

## USABILITY PRINCIPLES MAKE IRAQI E-GOVERNMENT PORTAL MORE ACCESSIBLE

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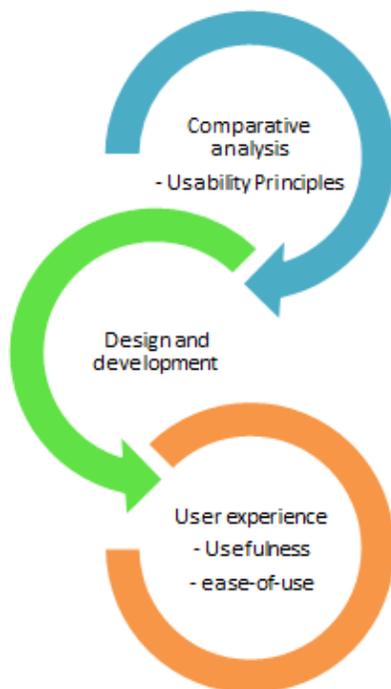
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### Graphical abstract



### Abstract

This paper reports on an initiative that redesigns the Iraqi portal. The new set of features were determined by comparatively study the famous highly-accessed portals. Additionally, the features were determined based on usability principles. Based on the gathered features, the portal, which is named Iraqi e-government portal (le-gP) was designed and developed. Then, users were let to experience the portal and their feedback were gathered through an adapted instrument. The results reveal that the le-gP is perceived useful and easy to use. This further leads to a high access to the le-gP.

*Keywords:* Usability, accessibility, e-government, portal, interface

### Abstrak

Kertas kerja ini melaporkan satu inisiatif yang mereka bentuk semula portal Iraq. Satu set ciri-ciri baru telah dikenalpasti melalui kajian perbandingan terhadap portal yang popular dan mempunyai rekod capaian yang tinggi. Sebagai tambahan, set ciri-ciri tersebut ditentukan berasas kepada prinsip-prinsip kebolegunaan. Berdasar kepada set ciri-ciri yang telah diperolehi tersebut, portal yang dinamakan Iraqi e-government portal (le-gP) direka bentuk dan dibangunkan. Setelah itu, para pengguna diberi peluang menggunakannya dan maklumbalas daripada mereka dikumpul melalui satu alatan yang diadaptasi dari kajian-kajian lepas. Hasil penilaian menunjukkan bahawa le-gP dianggap berguna dan mudah digunakan. Seterusnya, ia mempertingkatkan capaian ke le-gP.

*Kata kunci:* kebolegunaan, capaian, e-kerajaan, portal, antara muka

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## 1.0 INTRODUCTION

Technically, a portal stands on back office infrastructure, helped by its front office de-sign. Both parts should complement each other in ensuring that all functions work well and users fell happy to use. With regards to that, this study focuses on the front office of Iraq e-government portal. Iraq has shown a considerable increase in Internet connections from 12,500 in 2000 to 2,750,000 in 2008 [1]. In response to that, it is believed that developing e-government

portal that addresses accessibility issues is a key to grow the utilization of ICT [2-3]. It further leads to the adoption and appropriation amongst the masses [4].

## 2.0 PRELIMINARY STUDY

This study conducted a preliminary survey in 2014 to understand the real problem regarding the access to Iraqi e-government portal. In the study, a survey that contains questions in Table 1 asking about the current

portal of Iraqi e-government was addressed to Iraqi people in Malaysia. Altogether, 30 participations involved in the preliminary study. They work online for

tasks related to passport, election, and others, with age between 20 and 50 years old. Additionally, their expertise varies.

**Table 1** Questions asked in the preliminary survey

No.	Questions
Q1	I am using the services for e-government in Iraq.
Q2	I use the e-government services through the portal.
Q3	I am satisfied with the services in the Iraqi e-government portal.
Q4	The interface for Iraqi e-government portal is easy to use.
Q5	It is easy to access the e-services in Iraqi e-government Portal
Q6	I think the interface of the portal needs to be redesigned
Q7	It is very hard to access the e-services in Iraqi e-government portal.

## 2.1 Result of the Preliminary Study

Referring to Table 1, together with the results in Figure 1 (particularly for Q1, Q2, Q4, and Q5), it could be understood that the access of Iraqi e-government portal is low, agreeing with [1, 5]. It should not happen because the access to the Internet in Iraq is high [6]. In this case, improper links refers to going directly to the e-services without getting into them through the main portal. This is worrying because they could bypass the security feature. More importantly, the users miss much in-formation provided in the main portal. E-Government portal have to be secure at various levels or stages in the e-government [6] as well as a successful e-government structure should be completely able to do everything they want to do with their government through one e-government portal [9].

This explains that the front part of the portal, which connects the users with the portal, is not helping the users to perform their tasks [7]. Hence, although the functions are working well, the interaction styles must be well-designed too [8]. In short, quality measurement for e-government portal is very important for the improvement of user satisfaction from web portals [11, 14].

Also, to increase the access, the interface of the portal needs to be re-designed so that it is easier and more intuitive. The portal should enable the users to select, analyze, interact, and download materials at any time. Also it should be in trilingual (Arabic, Kurdish, and English) so that it is usable by all interested parties [3, 6]. This is deduced through the answer of Q6 – “I think the interface of portal need to

redesign”. The functions in a portal are designed to search, classify the data at three levels of complexity: (1) information publishing and linking of existing web sites, (2) single agency transactions, and (3) transactions requiring integration of multiple agencies [13]. Such guideline should be mapped in the Iraqi governance so that the portal could have better quality, more accessible and useful [8], especially, because the current portal of Iraqi e-government is not secured, not easy for use and it needs to be enhanced [2, 15]. Besides that, Figure 1 explains that the rate of citizen who use e-government services directly and the rate of use of the e-services through the portal are very small.

Shortly, the preliminary study reveals that the user interface of the front office of the Iraqi e-government portal needs to be redesigned to support user tasks. This study believes that the unfriendly user interface leads to the low access of the Iraqi e-government portal. This is because they are not satisfied with the user interface. Hence, this study takes the initiative, to re-engineer the requirement for the user interface of the Iraqi e-government portal.

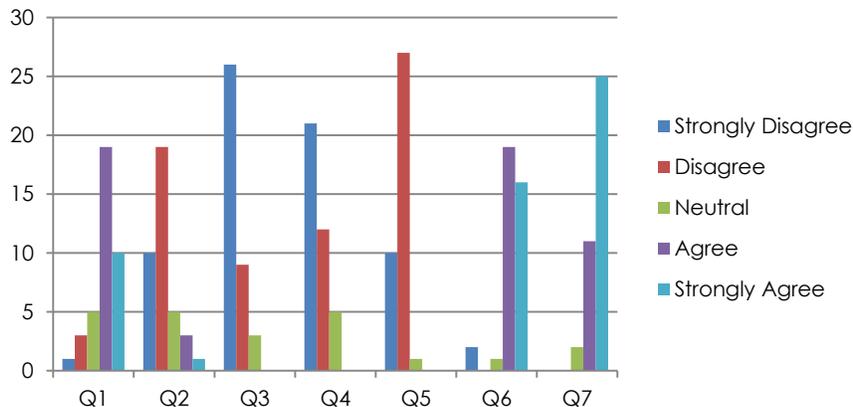


Figure 1 Results of preliminary study

### 3.0 DEVELOPMENT

Based on the findings of the preliminary survey, this study designed and developed an alternative prototype of the portal, which is called Iraqi e-government Portal (Ie-gP). This study uses use case diagram (Figure 2) to represent the functional modules. The class diagram (Figure 3) is used to depict all the objects in the portal, while sequence diagram (sampled in Figure 4) is used to demonstrate the interaction between objects in the portal. After the Ie-gP has been developed, with some additional features and upgraded existing features as detailed in Table 2, it was up to the server and made online, and users were encouraged to experience it. After a month, the users were asked on their perception on the Ie-gP.

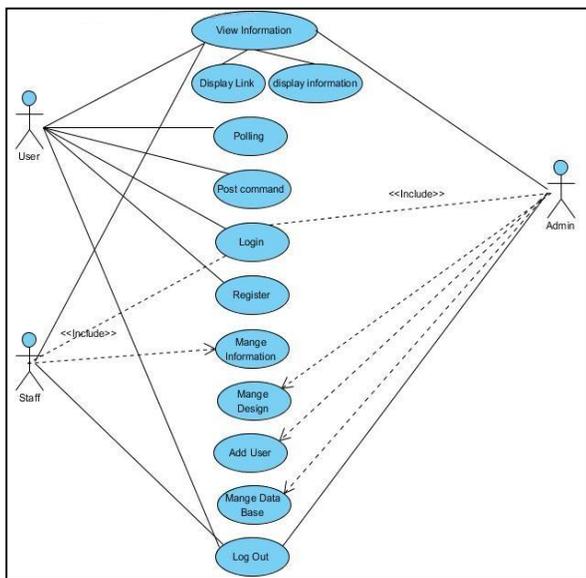


Figure 2 Use Case Diagram

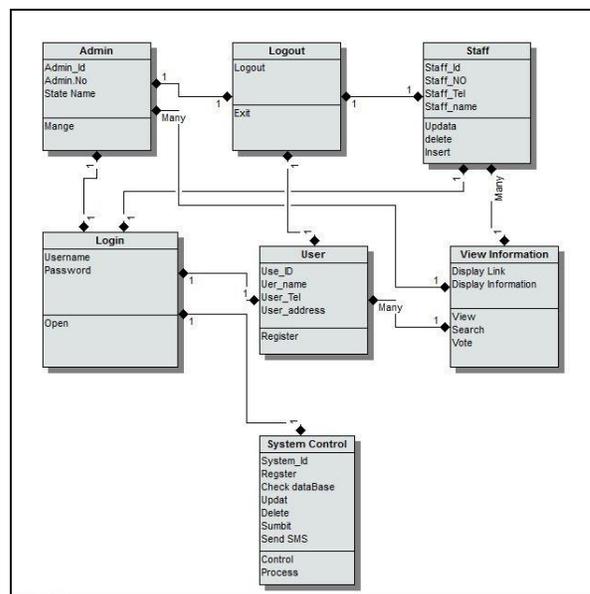


Figure 3 Class Diagram

Prior to the designing stage, the features for Ie-gP were determined through a comparative analysis involving a number of highly-accessed portals in various countries including Malaysia, Jordan, UAE, India, Punjab, and Korea [11, 12, 13]. The features in Table 2 were decided based on considerations that the Ie-gP should be usable for the intended users. Basically, people who have access to the Internet are the users of the Ie-gP, who have certain level of living standard. They have computer background, supported with sufficient educational background. Hence, the usability principles [7, 8, 13, 15] have been considered, which eventually lead to the formation of features in Table 2.

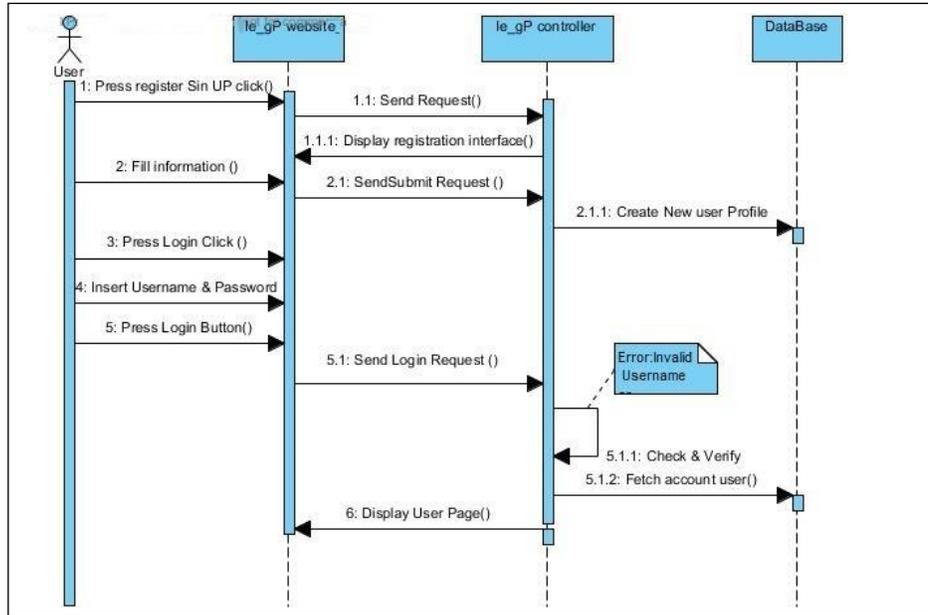
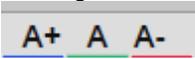
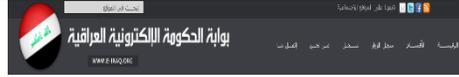


Figure 4 Interaction Diagram

Table 2 Comparison on features in le-gP and the old portal

Feature	le-gP	Old Portal
Main Page		
Address	<a href="https://www.e-iraq.org">https://www.e-iraq.org</a>	<a href="http://www.e-gov.gov.iq">http://www.e-gov.gov.iq</a>
Customer support	E-mail Phone Social Media Feed back	Supported Supported Not support Not support
Accessibility	Access to e-services by 1 step, this feature attracts users.	Access to e-services by at least 5 steps.
Change font size	Can change the font size. 	Cannot change the font size.
Change the colours	Support changing the colour. 	Does not support this feature.
Multi Language	Support three languages. 	Support two languages (only Arabic and English).

Consistency: colours and logo



Statistics

Support the statistics of e-service.

Does not support this features



Mailing list

Provides a feature for sending news.

Does not support this features

Locate users

This feature locates the users, identifying users' location, and whether users are on mobile phone or computer.

Does not support this features



Extra Link

Provides 56 links.

Provides 5 links.

Page size

983 KB

1.1 MB

Load page

0.54 seconds

5.07 second

Temperature

Notifies the temperature in various place in the world.

Does not support this features



Registration

Registers users in the portal.

Does not support this features

Username: admin  
Password: [masked]  
Login

News bar

This feature helps notifying the beark news in the portal and new e-service provided in the portal.

Does not support this features

Classification services

Services classified by ministries

Services not classified by ministries



Basically, Table 2 comprises of the usability principles employed in the le-gP. They have been incorporated into the prototype as a response to the

limitations in the existing portal. They have been tested with the real users, and the results are tabulated in the following section.

### 3.0 FINDINGS

This study measures the ease of use, and usefulness of the le-gP after testing its functionalities. The functionalities were tested first to ensure that the users express their authentic feedback on the working portal, without any bias led by the functionality error.

The perceived ease of use and usefulness were measured using the established instrument [17] with some adaptation, in which 30 respondents involved. They were students of public universities in Malaysia, who use the portal for administrative purposes. They

were forwarded with the URL of the le-gP, and let to have access at their own convenience. Having gathered the feedback, the results as exhibited in Tables 3 and 4 were discovered.

The tables explain that the users are happy with the le-gP. In detail, all users agree that the portal with the new and upgraded features based on usability guidelines is useful. Meanwhile, in terms of perceived ease of use, two users (6.67%) were not sure whether they learn quickly. Meanwhile, there was a user (3.33%) unsure whether he or she remembers how to use the portal and on the operation.

**Table 3** Results of perceived usefulness

Perceived Usefulness		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	Using le-gP would enable me to access e-services more quickly.				5	25
2	Using this le-gP could save my time and efforts.				4	26
3	Using this le-gP has the ability to give the portal features that satisfy with my requirement.				4	26
4	Using this le-gP gives me brief and simple information about what I need.				6	24

**Table 4** Results of perceived ease of use

Ease to Use		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5	It is easy to use.				7	23
6	It is flexible use.				8	22
7	It is simple to use.				4	26
8	It is user friendly.				4	26
9	It requires the fewest steps possible to accomplish what I want to do with it.				7	23
10	I can use it without written instructions.				6	24
11	I learned to use it quickly.			2	7	21
12	I easily remember how to use it.			1	9	20
13	I can use it successfully every time.				5	25
14	I always felt I know what it was possible to do next.			1	6	23
15	portal feedback: It is helpful in the error message				8	22
16	My mistakes were easy to correct.				6	24

## 4.0 DISCUSSION

The findings reveal that the new features make the le-gP usable, which further leads to high accessibility. Users are not happy with the existing portal maybe because it was developed a few years ago, while the technology was old. When compared to the current advancement, the portal is perceived not usable, because it lacks of many features. In contrast, the le-gP is developed with current technology, updated and customized with currently attractive features. Additionally, it incorporates with additional utilities, making it looks and performs timely and sophisticated. This makes users feel that they are performing at their best using the le-gP, agreeing with Al-Taie and Kadry [8].

The features were gathered from the existing portals, by comparatively studying the features in currently famous portals, which have high access. This is partly the reason that ensures the le-gP is perceived useful and easy by the users. It really helps this study determining what users prefer. It maps the general anticipations for e-government portals [12].

While this paper reports on the initial results, the pilot implementation is currently in place. It is expected that the le-gP is extended into a full implementation and more data are gathered soon to further enrich the knowledge related to the accessibility of the system. This study believes that continuous improvement ensures that the portal is always perceived relevant by the users, and hence attracts users to utilize the system, which is also recommended by Durickovic and Kovacevic [18]. Further, this improves the productivity in the context related to the portal [16, 20].

## 5.0 CONCLUSION

While the technology has grown-up tremendously, the e-government system should follow the stream to attract users for optimum utilization. In Iraq, the old portal has not been in the landscape, where users are happy. A preliminary study reveals that the access was too low, which was caused by the inability of the front-office or user interface to interest users. Hence, this study proposes a net set of features derived from a comparative study involving various famous highly-accessed portals. Having designed and developed the new portal called le-gP, user feedback was gathered. Obviously, the results reveal that the newly designed portal, with the new set of features is preferred by the users. Hence, this will increase the accessibility of the portal like that appears in Malaysia [19], Dubai [10] and Korea [11, 20].

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## References

- [1] Heshmati, A., Al-Hammadany, F. H., and Bany-Mohammed, A. 2013. Analysis of Internet Usage Intensity in Iraq: An Ordered Logit Model. *Journal of Knowledge Management, Economics and Information Technology*. 3(3).
- [2] Al Athmay. 2013. E-Governance in Arab Countries: Status and Challenges. *Global Journal of Business Research*. 7(5): 79-98.
- [3] Abdulwahid, H. S., Mutalib, A. A., Yusof, S. A. M., and Alib, S. J. 2014. Designing and Implementation Iraqi E-Government Front Office Online System. *Journal of Knowledge Management, Economics and Information Technology*. 4(1.1).
- [4] Kettani, D., and Mahdi, A. E. I. 2009. Implementing e-Government Accessible To Illiterate Citizens. In *Information and Communication Technologies and Development (ICTD), 2009 International Conference*. 486-486.
- [5] Al-Hammadany, F. H., and Heshmati, A. 2011. Determinants of Internet Use in Iraq. *International Journal of Communication*. 5(23).
- [6] Al-Taie, M. Z., and Kadry, S. 2013. E-Government: Latest Trend and Future Perspective The Iraq Case. [Online]. From: <http://www.academia.edu/3517507>. [Accessed on 27 February 2014].
- [7] Preece, J., Rogers, Y., and Sharp, H. 2007. *Interaction Design: Beyond Human-Computer Interaction*. 2nd Edition. John Wiley & Sons, Ltd. England.
- [8] Dix, A. 2009. *Human-Computer Interaction*. Springer US. 1327-1331.
- [9] Al-Zuabi, H., and Mahmud, M. 2011. Implementation of e-Government in Arab Countries: A Literature Review. In *Research and Innovation in Information Systems (ICRIIS), 2011 International Conference*. 1-5.
- [10] Dubai Portal. 2014. Dubai e-government portal. [Online]. From: <http://dubai.ae/en>. [Accessed on 27 February 2014].
- [11] Korea portal. 2014. Official Korean e-government portal. [Online]. From: <http://korea.go.kr>. [Accessed on 27 February 2014].
- [12] Punjab portal. 2014. [Online]. From: <http://www.punjab.gov.pk>. [Accessed on 27 February 2014].
- [13] Nielsen, J. 1994. Heuristic evaluation. *Usability Inspection Methods*. 17(1): 25-62.
- [14] Wickens, C. D., Gordon, S. E., and Liu, Y. 1998. *An introduction to Human Factors Engineering*. Addison-Wesley Educational Publishers Inc. USA.
- [15] Mayhew, D. J. 1999. The Usability Engineering Lifecycle. In *CHI'99 Extended Abstracts on Human Factors in Computing Systems*. 147-148.
- [16] Evans, D., and Yen, D. C. 2006. E-Government: Evolving Relationship Of Citizens And Government, Domestic, And International Development. *Government Information Quarterly*. 23(2): 207-235.
- [17] Davis, F. D. 1989. Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technology. *MIS Quarterly*. 319-340.
- [18] Durickovic, T., and Kovacevic, D. 2011. eGovernment in the Context Of Developing Countries. In *MIPRO, 2011 Proceedings of the 34th International Convention*. 1370-1375.
- [19] Haidar, G. G., and Bakar, A. Z. A. 2012. E-Government Success In Malaysia Through Government Portal And

- Website Assessment. *International Journal of Computer Science Issues (IJCSI)*. 9(5).
- [20] Lee, S., and Cho, J. E. 2007. Usability Evaluation Of Korean E-Government Portal. *In Universal Access in Human-Computer Interaction. Applications and Services*, Springer. 64-72.