

جامعة السودان للعلوم والتكنولوجيا

Sudan University of Science and Technology

The College of Computer Science and Information Technology

**Expectations and Challenges of Implementation of
e-Services by Local Government**

التحديات و التوقعات في تطبيق الحكومات المحلية للخدمات الإلكترونية

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A research submitted in partial fulfillment of the requirements for the
degree of

Maser of Computer Science

(Regulations and Policies of Information Communication Technology)

(ماجستير تنظيم وسياسات تكنولوجيا المعلومات و الإتصالات)

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ABSTRACT

E-Government presents a new and innovative approach to addressing traditional problems of government services utilizing the Internet and World-Wide-Web.

This research reflects on the local- government need to implement and improve their the ICT capabilities, and deliver e-services to the citizens. The local -government is one of the main links between the citizens and state. and local-government as independent manage unit have been largely left out of the state development process of making digital management and e-services more efficient.

E-government initiatives utilize Information and Communication Technology to improve public services and information access to citizens and users. This paper presents a description for the role of web sites in the context of the e- government perspective. Within this context, the core tasks of a web site of a public entity are proposed along with guidelines for implementation. Based on the core tasks proposed in this research, guidelines and tools are described to guide assessing public sector websites. Six websites are evaluated according to this paper proposal and comparison results are presented.

Keywords—e-government; websites, tasks and evaluation

المستخلص

أحدثت الحكومة الإلكترونية ثورة في مجال الخدمات الحكومية باتباعها نهج جديد ومبتكر في معالجة المشاكل التقليدية للخدمات الحكومية بواسطة استخدامها لتكنولوجيا المعلومات والاتصالات و الإنترنت الحكومة المحلية هي رابطة مهم بين الدولة والمواطن، هذا البحث يعكس مدي احتياج الحكومة المحلية لتنفيذ وتحسين قدرات تكنولوجيا المعلومات والاتصالات لتقديم الخدمات الإلكترونية للمواطن مبادرات الحكومة الإلكترونية هي استخدام تكنولوجيا الاتصالات والمعلومات لتحسين الخدمات العامة وحصول المواطنين والمستخدمين علي المعلومات، هذه الورقة تقدم وصفا لدور المواقع علي شبكة الإنترنت في سياق منظور الحكومة الإلكترونية، وفي هذا السياق يقترح المهام الأساسية للمواقع علي شبكة الإنترنت جنباً الي جنب مع المبادئ التوجيهية للتنفيذ. واستناداً الي المهام الأساسية المقترحة في هذا البحث تم وصف مبادئ توجيهية وادوات لتوجيه كيفية تقييم مواقع القطاع العام. ويتم تقييم ست مواقع وفقاً لهذه الورقة حيث يتم عرض الاقتراح ومقارنة النتائج

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Chapter One

1-Introduction:

1.1 Research Background

The advances made in Information and Communication Technology during recent decades have brought huge changes to economics, business, politics, and almost all aspects of human life. Telecommunications and the Internet are the most apparent, ubiquitous tools operating in our daily life. Business and service organizations and firms, in addition to governments at all levels, have to respond to these changes, making use of ICT itself to improve their services and attain people's satisfaction. This requires creating new and innovative ways to electronically do business and deliver government services. These are known now as e-business and e-government.

E-government in principle is not a technical exercise or goal, but rather a tool to achieve better government services. There are many definitions of e-government in the literature, according to those definitions we can define the e-government from several perspectives :

“Electronic government refers to government’s use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities”.[2] (Layne, Lee, 2001)

“E-government is defined as utilizing the Internet and the world-wide-web for delivering government information and services to citizens.”(United Nations)

E-government means utilizing a variety of the Internet-based IT to achieve administrative objectives. The Internet is crucial, enabling one-to-many interaction between the government and people. (Snellen, 2005:399, Holmes, 2001:2, Peristeras et al., 2002: 4).

e-government includes the use of all information and communication technologies, from fax machines to wireless palm pilots, to facilitate the daily administration of government. However, like e-commerce, the popular interpretation of e-government is one that defines it exclusively as an Internet driven activity ... to which it may be added “that improves citizen access to government information, services and expertise to ensure citizen participation in, and satisfaction with the government process ... it is a permanent commitment by government to

improving the relationship between the private citizen and the public sector through enhanced, cost-effective and efficient delivery of services, information and knowledge. It is the practical realization of the best that government has to offer.

(UN and ASPA 2001, 1)

The main components of infrastructure for implementing e-government include provision of Internet accessibility to the citizens, availability of digital content and interoperability legislation and technology.

Websites represent the most common and popular way for users to access information on the Internet. Currently, governments at national, regional and local levels are required to use their websites to provide citizens with channels to access data, information and services, and further offer more opportunities to engage the public participation in decision-making processes and evaluation, while furthermore maintaining transparency[1 web sites].

In terms of Technology, ICT-based solutions offer various options that, in theory, should lead to effective government services. Despite those ICT advances and the availability of technological solutions, however, there are failures and monetary waste in many projects in the public sector, especially in the developing countries. There are huge challenges in implementing e-government.

1.2 Research Scope:

This research is examining the role of websites in the context of the e-government perspective

The research focuses on two types of government domains such as : government-to-business (G2B) and the government-to-citizen (G2C) domains.

1.3 Research Aim:

This research focuses on perspectives of local citizens and their interaction with local government. The research work will expose the demand and needs of the citizens from the local governments on one side, and on another side, the requirements and challenges that need to be taken into account to enable local government to provide e-services and improve the delivery of services to citizens.

The research in particular considers situation in developing countries. It uses approaches can be effectively used in countries

without sophisticated e-services systems. To do this, we focus on the role of websites to provide government services.

1.4 The objectives:

Using a citizen-centric approach to gain deep insight into possible e-services by local governments, this research aims at identifying effective e-services that would improve quality of services, and define needs and requirements for the local that enable them to successful implementation of e-services to their citizens. Challenges and expectations of local government performance in the broader framework of e-government will also be exploited. In relation to an effective role of websites in the public sector, the research seeks to do the following

- Review and describe the tasks of e-governments and initiates
- Rescribe the a generic role of web sites, and propose a tasks model for web sites in the context of e-Government initiates..
- Verify the proposed websites tasks model in real world context.

1-5 Methodology:

The focus of this research is to present a clear definition and describe the role of websites for the public sector, thus our interest in definitions of e-government tasks. One approach is that of the European Union, which has characterized four main tasks for e-government: development of Internet-based services to improve access to public information and services; improvement of transparency of public administration by using the Internet; full exploitation of information technology within public administration and establishing e-procurement[6] (Strejcek & Theilb, 2003).

There are many technological solutions and tools available for implementing e-government, hence paving the way to enhance services to citizens in terms of quality and time efficiency, simultaneously producing greater transparency, resulting in increased trust in government and employee activities.

In this research, we investigate the tasks meant for e-government implementation, and define tasks of websites in the context of clear definition of the main tasks and objectives of e-government. We describe three (3) distinct tasks for public sector websites. We also summarize the main categories and elements which are available to address those tasks. Furthermore, we introduce guidelines that can be used to design and assess websites.

Chapter Two

Literature Review: On e-Government Initiatives and Goals

2.1 e-government Objectives:

E-government vision and objectives should be linked with specific project according to priority setting for this project .

In many countries, the E-government vision includes enhancement of national competitiveness, facilitation of market economy, promotion of participatory democracy, and improvement of quality of citizen lives by reducing governmental failures, and mitigating the limitation of the representative democracy. Such vision can be realized by accomplishing specific objectives such as the efficiency of public administration, responsiveness of civil services, transparency in policy processes, and people’s participation. The vision and objectives of E-government should be linked with specific strategies and methods related to priority setting and resource distribution for the project. (© UNESCO 2006 Published by Communication and Information (CI) in Asia

2.2 Maturity Model of E-government :

UN Model is content 5 levels of e-government : 1) Emerging, 2) Enhanced, 3) Interactive, 4) Transactional, 5) Seamless (UNDPEPA/ASPA, 2002:2).

the interaction between the government and people in the policy decision-making process goes through 3 levels of evolution in OECD model,; 1) one-way information provision, 2) two-way consultation, 3) active participation based upon partnership (OECD, 2004).

Maturity	Objects	Citizen/government communication	Communication methods
Information	Government information	One-way	Website (portal)
Consultation	Government service	Two-way	E-civil service, CRM
Active participation	Public policy	Partnership	Cyber forum, E-voting

Source: OECD(2001), Engaging Citizens in Policy-Making: Information, Consultation and Public Participation, PUMA Policy Brief, No.10, July.

2.3 e-government Strategic Goals :

E-government aims transform the failed government into the competitive through achievement competitive market, democratic government, and common values (© UNESCO 2006 Published by Communication and Information (CI) in Asia United Nations Educational, Scientific and Cultural Organization UNESCO Bangkok 920 Sukhumvit Rd., Prakanong)

Competitive Market Values: Efficiency and Effectiveness : the government continuously seeks to achieve efficiency and effectiveness, which means getting a great result by inputting little financial and human resources

Democratic Government Values: Transparency and Accountability : E-government contributes to achieve transparency and responsibility through information dissemination. transparency plays a crucial role in preventing the corruption of the public sector, securing peoples right to know and access to information, improving the quality of democratic policy decision-making processes, justifying the distribution of social resources

Civil Society Value: Participation : E-government can facilitate participation through electronic media, allowing representative democratic system to overcome its limitation and to secure procedural rationality in policy processes.

2.4 e-government Technological Resources :

There are three technological components :

Key Components : functions of the technical factors classified in to tow internal

tasks of the government and delivering civil services can be done using ICT as media

The major technical factors include technologies on networks, computers, software, and data.

- High-speed network infrastructure including LAN, WAN, and MAN
- Computing facilities: high-end and personal computers
- Operating systems and application software
- Cellular phones and other communication devices
 - Domain name policy for the Internet

Interoperability : E-government requires a government-wide architecture

for integration and linkage

Internet Domain Name Policy : Internet domain name policy becomes very important. Like offline transaction, on-line transaction also requires a name and an address of the actor.

Through Websites the governmental bodies can provides information , e-Services and organization information and goals. So, e-government website is a tool designed to support the activities of governmental bodies.

2.5 E-government and Public Sector Web Initiative :

, website is one of major aspects of the e-government ,e-government includes four major internal and external aspects: (1) the establishment of a secure government intranet and central database for more efficient and cooperative interaction among governmental agencies; (2) Web-based service delivery; (3) the application of e-commerce for more efficient government trans- action activities, such as procurement and contract; and (4) digital democracy for more transparent accountability of government (Government and the Internet Survey 2000). Government and the Internet Survey. Handle with Care. 2000. The Economist 355(8176).

e-government design the Web sites to make it easier for citizens to find desired information. current efforts on government Web site design mainly concentrate on Web site features that would enhance its usability, but few of them answers why some Web design is better than others to facilitate citizens' information seeking.(Lili Wang ; Syracuse University ; Bretschneider, S. ; Gant, J. System Sciences, 2005).

The website design should be focused on specific goals, along with measurable objectives to attain them.(Written by Craig May 6th, 2014 at 4:13 pm Posted in Web Tips)

Freeman & Loo (2009) suggest there are three categories of benefits that governments can achieve from developing Web services: efficiency, user convenience and citizen involvement. Cresswell (as cited by Freeman & Loo, 2009) explains efficiency is gained by obtaining increased output with lower resources. User convenience is defined as being able to enjoy 24x7 access and saving travel costs. Finally, citizens can use e-government sites to provide greater participation in the

democratic process of government.

The benefits of on-line government services can be especially helpful to those people with disabilities. Sites have the potential to improve the quality of life for people with disabilities by providing more political participation and making government information more available (Rubaii-Barrett & Wise, 2008).

2.6 Tasks Of E-government and Web Sites :

In chapter one Been clarified the e-government from several aspects , now will go to know more about the e-government and websites .

2.6.1- E-Government Tasks :

In our research for this publication, we have carefully scrutinized the fundamental objectives and optimal goals being set for e-government practices. Based on the EU definition for the main task for e-government, mentioned in an earlier section, Fig. 1 depicts our concept of ICT for e-government objectives. The ICT utilization comes as follows.

ICT $\hat{=}$ Efficient Services $\hat{=}$ Citizen Satisfaction
--

The way that e-government may be implemented has been described in various ways. One approach is that of the(European Union) which has characterized four main tasks:

1. development of Internet-based services to improve access to public information and services

2. improvement of transparency of public administration by using the Internet;
3. full exploitation of information technology within public administration;
4. establishing e-procurement (Strejcek & Theilb, 2003) .

The implementation of E-government involves several stages and phases. E-government has various stages each one of them reflects the degree of technical sophistication and interaction with users:

- (1) simple information dissemination (one-way communication);
- (2) two-way communication (request and response);
- (3) service and financial transactions;
- (4) integration (horizontal and vertical integration); and
- (5) political participation

The research focuses on the first three stages through them, the e-government websites can provide to the users (information, e-services):

- 1- simple information dissemination (one-way communication): is the most basic form of e-government and uses IT for disseminating information, simply by posting information or data on the Web sites for constituents to view.
- 2- two-way communication (request and response): In this stage, the government incorporates email systems as well as information and data-transfer technologies into its Web sites.
- 3- service and financial transactions: the government allows online service and financial transactions by completely replacing public servants with “web-based self-services.(Hiller and Bélanger 2001).

2.7 e-Government and ICT Adoption

e-government can be described as utilizing solutions made available by advances in ICT to respond to users and citizens needs and expectations through offering efficient services. The efficiency of the services can be described in many aspects such as speed, simplicity, and transparency, to mention some.

Fig. 1 depicts utilization of ICT to serve e-government tasks and objectives.

Outcomes
Outputs
Applying ICT for
Government Services
ICT
Solutions

Efficient Services

Citizen
Satisfaction

Fig. Utilization of ICT for e-Government.

Chapter 3

Towards and effective e-government Framework

3.1. Website tasks:

Websites represents the most common and popular way for users to access information on the Internet. In the era, governments at national, regional and local levels are required to use their websites to provide citizens with access channels to data, information and services, and further offer more opportunities to engage the public participation in decision- making processes and evaluation, and furthermore maintain transparency.

Governments at national, regional and local levels have pursued opportunities to engage the public through Websites by provision of access to publications and data, participation in decision-making processes, and through interactive services.

On-line interactive services may include such facilities as petitioning, rate paying, licensing or information queries. There continues to be a diversity of implementation quality and levels for such services.

There are many functions of Government Web sites some of them :facilitate government's linkages with citizens (for both services and political activities),serve as both a communication and a public relations tool for the general public,Information and data can easily be shared with and transferred to external stakeholders.

E-Services in the public sector, in their primitive as well as sophisticated forms, should address the following tasks[7]:

- 1- Improve access to public information
- 2- Improve access to public services
- 3- Improve transparency
- 4- Involve citizens in government plans and decision making

In comparable fashion the United Nations has also articulated similar but distinct areas: internal processes such as record keeping; electronic

service delivery; virtual communities for digital democracy; and e-business opportunities. The UN has also produced participation and readiness indexes as indicators of the extent of progress and participation in e-government (United Nations Department of Economic and Social Affairs, 2004). These indexes are among a number approaches to measuring e-government performance.

Janssen et al (2004) have compared methods for assessing implementation. They used the term 'supply oriented e Government measurements' for evaluations that focus on delivery, typically through the Internet. This is closest to the second of the four UN areas, and is the focus of the following analysis which reviews approaches to Website evaluation and details an example of one instrument which is presently itself being tested for undertaking the evaluation process

3. 2 A Model for Websites Tasks in Public Sector:

A web site is the window for the most utilized Internet Services; the World Wide Web. Within the scope of focus of our paper, web sites are expected to function in order to directly accomplish the above-mentioned e-government tasks. To create and own a web site has become economically and technologically available and affordable to almost all individuals, small businesses and agencies. Public sectors at all levels--local, regional and federal—now need to create and operate web sites to directly address the e-government tasks.

In order to make the public sector web sites play their role, we propose the following three distinct tasks for a web site:

1. Provide Information about services given by this organization or agency (to be called Information Task)
2. Provide an interactive window for receiving a public service (to be called hereafter e-Service Task)
3. Provide information about the organization , mission, mandate, or authority (to be called Organization Task)

Here after we refer to those three tasks as the IEO Tasks.

At all levels of the public sector, even in developing countries with limited budgets and resources for developing sophisticated e-government systems services, designing and maintaining web sites based on the IEO tasks as a model, enables them to respond directly to the e-government task imposed.

Fig. 2 shows the functional relationship between e-government tasks and web site tasks as proposed in this paper (IEO).

Access to
Information
Access to
e-Services
Transparency
Information
Task
E-Service
Task
Organization
Task
e-Government Tasks ⇒
Website Tasks ×

Fig 2: E-government Tasks EU

The above three tasks (to be called IEO tasks) the above tasks provide guidelines for designing effective and efficient websites which through it can assessment the websites via e-government perspective . Any websites provided by national or local government should contains : Information provision, e-Services Provision and Organization Mission

3.3 Description of IEO Model :

3.3. 1 Information Provision:

The task of e-government websites information provision mean the website content (any information related to (services, public,statistical)) this is the role number one of proposal model

This is the most basic form of e-government. In this stage, governments typically post simple and limited information through their web sites, such as the office hours, contact information, and official

documents. At first, most of the information is static. However, with the advancement of e-government capability, the information posted can be more dynamic, specialized, and regularly updated.

3.3.2 e-Services Provision:

The second role of e-government website of proposal model (provide e-services), started by provides interaction between the governments and the users (including both individual citizens and business). and enables users to conduct complete on-line transactions. Citizens can conduct self-services online such as license applications, tax filing, and personal information updates. In addition, businesses can access on-line services such as fulfilling tax forms, applying

3.3.3 Organization Information Provision :

The third role of e-government proposal model (any information related to authority) which benefit the user and orient the citizens with role and services given by this the organization. This task also includes the structure of the organization. This tasks contributes to the trust of citizens for the organization.

Chapter Four

IEO Tasks-based Evaluation of Public Sector Websites

4.1 Implementation phase of (IEO) Frame Work Tasks:

In this chapter , we define some criteria and approaches to implement and evaluate web sites within the context of e- government, using our proposed approach; the IEO Tasks model.

Since IEO Tasks are related to the functionality of the web site, functionality criteria are considered to be appropriate in guiding the design and implementation of web sites, as well as in making evaluation and comparison of government web sites.

In literature review, there are several criteria proposed and used in web site evaluation [7], [8], [9]. We find that the evaluation instrument, External Evaluation System(EES), proposed by A. Golubeva et al. [10], is a good option.

EES uses four criteria in evaluation of a web site's functionality :

1. Audience orientation (with 7 items to evaluate)
2. Coverage (7 items to evaluate)
3. Information Currency and Accuracy (5 items)
4. Interactivity(4 items)
- 5.

The optional items or features provided by the EES for each of the criteria above, and those used in our evaluation application appear in the next section.

4.2 Case Study: Evaluating Web Sites Using the IEO Tasks Model

In order to demonstrate the application of the IEO Tasks Model suggested in this paper, we have conducted an evaluation for two public sector sites in Sudan, namely, Ministry of Interior and the Federal Ministry of Health.

The EES evaluation method mentioned in section 1 above. Note that only the criteria for evaluation of functionality of a web site were used. For each one each one of the four criterion above, several items or options are featured.

Table 1 shows listing the items used in our evaluation.

(Irina Merkuryeva¹, Anastasia Golubeva², Nikita Shulakov³)

Table2: External Evaluation System: Features, Criteria and Evaluated Options

Features	Criteria	Evaluated options	Total
Functionality	1. Audience orientation	1-Contact information, 2-physical location, 3-key persons, 4-departments directory, 5-visiting rules and hours, 6 -agency description (history, functions, organization structure), 7-statement of purpose (mission, goals, target audience)	7
	2. Coverage	1-Description of services, 2-quality of databases (publications, legislature,statistics), 3 down-loadable documents, 4-news 5-reports on current activity, 6-comments from officials, 7- phone directories 8-billboards	7
	3. Information currency and accuracy	1-Timeliness of information updates and reviews, 2-relevancy and consistency of content, 3-assigned responsibility for pages, 4-absence of grammar and spelling errors, 5-number of pages under constructions	5
	4. Interactivity	1-Perform and subscription service,	

		2-intensity of interactive functions employment (inquiries to policy makers, discussion forums, message boards,conferences), 3-live effects, 4-completeness of transactions (bills payments, service orders, tenders participation, forms and reports submissions, products purchases)	4
--	--	--	---

Table3: details the way of Evaluations according to (IEO Tasks)

Functionality of website	I	E	O
Audience orientation	1-Contact information 2- key persons	No value	1-physical location, 2- departments directory 3- visiting rules and hours 4- agency description 5- statement of purpose
Coverage	1-quality of databases (publications, legislature,statistics) 2-down-loadable documents, 3-news 4- reports on current activity 5-phone directories	1- Description of services	1- comments from officials
Currency and accuracy	1-Timeliness of information updates and reviews,	No value	1-relevancy and consistency of content, 2- assigned responsibility for pages 3- absence of grammar and spelling errors 4-number of pages under constructions

Interactivity	No value	1- Perform and subscription service 2- intensity of interactive functions employment (inquiries to policy makers, discussion forums, message boards, conferences), 3- live effects 4-completeness of transactions (bills payments, service orders, tenders participation, forms & reports products purchases)	No value
Total score	8	5	10

Table(4): IEO tasks guidelines option value (functionality features)

IEO Tasks	Functionality options value	Functional criteria
Information Provision	1-Contact information 2- key persons 3-quality of databases (publications,legislature,statistics) 4-down-loadable documents, 5-news 6- reports on current activity 7-phone directories 8-Timeliness of information updates and reviews, 9-visiting rules and hours 10- Description of services	Audience orientation Audience orientation Coverage Coverage Coverage Coverage Coverage accuracy and currency Audience orientation Coverage
E-services Provision	1- Perform and subscription service 2- intensity of interactive functions employment (inquiries to policy	Interactivity Interactivity

	makers, discussion forums, message boards, conferences), 3- live effects 4-completeness of transactions (bills payments, service orders, tenders participation, forms and reports submissions, products purchases)	Interactivity Interactivity
Organization information Provision	1-physical location, 2- departments directory 3- agency description 4- statement of purpose 5-comments from officials 6- relevancy and consistency of content, 7- assigned responsibility for pages 8- absence of grammar and spelling errors 9-number of pages under constructions	Audience orientation Audience orientation Audience orientation Audience orientation Coverage accuracy and currency accuracy and currency accuracy and currency accuracy and currency accuracy and currency

In order to demonstrate the application of the IEO Tasks Model suggested in this paper, we have conducted an evaluation for *three* public sector sites in Sudan, namely, Ministry of Interior, the Federal Ministry of Health, and Ministry of High education. In addition, websites of High Education in two other countries, namely United Arab Emirates(UAE) and Kenya, are evaluated.

The EES evaluation method mentioned in section A above was used in our experiment to demonstrate application of the IEO Tasks Model, and a way to carry out the evaluation.

Note that only the criteria for evaluation of functionality of a web site were used. For each one of the four criterion above, several items or options are considered. Table I shows listing the items used in our evaluation.

In the evaluation process, we assign a "1", when an item for a specific criteria exists on the web site. Otherwise, we just assigned "0". For sake of simplicity, we have not weighted the quality or volume of information related to each item. A total of 24 items are searched for on each site, for the *IEO* tasks.

In our evaluation approach, we have distributed the 24 items for the functionality criteria (Table I) among the *IEO Tasks*. A statistical summary is shown in Table II. This approach is used as a guideline for how evaluate websites in public sector based on *IEO Tasks*.

TABLE 2-2 CRITERIA AND EVALUATION ITEMS PER *IEO*-TASKS

Criteria	Evaluation items per Tasks		
	<i>I</i> -Task	<i>E</i> -Task	<i>O</i> -Task
1. Audience orientation	3	0	4
2. Coverage	7	0	1
3. Currency/Accuracy	1	0	4
4. Interactivity	0	4	0
Total	11	4	9

4.2.1 Case Study From Sudan:

We have evaluated three websites in Sudan. Table 5 shows types of items found related to each of the *IEO Tasks* in the first site; Ministry of Interior .

Table (5): Websites evaluating according to (*IEO*) Tasks: Ministry of

Interior, Sudan

Websites from Sudan	Information Provision	E-Services Provision	Organization Mission
Ministry of Interior	<u>1-Timeliness news</u> <u>2-,search engine</u> <u>3-Contact information</u> <u>4-personal id</u> <u>5-database (public,legislation)</u> <u>6-reports on current</u> <u>7-phone directory of services</u> <u>8- phone directory of services</u> <u>9-download able document</u>	<u>1- live effect</u> <u>2-download able form</u> <u>3-Description of services,</u>	<u>1 -departments directory,</u> <u>2-agency description</u> <u>3- mission, goals, target audience</u> <u>4- physical locations</u> <u>5-11pages under constructions</u> <u>6-assigned responsibility for pages</u> <u>7- absence of grammar and spelling errors</u>

Table 6 shows types of items found related to each of the IEO Tasks in the first site; Ministry of Health .

Table (6) : Websites evaluating according to (IEO) Tasks

Websites from Sudan	Information Provision	E-Services Provision	Organization Mission
Federal Ministry of Health	<u>1-Contact information</u> <u>2-Timeliness news</u> <u>3-personal id</u> <u>4-database (statistic,public)</u> <u>5-reports on current</u> <u>6- Timeliness of information updates</u> <u>7- download able document</u>	<u>1-subscription services</u> <u>2-download able form</u> <u>3-Description of services,</u>	<u>1-departments directory</u> <u>2-statement of purpose (mission, goals, target audience)</u> <u>3-agency description</u> <u>4-assigned responsibility for pages,</u> <u>6-visiting rules and hours</u> <u>8- relevancy and consistency of content</u> <u>9--physical locations</u>

			<u>10-comment from official</u> <u>11-number of pages under constructions</u>
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Table 7 shows types of items found related to each of the IEO Tasks in the first site; Ministry of High Education .

Table (7): Websites evaluating according to (IEO) Tasks: Ministry of High Education

Websites from Sudan	Information Provision	E-Services Provision	Organization Mission
Ministry of High Education	<u>1-Contact information</u> <u>2-not update report</u> <u>3-phone directories</u> <u>4-data- (public,statistical,legislation)</u> <u>5-timeliness of information</u> <u>6 key persons</u> <u>7- news</u> <u>8-search engine</u>	<u>1-down-loadable form</u> <u>2-completeness transactions(bills order) service n</u> <u>4-intensity of interactive functions employment (inquiries to policy makers</u> <u>5- live effect</u> <u>6-Description of services,</u>	<u>1- departments directory</u> <u>2- visiting rules and hours</u> <u>3- agency description</u> <u>4- statement of purpose</u> <u>5-comments from officials</u> <u>6- relevancy and consistency of content,</u> <u>7- assigned responsibility for pages</u> <u>8- absence of grammar and spelling errors</u> <u>9-number of pages under constructions</u>

Tables 8 shows a summary for the sites in Sudan.

Table(8): IEO Tasks evaluation in Sudan

Websites from Sudan		Ministry of Interior			Minister of Health			Minister of Hight Education		
Functionality criteria	total	I	E	O	I	E	O	I	E	O
Audience orientation	7	2	0	5	3	0	4	2	0	4

Coverage	7	4	1	1	4	1	1	5	1	1
Currency and accuracy	5	2	0	3	1	0	3	1	0	3
Interactivity	4	0	1	0	0	1	0	0	3	0
Total score	23	8	3	9	8	2	9	8	4	9

4.2.2 Case Study2: UAE& Saudi Arabia

For sake of comparison, the IEO Approach is also applied to e-government in UAE and Saudi Arabia. Table 9& 10 below show detail of tasks items for each site.

Table:(9): UAE

Websites from (UAE)	Information Provision	E-Services Provision	Organization Mission
Ministry of High Education (UAE)	<u>1-Contact information</u> <u>2- key persons</u> <u>3-quality of databases (publications,legislature,statistics)</u> <u>4-down-loadable documents,</u> <u>5-news</u> <u>6- reports on current activity</u> <u>7-phone directories</u> <u>8-Timeliness of information updates and reviews,</u>	<u>1-down-loadable form</u> <u>2-completeness transactions(bill payments,service order)</u> <u>service n</u> <u>3-intensity of interactive functions</u> <u>employment (inquiries to policy makers</u> <u>4 live effect</u> <u>5-Description of services,</u>	<u>1- departments directory</u> <u>2- visiting rules and hours</u> <u>3- agency description of purpose</u> <u>5-comments from officials</u> <u>6- relevancy of and consistency of content,</u> <u>7- assigned responsibility for pages</u> <u>8- absence of grammar and spelling errors</u> <u>9-number of pages under constructions</u>

Table:(10): Saudi Arabia

Websites from Saudi Arabia	Information Provision	E-Services Provision	Organization Mission
Federal Ministry of Health Saudi Arabia	<u>1-Contact information</u> <u>2- key persons</u> <u>3-quality of databases (publications,legislature,statistics)</u> <u>4-down-loadable documents,</u> <u>5-news</u> <u>6- reports on current activity</u> <u>7-phone directories</u> <u>8-Timeliness of information updates and reviews,</u>	<u>1-down-loadable form</u> <u>2-completeness transactions(bill payments,service order)</u> <u>service n</u> <u>3-intensity of</u> <u>interactive</u> <u>functions</u> <u>employment (inquiries to</u> <u>policy makers</u> <u>4 live effect</u> <u>5-Description of services,</u>	<u>1- departments directory</u> <u>2- visiting rules and hours</u> <u>3- agency description</u> <u>4- statement of purpose</u> <u>5-comments from officials</u> <u>6- relevancy and consistency of content,</u> <u>7- assigned responsibility for pages</u> <u>8- absence of grammar and spelling errors</u> <u>9-number of pages under constructions</u>

Table below shows the results of scores of two sites in UAE and Saudi Arabia.

Table(11): Comparison of two different sites: UAE/Saudi Arabia

Websites from Arab Country		Ministry of High Education (UAE)			Federal Ministry of Health Saudi Arabia		
Criteria	total	I	E	O	I	E	O

Audience orientation	7	2	0	4	2	0	4
Coverage	7	5	1	1	5	1	1
Currency and accuracy	5	1	0	3	1	0	3
Interactivity	4	0	4	0	0	4	0
Total score	23	8	5	8	7	5	8

4.2.3 Case Study From Kenya:

Table 12 below show detail of tasks items for Ministry of Education in Kenya site.

Table(12): Kenya

Websites from Kenya	Information Provision	E-Services Provision	Organization Mission
MINISTRY OF EDUCATION , SCIENCE AND TECHNOLOGY	<u>1-Contact information</u> <u>2- key persons</u> <u>3-quality of databases (publications,legislature,statistics)</u> <u>4-down-loadable documents,</u> <u>5-news</u> <u>6- reports on current activity</u> <u>7-phone directories</u> <u>8-Timeliness of information updates and reviews,</u>	<u>1-down-loadable form</u> <u>2-completeness transactions(bill payments, services order)</u> <u>service n</u> <u>3-intensity of interactive functions</u> <u>employment (inquiries to policy makers</u> <u>4 live effect</u> <u>5-Description of services,</u>	<u>1- departments directory</u> <u>2- visiting rules and hours</u> <u>3- agency description</u> <u>4- statement of purpose</u> <u>5-comments from officials</u> <u>6- relevancy and consistency of content,</u> <u>7- assigned responsibility for pages</u> <u>8- absence of grammar and spelling</u>

			<u>errors</u> <u>9-physical</u> <u>location</u>
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5. 1 Results Summary:

Table 13 shows evaluation results for two web sites in Sudan. Features or items related to each of the IEO tasks (Information, E-Service, Organization) are assessed and summed up separately for each site.

TABLE 13 RESULTS1: SCORES FOR TWO SITES FROM SUDAN

Comparing 2 sites in Sudan for IEO-Tasks									
Criteria	Total	Site1-Sudan ^a			Site2-Sudan ^b				
		I	E	O	I	E	O		
1. Audience orientation	7	3	0	4	3	0	3		
2. Coverage	7	5	0	1	5	0	1		
3. Currency/Accuracy	5	2	0	3	1	0	3		
4. Interactivity	4	0	1	0	0	1	0		
Total Score		10	1	8	8	1	7		
Total Score for IEO	23	19			16				

a. Site1-Sudan: Ministry of Interior: <http://sudanpolice.gov.sd/>, as of Oct 2014

b. Site2-Sudan: Ministry of Health: <http://www.fmoh.gov.sd/indexAr.php>, as of Oct 2014:

Table 14 shows evaluation to three websites for similar public sector, in three countries, namely Sudan, UAE, and Kenya.

TABLE 14 EVALUATION RESULTS2: SCORES FOR THREE SITES FROM SUDAN, KENYA AND UAE

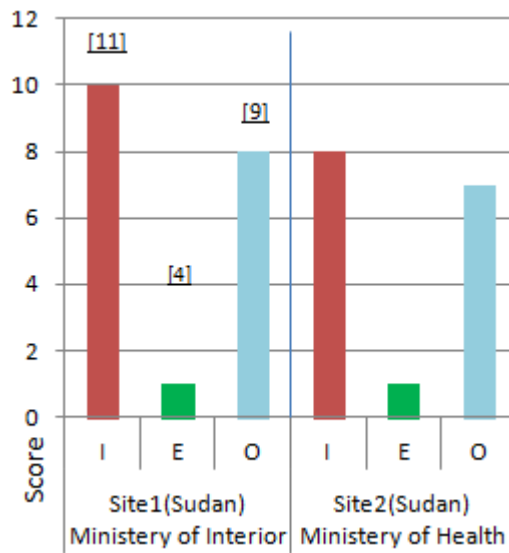
Comparing Relevant sites in 3 Countries										
Criteria	Total	Site3-Sudan ^c			Site4-UAE ^d			Site5-Kenya ^e		
		I	E	O	I	E	O	I	E	O
1.	7	3	0	3	3	0	3	3	0	3
2.	8	6	0	1	6	0	1	6	0	1
3.	5	1	0	3	1	0	3	1	0	3
4.	4	0	3	0	0	4	0	0	1	0
Total Score		10	3	7	10	4	7	10	1	7

Comparing Relevant sites in 3 Countries										
Criteria	Total	Site3-Sudan ^c			Site4-UAE ^d			Site5-Kenya ^e		
		I	E	O	I	E	O	I	E	O
1.	7	3	0	3	3	0	3	3	0	3
Per website		0			0			0		
		20			21			18		

- ^{c.} Site3-Sudan: Ministry Of High Education: <http://www.mohe.gov.sd/>,
- ^{d.} Site4-UAE: Ministry of High Education: <http://www.mohe.gov.ae/>;
- ^{e.} Site5-Kenya: Ministry of Education: <http://www.education.go.ke/home/>, All sites are evaluated as of Oct 2014

5.2 Results Discussion

Fig. 3 shows a graph presenting the results of the evaluation of the two web sites (data in TableIV) using the IEO Tasks model.

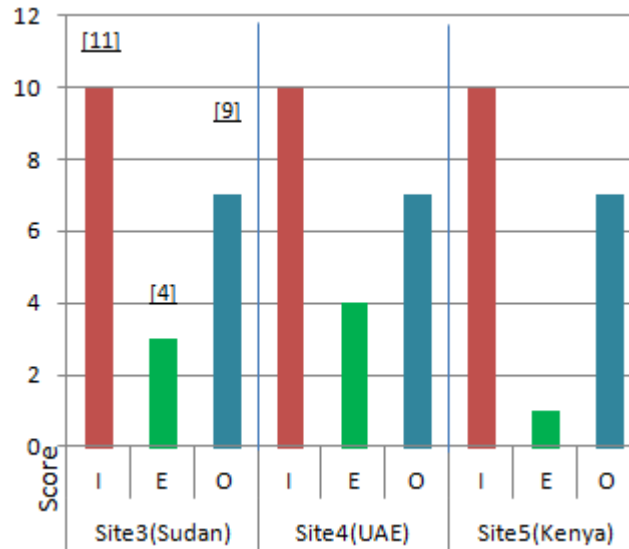


Scores of IEO Tasks for two Government Websites, Sudan

Graph of Fig.3 tells that *site 1* scored slightly better for both *I* and *O* tasks, with total of 19 (out of 24 values). *Site 2* had a total of 16 values available. Telling about the functionality of the two sites, a rather good score with regard to accomplishment of the *I* and *O* tasks that to be address by public sector web site. However, both sites performed poor with regard to *E* tasks that related to the interactivity or e-*Services*.

Note that the less score at the *E*-task (or e-*Service* Task), comes as no surprise, considering the level of sophistication needed for e-*services* and ICT infrastructure in developing countries. So, with about 67% or more achievement, IEO-tasks are addressed rather well.

Fig. 4 shows a graph of the data in Table V, for High Education Websites (Sudan, UAE, Kenya).



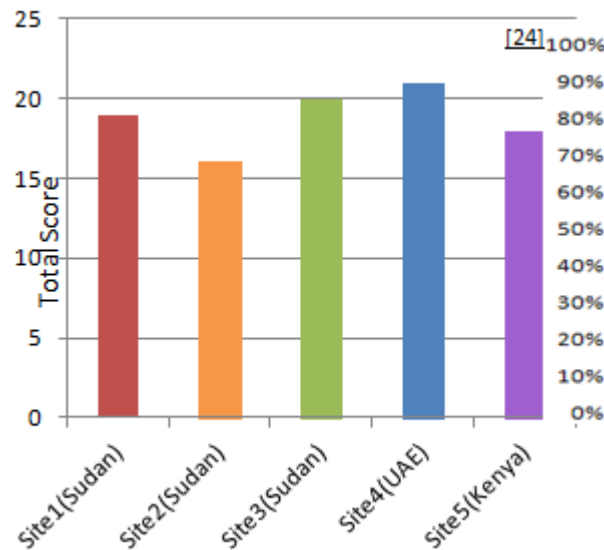
IEO Tasks of Websites (Ministry Of High Education) in Sudan, UAE, Kenya

From the above graph, the three sites items and features related IEO-Tasks are mostly existing. All of the three sites contained all of the I-task 8 items. Site4 of UAE had standard e-Service format. However, all of the three sites missed some items in the O-Task. The O-Task (Organization) is expected to provide transparency, attract more trust from the users, and is concerned with providing information on the mission of the organization, legislation available for the organization's authority, its organizational and administrative structures. Meanwhile, the former, I-Task (Information) is concerned with giving information about existing services (typically off-line), and other information that citizens or users may need or want to know, or would enhance their readiness to receive or to apply for government services.

Fig5. shows the total evaluation score for each of the five web sites examined in this paper research. All of the five web sites are considered fairly good sites in addressing e-government objectives based on the IEO Tasks, and evaluation criteria used. Scores ranged between 67% ~ 88%.

5. 3 CONCLUSION

In this paper, within a framework of efficient e-government, we have discussed the role of web sites and defined three tasks for public sector web sites, are closely related to the e-government ultimate objectives. Those three tasks are named in this paper the *IEO tasks*. They refer to the Provision of Information about the authority services (I), Provision of Electronic services (E), and Presentation of the Organization (O) to users. The IEO Tasks are defined and meant to serve the core tasks described for e-government implementation.



Overall Evaluation IEO Tasks of Websites (Ministry Of High Education) in Sudan, UAE, Kenya

The core government tasks described in this paper include serving citizens by provision of information, access to e-services and transparency. In contrast to main stream of conventional approaches of addressing and evaluating web sites as a whole or in general, we proposed the *IEO Tasks* approach, where those three distinct tasks reflect the prime objective of the web site in accordance with the principal tasks of e-government.

The way IEO Tasks can be investigated, have been demonstrated using web site functionality evaluation criteria. Fix government web sites in Sudan, UAE, Kenya have been evaluated according to the proposed IEO Task Model, and using guidelines that enabled easy and objective evaluation of various websites in different styles. The results showed an objective and discrete assessment for each site, and a comparative assessment of the sites was presented.

The IEO tasks Model presents a clear instrument and guideline for

designing, building and evaluating web sites. Building web sites nowadays has become affordable, and those guidelines will enable particularly local and federal governments in developing countries to create efficient and functional web sites even with limited resources. The result is expected to be providing efficient websites that serve the optimal goals of utilizing ICT solutions to deliver government services, enhance transparency, and gain citizen satisfaction and trust.

Another advantage for the IEO tasks model is that it provides an instrument or a tool to evaluate properly the objectivity of the primitive web site as well as sophisticated portals, each on its context of functionality. This is particular important for departments at early stages of e-government services implementation.

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