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Research paper

Applicability of the Sustainability Model for Measuring the Success of Electronic Government Services

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Abstract

The Information and Communication Technologies (ICT) bring new challenges as well as a risky environment for sustainable development. In recent years the electronic government (eG) system has become an important component of Information Communication Technology provided by governments to sustain and facilitate all the transactions. Clearly, there is a lack of studies that identify the most important criteria of sustainability model of eG projects in specific and electronic project (e-project) in general. Additionally, the absence of an established model to measure the sustainability in developed and developing countries too. Therefore, this study attempted to design and validate sustainability model by examining the current situation of eG services in Iraq, a country characterized by an unstable environment. To examine the sustainability model, the data for this study were collected from the employees in public universities. Out of 700 questionnaires distributed, 436 questionnaires returned were useable. The findings of the study confirmed that the top important criterion that affects the sustainability of eG is the availability of services, especially the awareness of the availability of eG services. This is followed by cost, routine, speed, time, benefit, flexibility, and finally satisfaction. The findings make another contribution to the academic literature on sustainability performance measures electronic project. In sum, this study demonstrated that the sustainability model is valid and can be utilized to examine sustainability towards various electronic projects in diverse cultures among different nations.

Keywords: *Sustainability, Electronic Projects, Information and Communication Technologies, Success, Risky and Risky Environment.*

1. Introduction

The evolution of Information and Communication Technologies (ICTs) has observed the development of Electronic Government (eG) in the late 1990s (1, 2). Nowadays, eG services received the attention of many Information System (IS) researchers worldwide (3, 4). Examples of studies in developed nations include the United Kingdom (UK) (5), United States of America (USA) (6), Sweden (7), Singapore (8), and Taiwan (9). Examples in developing nations include Malaysia (10, 11), Indonesia (12), and Thailand (13). In the Middle East, examples include Jordan (14), Saudi Arabia (15), Qatar (16, 17), Kuwait (18) and Iraq (4, 19). In details, the eG provides numerous types of services to beneficiaries of government services. The differences of the services depend on the users' desires and ICT skills, and this has led to the development of different types of eG channels namely, Government to Employees (G-2-E), Government to Government (G-2-G), Government to Business (G-2-B) and Government to Citizen (G-2-C) (4). The popularity of the adoption of eG services in developed and developing countries is evident along with the increasing attention that has been given to the sophistication of eG in the current times (20).

2. Conflicts Context

Recently, environmental challenges have become increasingly complex and unstable wide world, therefore many studies involved environment as a fundamental factor affecting the sustainability of projects (21-23). As one of the unstable countries in the world, Iraq has been suffering from long-term internal crisis (conflicts and violence) that led to big loss of lives and properties and as such, it has been considered as one of the most dangerous and unstable countries in the world (24, 25). More specifically, Iraq is classified as a developing country categorized under a redeveloping stage (26). Many crises, difficulties and hard conditions have been encountered in Iraq, such as the economic sanction and currently, conflicts and domestic violence situation. This study pays significant attention to the instability as a fundamental factor for sustainability of eG system usage in Iraq. Therefore, this study contributes to the academic literature by answering the following main questions:

-What criteria are used to measure the sustainability of electronic projects in a risky environment?

3. Related Work

Current studies extend the previous studies from different perspectives. Success and sustainability of electronic project in redeveloping stage countries.

Sustainability and Success of Electronic Project

In fact, numerous studies address that many projects have failed totally or partially (27-29) and there is a clear gap in information systems literature regarding a mechanism to assure their sustainability and success (30). Evidence from eG services projects in developing countries stated that more than 50% of projects either succeed only partially or fail completely in achieving their targets (29, 31). So, how can these projects be made more sustainable and more successful in long term. In other word, due to the importance of the sustainability of information system and regarding the dilemma of sustainability and success, researchers discovered a high rate of failure in eG implementation (29, 31). For example, successful eG projects in developing and transitional countries constitute only 15% of all projects, 50% were partial failures and 35% were total failures (29, 31). These results are presented in Table 1.

Table 1. Failure and Success Rates for eG Services. Heeks (31) and Krishnan (29)

Classification	% for developing countries	% for developed countries
Partial failure	50	33-60
Success	15	15-47
Total failure	35	20-50

The failure rate of the eG project in developing countries as reported by the United Nations (2003) is estimated between 60%-80%, including most of the Middle Eastern countries. The report also indicates the lack of eG projects in Iraq (32). Furthermore, there is a lack of studies that identified the most important causes of sustainability or the success and failure of eG projects (33, 34).

The Sustainability and Current Situation of Electronic Project Via Electronic Government Services in Iraq

Nowadays, there is a need for a specific tool to measure the sustainability of technology among differ projects. There is also increasing concern with sustainability, the impact of electronic projects on the environment as well as the additional traditional aspect of economic development. Until recently, there has been a lack of study that focuses on sustainability model of electronic project in general. However, one of the objectives of the study is to produce and understand the sustainability and current state of electronic government services via eight criteria. Although many researchers have addressed the issues of sustainability in several different countries (21, 35, 36), these studies were relatively incomplete. There are other potential criteria that need to be considered. Most of these variables, which have been tested in another context and technologies, may also influence the sustainability of eG. Among these criteria include availability of eG services, satisfaction, benefit, routine, cost, time, flexibility and internet speed in Iraq. These are diagrammatically represented in Figure 1.

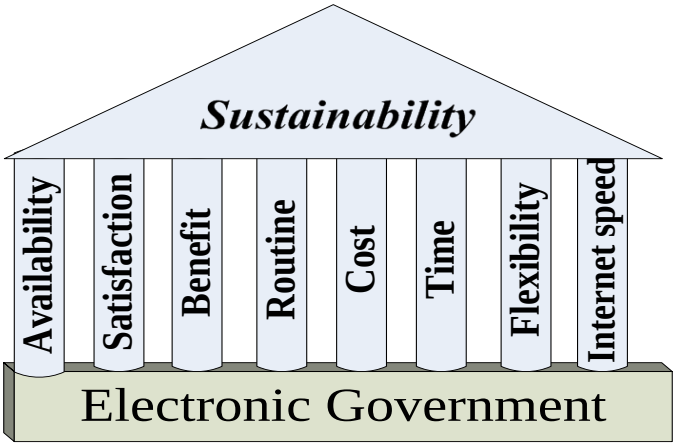

Figure 1. Sustainability Model of Electronic Project via Electronic government Services in Iraq.

Methodology

The current study considers several variables that influence the sustainability of using eG services among Iraqi users. In Addition, the research methodology is largely dependent on the strategic plan that comprises procedures of data collection and analysis about a certain population in an attempt to find a solution to the problem statement (37). The present study aims to measure the sustainability of electronic projects in a risky environment such as republic of Iraq. Moreover, a quantitative approach is considered suitable in meeting the research objective.

Additionally, it was regarded by Zikmund et al.(39) that in order to determine the solution to the problem statement, it is important that the unit of analysis from which the response is planned to be obtained must be first identified. The unit of analysis is the level of aggregation of the data to be collected in the data analysis step. It may comprise an individual or an organization. In the context of the present study, individual (university employees) is considered the unit of analysis as it is the individual user that makes use of eG services in terms of G-2-C services. More importantly, employees in public universities are requested their opinion concerning eG services in an unstable environment. Consequently, considering the employee as the unit of analysis in the present study is consistent with its objectives.

The final data sample included the staff (lecturers and administrative) in public universities. The sampling profile showed that the sample is a representative of the population under study.

Based on the analysis, the study has categorized the respondents into eight demographic variables in the sample according to their age, gender, marital status, current occupation, residential area, education, income and duration of Internet usage (experience) is listed in Table2.

Table 2 Participant's Demographic Information

Demographic Variable	Category	(*N* = 436) Frequency	Percentage %
Gender	Male	222	50.9
	Female	214	49.1
Age	≤ 22	15	3.4
	23 -35	182	41.7
	36- 45	156	35.8
	46-55	67	15.4
	56 or above	16	3.7
Marital status	Single	114	26.1
	Married	297	68.1
	Divorced	15	3.4
	Widowed	10	2.3
Current Occupation	Lecturer	158	36.2
	Manager	56	12.8
	Officer	178	40.8

	Clerks	23	5.3
	Others	21	4.8
Residential Area	City/Urban	307	70.4
	Rural	129	29.6
Education level	PhD	74	17.0
	Master	104	23.9
	Bachelor	172	39.4
	Diploma	58	13.3
	Secondary School	21	4.8
	Read and Write	6	1.4
	Other	1	2
Monthly Income in ID (Iraqi Dinars)	≤ 250 (Thousand)	17	3.9
	251 - 500(Thousand)	61	14.0
	501-750(Thousand)	130	29.8
	≥751 (Thousand)	228	52.3
Duration of Internet usage	Less than a year	94	21.6
	1-3 years	148	33.9
	More than 3 to 5 years	87	20.0
	More than 5 years	107	24.5

(1 Dollar = 1200 Iraqi Dinars)

Table 2 shows the respondents who responded to this study. Importantly, the objective of this study was to understand the current state of eG services in Iraq. By using eight items, the researcher used the dichotomous scale to obtain "yes" or "no" (38) as illustrated in Table 3.

Table 3. The measurement and the status of eG services sustainability in Iraq

Current *eG* Status in Iraq	**Answer**	**(N = 436) Frequency**	**Percentage %**
Availability of services: I am aware about the availability of eG services in Iraq.	Yes	353	80.5
	No	83	19.5
al		436	100.0
Satisfaction: In general I am satisfied with the current eG services in Iraq.	Yes	226	51.8
	No	210	48.2
al		436	100.0
Benefit: I am aware of the benefits of the current eG services in Iraq.	Yes	317	72.7
	No	119	27.3
al		436	100.0
Routine: eG services reduce the normal administrative routine in Iraq.	Yes	327	75.0
	No	109	25.0
al		436	100.0
Cost: Usage of current eG services decrease the cost of citizen transaction.	Yes	334	76.6
	No	102	23.4
al		436	100.0
Time: Use of current eG services enable me to complete transactions more quickly.	Yes	318	72.9
	No	118	27.1
al		436	100.0
Flexibility: The current eG services are flexible	Yes	254	58.3
	No	182	41.7
al		436	100.0
Internet speed: eG services are affected by Internet speed.	Yes	327	75.0
	No	109	25.0
Total		436	100.0

The information about the current eG status and sustainability were gathered through a study survey. Respondents were asked to provide information related to eG services in conflicted and unstable environment. Eight questions related to the availability of eG services, satisfaction, benefit, routine, cost, time, flexibility and internet speed were asked. The first item discussed the availability of eG services in Iraq. The obtained results from 436 respondents indicated that most of the respondents that participated in the availability of eG services in Iraq answered "yes" (353) as shown in Figure 2. These results showed that more than 80% of the respondents confirmed their knowledge about the availability of the services in Iraq. Moreover, the importance of awareness about eG services was confirmed by the recommendation of users in the study questionnaire.

Moreover, the second question is related to the satisfaction toward to eG services and 226 respondents (51.8%) answered "yes" as shown in Figure 3.

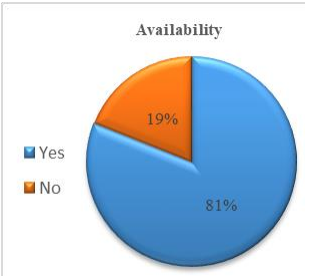

Figure 2. Availability of Electronic Government Services

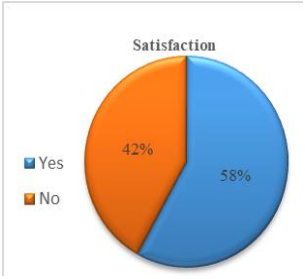

Figure 3. Satisfaction of Electronic Government Services

Additionally, question number three related to the benefit of eG shows that 317 of the respondents indicated "Yes" and 119 gave a "No" response. This means that the respondents were satisfied and get benefit with the current services compared to the past because in the past there were no services at all. Further explanation is given in Figure 4 as shown below.

For the fourth question, the researcher examined how eG services reduce the normal administrative routine in Iraq. Table 2 shows that 75% agreed while 25% disagreed to question number four. These are presented in Figure 5.

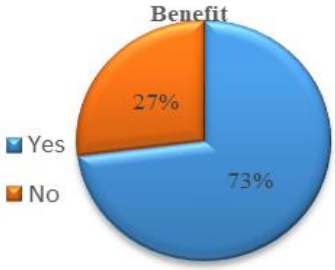

Figure 4. Benefit of Electronic Government Services

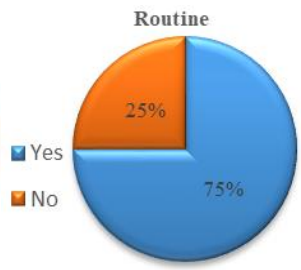

Figure 5. Routine of Electronic Government Services

Question number five is about how cost (35) of usage of current eG services decrease the cost of citizen transactions in Iraq; 73.7% of the citizens answered "yes" and 22.5 answered "no". Figure 6 shows that eG services currently available are reducing the cost of citizen transactions in Iraq.

In terms of the current eG services in Iraq, the sixth question investigated and tested the time of the services achieved; 72.9 % of the respondents answered "yes" but 27.1% answered "no". Figure 7 shows briefly that eG services are faster than traditional way or old way (by going to the office and meeting face-to-face with the employee, getting an appointment, etc.) from the users' (citizen) perspective.

Figure 6. Cost of Electronic Government Services

Figure 7. Time of Electronic Government Services

Figure 8 illustrates question seven that investigates the flexibility of the current eG services and 58.3 users said "yes" and 41.7% answered "no".

Finally, for the eighth question regarding the Internet speed, the item tested how the eG services are affected by Internet speed among users, and 75.0% of the users answered "yes" and 25.0% users answered "no" as shown in Figure 9.

As mentioned, despite the government's support of the infrastructure in Iraq, the use of eG services among Iraqis is nevertheless affected by violence and conflicts environment. This shows that three-quarters of Iraqis know how internet speed affects the online services.

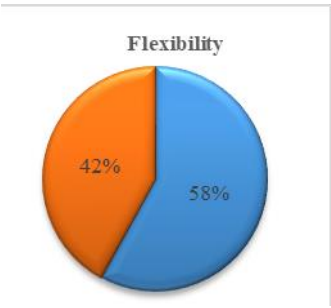

Figure 8. Flexibility of Electronic Government Services

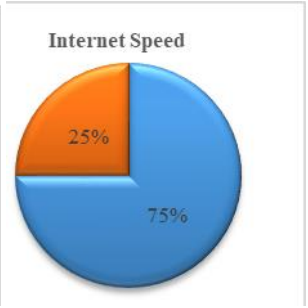

Figure 9. Electronic Government Services are Affected by Internet Speed

Results

The findings make clear contribution to the academic literature on sustainability performance measures eG and point to electronic project measures that may lead to improvements in practice. Also, this study has many others valuable theoretical and practical contributions. This study attempted to examine the influence of availability, cost, routine, speed, time, benefit, flexibility, and finally satisfaction on the sustainability of eG project. The uniqueness of this study comes from the examination of different criteria and testing of its effect on the sustainability of eG in the unstable environment. Thus, this study contributed by proposing a new model to test and examine the sustainability of electronic projects in general and electronic public projects in specific, via eG services. Also, this study has many contributions to the body of knowledge in the area of eG services in an unstable environment. First, this study provides a new model to measure the sustainability by understanding how the criteria (availability, cost, routine, speed, time, benefit, flexibility and satisfaction) are important in explaining the sustainability of eG in the Iraqi context. More specifically, this study explored how the joint effect of the aforementioned criteria can affect the sustainability of electronic projects in general. Second, most of the past studies that examined the sustainability of eG were conducted in the developed countries and very few studies have considered the context of the developing countries. However, this study attempted to examine the sustainability of electronic projects via eG in an unstable country, namely Iraq, a country located in the Middle East region. The implications could be useful for research, policy, and practice of eG service adoption in conflict zones. The implication of this is the more the measuring of eG services, the higher expected performances of the users of eG to achieve the sustainability. This finding justified the usage of eG services as an effective mean of bridging the digital divide in different regions of Iraq. Additionally, this study confirmed that the proposed sustainability model can be utilized to examine sustainability towards electronic projects in diverse cultures. In general, this study is one of the few studies derived in the Arab world to validate the sustainability of the electronic project.

Conclusion and Limitations

In conclusion, the study presents how the current research objective has been reached in light of the previous elaborated discussion of results. This study designed to develop a new criterion of measuring the electronic projects, which is deemed important for the further development of sustainability research. In the research criteria, the results obtained from investigating, testing and analyzing the set of criteria, provide invaluable information to electronic government managers and practitioners in develop and developing nations. Although this study has generated findings, it does, however, have certain limitations; first, this study reports a limitation relating to sample size and amount of universities in the present study, which is relatively small. Additionally, this study tests only specific employees working at the public universities in Iraq. Consequently, the results of this study do not reflect the behavior of other departments such as school teachers, private universities, students, agriculture sector, industrial sector and military sector. In line with the previous discussion, there is a clear luck in the studies which concern on electronic services adoption and/or acceptance among real effected peoples by civil conflicts like IDP Internally Displaced People.in deed there is a need to fulfill this gap. Also, this study focused on the examination of the status that affects the sustainability of eG only.

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