to establish a housing verification service that required information shared by other agencies through the GSB."

F. Benefits

The case study shows that there are many benefits that can be gained by agencies as a result of their association with the channel. In fact, linking to the channel will enable entities to provide integrated electronic services, which all government agencies seek to achieve. This will contribute to reduced costs associated with providing government services in traditional ways. One participant noted: "Most agencies want to link to the channel because of their orientation towards electronic services, which enables them to complete transactions without dealing with their customers directly." Another participant explained these benefits in more detail by pointing out that: "When linked to the channel, we save efforts and take advantage of obtaining all the data we need from other agencies through one channel, this reduces costs compared to the costs required to establish separate connections with all agencies we need to obtain information from".

Finally, it should be noted that the link to the channel contributes to improving the image of the agency among the government leadership represented by the Council of Ministers, as the national index to measure digital transformation depends on several indicators that include the participation of the agency in the channel. One of the participants said: "Sharing agency information through the channel contributes to improving its rank in the national digital transformation index and its ranking in the Government Services Observatory index. This is important for the agency as it contributes to improving its image."

G. Authority and Hierarchical Structures

In analyzing the results of the interviews, it was noticed that the data authorities are not clear because of the lack of data governance frameworks in many government agencies. One participant pointed out that: "There is a near-total absence of regulations and rules to govern data within public agencies." Another participant confirmed this when referring to the limited number of entities with clear data governance. He noted: "There are few agencies with clear authorities regarding the information management and exchange."

The study also shows that the person who is usually authorized to make decisions regarding information sharing is the chief information officer (CIO). He said: "Normally, those who have the authority to approve data sharing in government agencies are the chief information officers…CIOs have the ability to determine the technical readiness and the data readiness to be shared with other agencies".

One participant highlighted a different point of view when he stated that obtaining the approval of the agency to exchange its data requires the approval of many public officials within the agency. He said: "We have noticed that working with government agencies depends on the people you deal with from these agencies…Normally, there is not a particular person who has full authority to share an agency's data, so it takes a lot of time to get the approval of the entity and communicate with many parties."

H. Organizational Culture

The results indicate that the bureaucracy inherent in the government sector has negatively impacted the tendency of government agencies to participate in the channel. "The majority of the people we worked with are active and enthusiastic about the idea, but bureaucracy sometimes adversely affects and hinders this enthusiasm."

In addition, the analysis pointed out the high level of resistance to change in a number of government agencies. Such resistance has impeded the orientation of government agencies toward their participation in the channel, as described by another participant: "When communicating with the agencies, some are cooperating with us and others are not responding adequately due to their fear of change." Another participant noted that the intensity of this resistance began to fade over time. He said: "In the past, some agencies were keen to remain in their status, but this orientation has changed in recent years as the parties are becoming more willing to seek change."

Finally, it should be noted that the severity of resistance to change varies from one agency to another. Agencies can also accept to share their data through the channel when they are aware of its importance and role. One participant explained this when he said: "Culture differs from one side to the other, but usually the perception of data sharing changes when the organization becomes aware of the desired benefit of the channel."

I. Leadership

The results indicated that the role of leadership in information sharing initiatives in Saudi Arabia is usually exercised by the higher committees of e-government transactions. In 2005, the Council of Ministers called on government agencies to set up their respective internal e-government committees. The decision was made on a motion raised by H.E the Minister of Communications and Information Technology. It was proposed that the committee should have five to seven members, including the highest official of each department in charge of e-transactions, the highest IT official, and the highest official in charge of administrative development at the respective agency. The committee was directed to report to the highest official in the agency. Implementing the directive, a committee was established in each agency and became responsible for IT plan implementation and supervision, requirements identification, and the coordination of all e-government initiatives with YESSER. One participant pointed out that most leaders in these committees are interested in connecting their agencies to GSB. He said: "Most leaders in internal e-government committees are keen to support the GSB initiative."

Another participant from one of the participating agencies also confirms the importance of leadership and ministerial-level support. He said: "The ministerial support and follow-up we have received from other parties, as well as the presence of qualified leaders in our ministry, have had a profound impact on the success of our efforts aimed at obtaining information from other agencies." Finally, the role of leadership was not present in all participating agencies as

one participant noted: "The role of leadership is very important but some agencies lack leaders who are able to drive efforts toward being a part of the GSB."

J. Additional Influencing Factors

The analysis of the GSB initiative identified three additional factors that influenced the orientation of the government toward sharing their data at the organizational level. These three factors include mimetic processes, e-government transformation measurement, and organizations' perception of data quality. The following paragraphs discuss these factors in more detail.

Mimetic pressures come from the pressure to imitate what others do. According to DiMaggio and Powell [34], when organizational technologies are poorly understood, or goals are unclear, or when the environment creates symbolic uncertainty, organizations may model themselves on other organizations. In this case, the analysis indicates that mimetic pressure has a positive influence and contributed to motivating unconnected agencies and changing their attitude towards participation in the GSB. A group of participants confirmed this. One of them said: "Some agencies are motivated by the participation of others in the channel." Another confirmed: "The pressures resulting from the progress of some agencies that connect and use the data available on the GSB have positively impacted on others who are not connected to it." Finally, according to another participant from the Yesser program, the more the number of entities associated with the channel, the greater the response from the rest of the agencies. He said: "It is noticeable that we get more responsiveness from the agencies as the number of connected agencies increase."

The second additional influencing factor is the e-government transformation measurement called "Qiyas" (Yesser). In reference to e-government application regulations issued pursuant to the cabinet's resolution no (40) dated 27/2/1427H and no. (252) dated 16/7/1431H regarding supporting and reinforcing the process of transformation into e-government in addition to the general provisions of such regulations included in clause no. (22), which states that each government agency must implement a biannual score measurement of how much it has achieved in the e-government transformation. Also, as stated in clause no. 23, a general biannual report should be prepared by the Yesser program to be sent to the Royal Majesty, pointing out how long government entities have achieved the e-government transformation in line with the indicators referred to within above-mentioned clause no. (22), and pursuant to all regulations, laws, and legislation relevant to the application of e-transactions within all government entities (2019).

Accordingly, the measurement initiative was launched to evaluate the factual status of e-government transformation. This included evaluating the government entities' internal e-transactions and all initiatives and programs relevantly executed to support this mission. Further, it included evaluating distinctive projects adopted to help develop government performance and ensure that services will be effectively and efficiently offered to citizens. The Yesser program has been in charge of periodically following up this measurement in accordance with a specified methodology and a set of indicators derived from local and international distinctive experiments.

One of the indicators included in the measurement was developed to measure the participation of each entity in the GSB. In other words, the overall ranking of the entity is influenced by the extent to which it shares its data through the GSB. Accordingly, the orientation of government agencies toward engaging with the GSB has been positively influenced as revealed in this case study. One participant from Yesser stated that: "Qiyas has greatly influenced the desire of agencies to join the channel. For example, last year, there was an agency that wanted to launch an eService before a scheduled visit by the "Qiyas" team, which made them communicate with us continuously to join the channel as soon as possible." Another participant confirmed the influence of the measurement initiative and said: "Entities are usually keen to connect to the GSB to meet the requirements of the measurement program." Also, one more participant highlights the fear from the reports produced by Qiyas initiatives and submitted to one of the highest authoritative councils in Saudi Arabia. He said: "There is a fear of measurement reports submitted to the Council of Economic Affairs and Development, which contributed to the increase in the number of entities associated with the channel."

The last additional influencing factor revealed by the study is organizations' perception of data quality. In fact, some agencies are willing to share data through the GSB. However, because of uncertainty of their data quality, they opt not to do so as sharing information might put their image under risk and fire back on them. Many participants pointed out this issue and highlighted it as one of the main factors preventing agencies from sharing their data through the channel. For example, one of the participants said: "Unfortunately, many entities do not have confidence in the quality of the data, which is why they refrain from sharing their data through the GSB."

VI. DISCUSSION

The GSB case shows evidence of all nine factors discussed in previous research. It also pointed to three additional factors. We tentatively conclude that all nine factors identified by previous researchers are present in the GSB regardless of any particular country. We further observe that the mimetic pressures, e-government transformation measurement, and organizations' perception of data quality have all influenced the CBIS, as revealed by this case study. The following bullets describe the main effects of each factor and propose strategies to deal with them.

- **Goals and Interests:** when agencies deal with their data as exclusive property, it becomes difficult to convince such agencies to share their data with others. Such an obstacle requires government intervention and policies to ensure government data is treated as a public resource and that no one has the right to retain and prevent others from taking advantage of it. Here, it is important to accelerate the

issuance of the Freedom of Information Act, which, it is hoped, will have a significant impact on guiding all government agencies towards sharing data through the GSB.

- **Trust and past relationships:** It is important to establish enough level of trust especially when you lack mechanisms to compel agencies to share their information, as in this case. Also, trust depends on the people who run the business as their behavior and cooperation determine the level of trust. Accordingly, relying on institutional trust during the initial stages of CBIS initiatives seems crucial. In this case, the prior agreements signed with agencies have accelerated the work.

- **Executive support:** The role of executives' support in promoting the success of CBIS initiatives was evident in this case. Engaging executives at the ministerial level helps provide support and overcome difficulties that may arise during the channel-linking process.

- **Risks:** Risks, in this case, were linked to three key aspects: the value of information as perceived by agencies; information security; and privacy. These aspects negatively influenced the orientation of some agencies toward sharing their information through the GSB. All these aspects are logical and require the creation of an appropriate environment to mitigate their effects. Hence some actions are required by the Yesser program. First, Yesser should take all appropriate measures to ensure information security and clarify these procedures to all parties. Second, it has to develop privacy policies and circulate them to all parties. This seems crucial to promote the participation of agencies in the GSB especially with the lack of privacy act at the national level.

- **Costs:** In this case, the cost of connecting an agency to the GSB was marginal. However, although the cost was marginal, the Yesser program initially assumed responsibility for funding the operation as part of an effort to motivate government agencies to share information through the channel. As we have noticed, with the passage of time and the increase in the number of entities associated with the channel, there was no longer any need to bear these costs by the program and agencies became more willing to take care of the costs.

- **Benefits:** It is difficult to be responsive to any effort without clear benefits. In this case, it is obvious the main benefit that could be obtained by the entities was to enable them to receive the information they needed to provide integrated electronic services. Hence, it is important to clarify this role of the channel and highlight all other benefits to promote the success of the GSB as a national initiative.

- **Authority and hierarchical structures:** The lack of data governance frameworks in most government agencies led to a lack of clarity of authorities and responsibilities for data-sharing decisions. This negatively influenced information sharing in this case. Therefore, guiding agencies towards building a data governance framework that clarifies responsibilities and authorities with respect to data is essential to enable these agencies to exchange their data and accelerate the process of linking them to the channel.

- **Organizational culture:** The culture of government agencies is usually characterized by bureaucracy and resistance to change. Hence, change management seems crucial to promote information sharing initiatives. In this case, some agencies were keen to remain in their status because of their fear of change. However, this orientation changed as time passed and agencies started recognizing the benefits of the channel. Accordingly, communicating the roles and benefits associated with participating in the GSB seems important.

- **Leadership:** Leadership plays a pivotal role in promoting information-sharing initiatives. In this case, the role of leadership was exercised by the higher committees of e-government transactions. Setting up such committees to lead e-government initiatives is one of the lessons learned in this case study. Most leaders in these committees were keen to support the GSB initiative.

- **Mimetic pressures:** In such cases, it is necessary not to rush the results and focus on those that can be easily linked and those that have important data. As time goes by and the number of entities associated with the channel increases, the pressure will be placed on others that denied engagement with the GSB. In this case, the pressures resulting from the progress of some agencies that connect and use the data available on the GSB have positively impacted on others who are not connected to it.

- **e-Government transformation measurement:** carrying out measurements at the national level could promote information sharing when these measurements involve indicators that measure information sharing. In this case, the orientation of government agencies toward engaging with the GSB has been positively influenced as agencies are usually keen to meet the requirements of the national measurement program.

- **Organization's perception of data quality:** In some cases, agencies may refuse to share their data because they believe that the quality of their data is poor. The danger is that these agencies may find it difficult to highlight this reason and therefore try to cling to other reasons. Hence, the role of the Yesser Program is important in assisting these agencies to carry out initiatives to update their data and mitigate the consequences that may arise as a result of sharing data with poor quality.

VII. Conclusions and Future Work

This study identifies the organizational factors influencing CBIS initiatives within the context of SA. The study provides additional evidence for nine influencing organizational factors that were evident in previous research. These factors include goals and interests of participating organizations, trust, executive support, risks, costs and benefits, authority and hierarchical structures, organizational culture, and leadership. Additionally, the study pointed to three additional factors that influence information sharing in this case. The additional factors include mimetic pressure, e-government transformation measurement, and organizations' perception of data quality. There is still much to learn about CBIS within the context of SA. This study was limited to one case and focused only on organizational context. In future research, we will explore the factors related to the technical and national contexts and explore their influence on this case.

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Summary

Exploring the Influence of Organizational Context on Cross-boundary Information-Sharing Initiatives: The Case of the Saudi's Government Secure Bus

[Hashim H. Alneami]

This study addresses the organizational factors influencing cross-boundary information sharing (CBIS) initiatives within the context of Saudi Arabia (SA). The study starts by synthesizing the pertinent literature toward implementing an integrated model for the organizational factors influencing CBIS. A qualitative research approach was used to guide the research and the data was collected using interviews and documentation. The study shows that the adoption of the Government Secure Bus (GSB), implemented to facilitate information sharing between government agencies in SA, is influenced by nine factors identified by previous research. These factors include goals and interests of participating organizations, trust, executive support, risks, costs, benefits, authority and hierarchical structures, organizational culture, and leadership. Additionally, the study pointed to three additional factors that influence GSB adoption. The additional factors include mimetic pressures, e-government transformation measurement, and organizations' perception of data quality.

This study identifies the organizational factors influencing CBIS initiatives within the context of SA. The study provides additional evidence for nine influencing organizational factors that were evident in previous research. These factors include goals and interests of participating organizations, trust, executive support, risks, costs and benefits, authority and hierarchical structures, organizational culture, and leadership. Additionally, the study pointed to three additional factors that influence information sharing in this case. The additional factors include mimetic pressure, e-government transformation measurement, and organizations' perception of data quality. There is still much to learn about CBIS within the context of SA. This study was limited to one case and focused only on organizational context. In future research, we will explore the factors related to the technical and national contexts and explore their influence on this case.

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Mohammed A. Gharawi, Hashim H. Alneami
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