CHALLENGES IN E-GOVERNMENT AND SECURITY OF INFORMATION

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Abstract: Due to the advances made in Information and Communication Technologies (ICT), e-Government users can easily use the available services from places and at time that are convenient to them through WWW browsers. To easily and securely provide the required services through Information Technology (IT) has been an important issue in e-Government. In this article, the authors propose an explicit classification of e-Government applications and some challenges and obstacles in e-Government considered from four perspectives. Finally, a comprehensive view of some critical success factors in e-Government is proposed.

Keywords: e-Government; Critical Success Factor; Internet; Security.

Introduction

The time for the electronic-based society has arrived. E-Government has received more and more importance and it can provide a non-stop government information services to citizens, enterprises, public officers, government administrations and agencies over a network. There are many issues in e-Government which need a careful examination such as security issues,[1,2,3] service requirements of e-Government,[4,5,6] e-Government model,[7,8,9,10,11,12,13] strategy and policy for e-Government,[14,15,16,17] and domain of e-Government.[18]

In this article, we focus on the challenges, obstacles, and Critical Success Factors (CSFs)[19] in e-Government. First of all, we have to consider all of the participants in an e-Government system. According to the involved communities, an explicit classification of e-Government applications is proposed. It provides a way to an understanding of the challenges and CSFs in e-Government. Further detailed classification of e-Government applications is provided in a subsequent section. Then the challenges and obstacles in e-Government are considered from four perspectives. The CSFs of e-Government are described next. Finally, the last section provides conclusions and outlines future research directions.

An Explicit Classification of e-Government Applications

In order to develop an e-Government system, first, all of the users that may use the e-Government system have to be known. Therefore, the authors have defined four basic involved communities: Government, Officeholder, Citizens, and Business. All of the applications in an e-Government system will be developed in accordance with these four communities. An explicit classification of the e-Government applications is illustrated in Figure 1 and the detailed description of each e-Government application is as given below.

Government-to-Government e-Government (G-to-G e-Gov)

Government-to-Government e-Government (G-to-G e-Gov) supports the exchange of information between the inter-organizational governmental departments, such as the system of official documents received and dispatched.
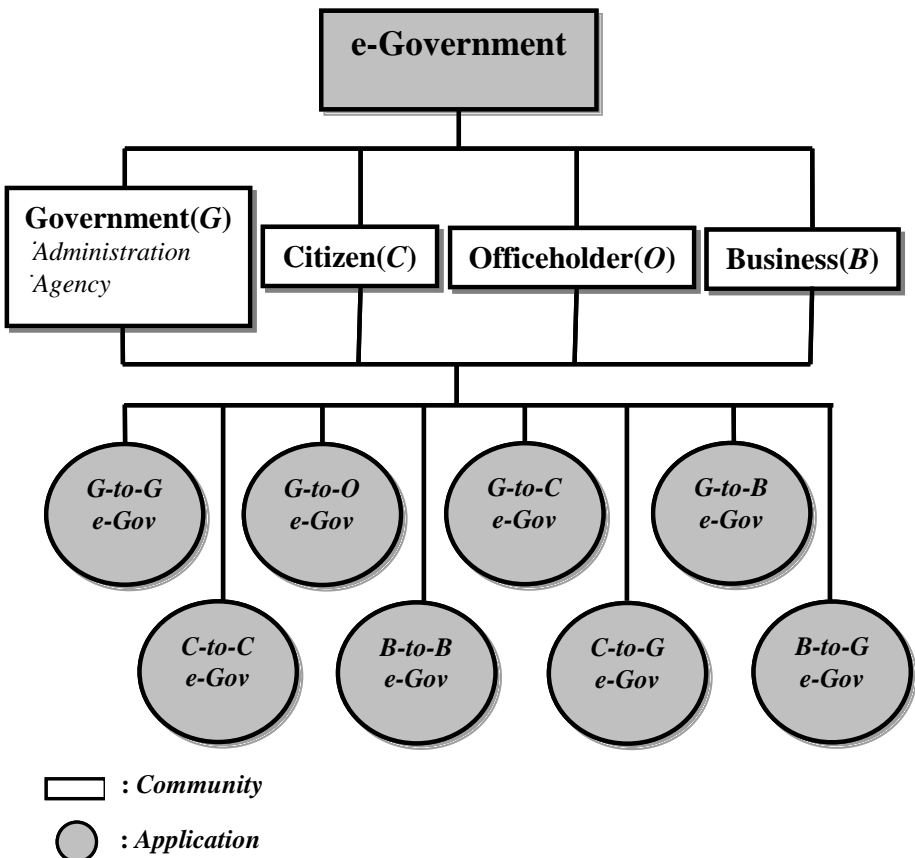

Figure 1: An Explicit Classification of e-Government Applications.

Government-to-Officeholder e-Government (G-to-O e-Gov)

Government-to-Officeholder e-Government (G-to-O e-Gov) supports intra-organizational government officeholders, public affair organizations, and secondary organizations' cooperative processes and procedures of public affairs.

Government-to-Citizen e-Government (G-to-C e-Gov)

Citizens are aware of the services provided by the government through the communication network and use the service with their personal identities through secure mechanisms. E-Voting and e-Assistance are two examples.

Government-to-Business e-Government (G-to-B e-Gov)

Businesses are aware of the services provided by the government through the communication network and use the service with a legal person's identity through secure mechanisms. Examples are on-line customs declaration of goods or on-line clearance of goods.

Citizen-to-Citizen e-Government (C-to-C e-Gov)

In Citizen -to- Citizen e-Government, the Government acts in a mediator role for the exchange of information. Typical examples are the following ones: the Government acts as a trouble-shooter in citizens' dispute or the Government offers temporary jobs to the victims of a disaster, so they could work in the public sector or private businesses. In this type of application the Government is a mediator that offers help in terms of manpower and information.

Business-to-Business e-Government (B-to-B e-Gov)

Similar to the above-described application of C-to-C e-Government, in Business-to-Business e-Government the Government plays an intermediary role in the exchange of information. For example, the Government could invite the business to bid for contracts that contain sensitive information. These businesses might produce the country's weaponry, such as tanks, warships, and warplanes.

Citizen-to-Government e-Government (C-to-G e-Gov)

These electronic communities are formed based on the demand of the citizens (demand aggregate-driven). Citizens request assistance or give suggestions to the citizenry, for example.

Business-to-Government e-Government (B-to-G e-Gov)

Similar to the above-mentioned application of C-to-G e-Government, electronic communities are formed on the basis of the demands of the business (demand aggregate-driven). Businesses ask for governmental patronage or proposals from other businesses, for example.

Challenges and Obstacles in e-Government

Considering the types of applications of e-Government described in the previous section, the authors demonstrate some challenges and obstacles to e-Government viewed from four perspectives: technical, political, cultural, and legal aspects. There is some difference between the aspects proposed here and the four aspects proposed by Wimmer and von Bredow[20]: social, political, cultural, and legal aspects. The challenges and obstacles in e-Government are illustrated in Figure 2 and further explanation of the challenges and obstacles in e-Government is provided below.
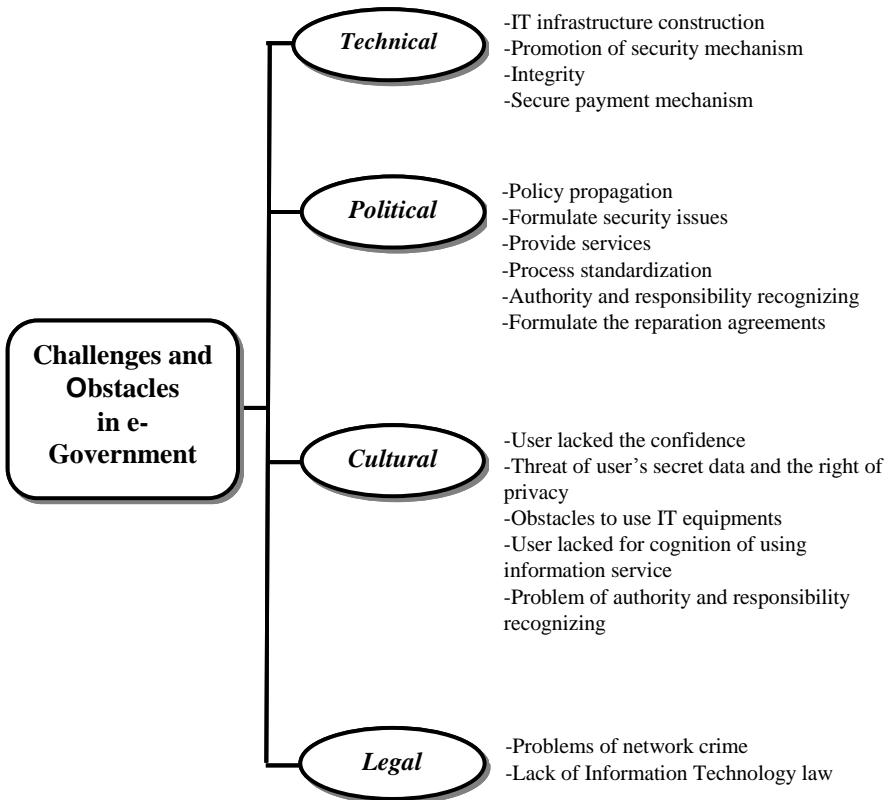

Figure 2: Challenges and Obstacles in e-Government.

Technical Impacts

In order to introduce and promote e-Government, the first and very important step is to construct the relevant IT infrastructure. This is a requirement very similar to the

relationship between advances in urban development and the construction of appropriate road infrastructure. Furthermore, system and security requirements, such as integrity, secure payment mechanism,[21,22,23,24] and promotion of security mechanism, are pertinent to e-Government as well.

Political Impacts

As is evident from Figure 2, there are many political issues that have to be considered. In this aspect, the services and processes need careful consideration. If the e-Government can provide a rich variety of different services (e-Justice for example) it will be more acceptable and convenient to users.

From the user's point of view, process standardization is a must and the simple principle "easy-to-use" has to be kept. Finally, the agreements of reparations, authority, and responsibilities have to be clearly formulated and recognized in order to protect the user's right.

Cultural Impacts

From this perspective, the challenges and obstacles in e-Government bring a lot of difficulty because it involves the human psychological factor. Therefore, the e-Government should not make any mistakes here, or otherwise it fails. Furthermore, the important principle—"easy-to-use"—has a great influence on the success of e-Government. This principle could advertise and promote e-Government and it will allow more people to use the e-Government services. In short, even illiterate people can use e-Government without any worries.

Legal Impacts

This aspect embraces a lot of problems related to networking crime and security threats,[25] such as hacker attacks, viruses, masquerades of unauthorized identity, and computer forgery. Furthermore, there is a shortage of relevant law in Information Technology.

Critical Success Factors in e-Government

In accordance with the e-Government challenges and obstacles described in the previous section, the critical success factors (CSF) in e-Government have to be investigated thoroughly. Therefore, we demonstrated thirteen CSFs in e-Government, as illustrated in Figure 3. These CSFs in e-Government are considered from a comprehensive view, including users, process, hardware/software, and legal views.

From the user's perspective, the government has to be greatly supportive and promoting first of all. Furthermore, it should have a high acceptance of users, clearly de-

fined authority and responsibility of users and it has to enhance the user's information technology skills. Besides, the diversification of electronic means is very helpful to e-Government, such as wireless communication, net-meeting, video conferencing, and video telephones. From the process view, high security, standardization and knowledge management are a must for e-Government; then come the provision of specific services and the emphasis of its quality. Furthermore, the establishment of national

CSFs in the e-Government

(1) **Great support and promotion from the Government and its policies**

(2) **Acceptance of users – easy to use**

(3) **Legality and protection of law**

(4) **High security**

(5) **Standardization**

(6) **Clearly defined authority and responsibility of users**

(7) **Provide specific services and emphasize its quality**

(8) **National authentication center**

(9) **National file management center**

(10) **Popularity of IT infrastructure construction**

(11) **Enhance the user's information skill**

(12) **High integrity and high domination of the e-Government systems**

(13) **Diversification of electronic messages**

(14) **Knowledge management**

User's view

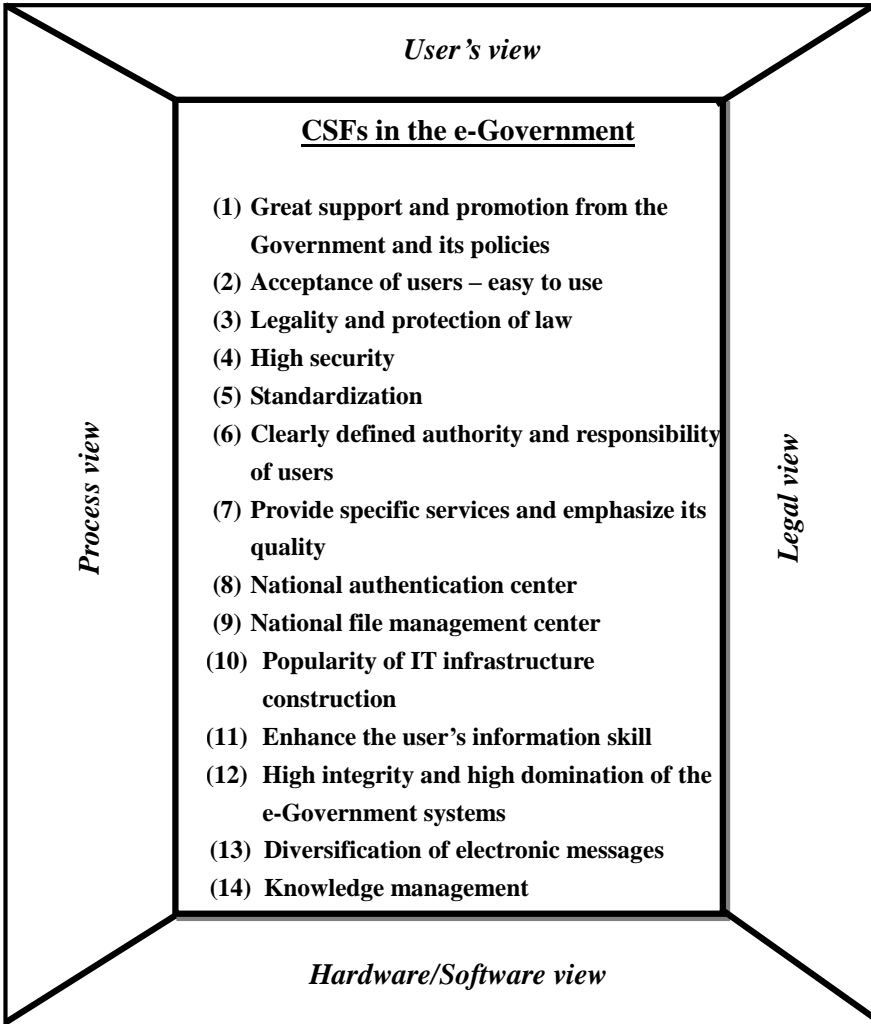*Process view*

Legal view

Hardware/Software view

Figure 3: CSFs in e-Government from a Comprehensive View.

authentication centre is an essential requirement, so as the users could use the services with their personal identities and all transactions are recorded in the national file management centre in order to protect the electronic documents from any damage. From the legal point of view, it is necessary to legislate for legitimacy; hence all people are equal before the law. Finally, from the hardware/software point of view, popularizing the IT infrastructure construction is essential for e-Government. In addition, it is important to enhance the integrity and the dominance of the e-Government system.

Research Issues

As to the future research work, the authors have outlined some research issues for further detailed consideration as follows. Included are security issues, issues of services provided, and the e-Government model.

- Security issues:
    - Identification of security requirements[26]
    - Attribute Certificates (AC)[27]
    - Public Key Infrastructure (PKI)[28,29,30]
    - Certification/Authentication[31,32,33,34,35]
    - Risk analysis and Metrics for e-Government[36]
    - Database Security[37,38,39,40]

- Issues of services provided:
    - E-Learning in e-Government[41]
    - E-Procurement in e-Government[42]
    - Semantic Web for e-Government[43]
    - E-Voting in e-Government[44]

- E-Government model.[45,46,47,48]

Conclusion

In this article, the authors have proposed an explicit classification of e-Government applications according to the involved participants in an e-Government system. Further, the authors have demonstrated the challenges and obstacles in e-Government considered from four aspects: technical, political, cultural, and legal aspects. In addition to outlining the challenges and obstacles in e-Government, they have proposed thirteen CSFs in e-Government from a comprehensive view: user, process, legal and hardware/software views. Finally, developing practical solutions in e-Government is a very interesting subject for further investigation and discussion.

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