

Requirements Specification for Service Transition to E-Government Services: Case Study in Vocational Schools of General Directorate of Vocational Education / Ministry of Education in Iraq

Marwah Mushtaq Talib
M.S, Computer Engineering Department,
Atilim University
Ankara, Turkey
E-mail: marwa.mushtaq@gmail.com

Atila Bostan
Department of Computer Engineering, Atilim
University
Ankara, Turkey
Atila.bostan@atilim.edu.tr

Baris Ozkan
Department of Information System Engineering, Atilim University
Ankara, Turkey
baris.ozkan@atilim.edu.tr

Özet- E-devlet terimi vatandaşlarına daha iyi hizmet sağlamak amacıyla devlet birimleri tarafından bilgi teknolojilerinin kullanımı olarak tanımlanabilir. Diğer devletler gibi Irak devleti de e-devlet hizmetlerinden faydalanmak istemektedir. Temel amacı profesyonel meslek alanlarında mezunlar vermek olan mesleki eğitim okulları, Eğitim Bakanlığına bağlı en büyük organizasyonlardan birisi olan Mesleki Eğitim Genel Müdürlüğü bünyesinde faaliyet göstermektedir. E-devlet paradigmasının faydalarına rağmen, bu yaklaşımın eğitim sektörüne nasıl uyarlanacağı konusunda net bir ön görüşü mevcut değildir. Bu çalışma hizmet katılımcıları ve kullanıcılarının ihtiyaç ve tercihlerini analiz ederek Irak meslek okullarında e-hizmetlerin geliştirilme ve yaygınlaştırılması konusunda bir yöntem sunmaktadır. Biz bu çalışmada, meslek okullarındaki hizmetler için sekiz farklı katılımcı sınıfı belirleyerek, her bir sınıf için farklı anket uygulamaları geliştirdik. Toplanan veriler üzerinde yapılan analiz çalışmasının sonuçları bu bildiriye sunulmuştur.

Anahtar Kelimeler-- E-Devler; E-Okul; Meslek Okulları

Abstract— E-government concept can be defined as the use of information technology by government agencies to deliver services to the citizens in a better way. Iraqi government like other governments tried to benefit from e-government services. Vocational schools are one of the formations affiliated to the Ministry of Education in Iraq and specifically to the General Directorate of Vocational Education which is one of the largest directorates in this

ministry, its main objective is to educate and graduate students in the professional and vocational fields. Despite the benefits of e-government paradigm, still there is no clear vision for how to adopt it in the education sector. This work presents which and how e-services should be developed and deployed in Iraqi vocational schools by analyzing the requirements and preferences of the service contributors and consumers. We have identified eight stakeholders in vocational schools and developed eight different questionnaires for each. Data were collected and analyzed and the results were reported in this paper.

Keywords—E-Government; E-Schools; Vocational Schools

INTRODUCTION

Nowadays, Information and communication technologies (ICT) are playing a major role in our daily lives [1]. Many governments are moving to use ICT to deliver their services to citizens and business. E – Government concept is considered as one of ICT applications which is adopted by the government [2]. E-government means obtaining government services throughout electronic means in order to access to government information and perform government transactions any where any time [3]. It is considered as a mean to efficiently and effectively improve the performance and the transparency of the government. Iraqi government has taken serious moves to adopt e-government project. These projects has a great importance in the elimination of administrative routine,

simplification of procedures in government transactions, as well as the elimination of long queues of citizens in government departments and reduce the corruption and extortion.

Education sector is considered one of the largest in the country; Ministry of Education is one of the vital ministries serving a large segment of the Iraqi society. Ministry of Education has 30 general directorates each one of them is responsible for delivering certain type of services. General Directorate of Vocational Education is one of the biggest directorates; its main objective is to educate and train students in craft and professional fields like electronic, mechanic, computer, agriculture, water purification, maintenance of elevators, nursing and trading. Despite the benefits of e-government paradigm, still there is no clear vision for how to adopt it in the education sector in Iraq. This research is intended to present which and how e-services should be developed and deployed in Iraqi vocational schools by analyzing the requirements and preferences of the service contributors and consumers. The contribution of this study is to propose a modular e-services development design with module prioritization and plausible transition path to e-environment for vocational schools in Iraq. Until recently, all administrative work is conducted on paper, when students want to register, get the exam number, set a transcript request ... etc. they have to come to school to do the paper work, The procedure is not different for teachers as well, when they want to request for a specific service they have to come to the school and fill related forms.

This research is intended to represent a plan for smooth and cost effective transition to e-services in Iraqi vocational schools which is one of the important components in Iraqi e-government development plan.

LITERATURE REVIEW

A. Studies and Scientific Researches in Educational Sector

Given the growing importance of using e-government, there are many attempts to adopt it, especially in the education sector. Many studies in this area address the necessary aspects for the success of this project or presenting e-government's frameworks and models. Some of these attempts are for higher education, some of which are for primary and secondary education.

A study conducted in Bangladesh to verify how e-government is applied in the education sector [4]. Both qualitative and quantitative research approach was conducted in this study. After analyzing the data, they came up with some recommendations which are: training for ICT should be arranged regularly, rural schools should be familiar with using E-governance not only using computers, there should be an IT specialist for each

institute in education sector, provide financial resources to promote the e-government project, provide electricity for the whole country, proper framework should be established to apply e-governance project and strength ICT in the education system in Bangladesh.

Another study examines the factors affecting the adoption of e-government education sites by teachers in primary and secondary schools in Greece [5]. The study implied that the government should take into consideration the needs of the user, enhance the services provided and provide adequate training to deal with e-government applications.

In China, transforming working style and improving the quality and efficiency of the work, has made universities and colleges move to the construct of e-government applications [6]. The study implied that the evaluation on educational e-government should focus on the "performance" not on the "output". To ensure having high performance, verification and evaluation methods with qualitative index must be applied. The results showed that "information infrastructure" has the heaviest weight and must be implemented at the first, while "safety" is considered as the least important item.

Mohammed M. and et al. [7] addressed the issue of the centralization of the higher education in Iraq. Each university is isolated from the others and they communicate with the Ministry of Higher Education only. To avoid this limitation, architecture presented to integrate universities' databases in one warehouse with E-government information technology in order to increase the efficiency of information sharing among university departments and with other universities.

B. E-Schools

E-School is an important type of e-government applications. It depends on information and communication technologies (ICT) to deliver services for students and teachers as well as to promote the concept of e-learning. The goals of e-schools are: to promote students' skills in ICT, enhance the abilities of teachers in the use of ICT in teaching and improve school's management [8].

Dimitrios z. and et al [9] argued that in order to develop e-school digital information management services, ICT infrastructure must be provided to ensure the high level of electronic services and easy access to the Internet. The electronic system in e-schools offers many facilities that increase the efficiency of the administrative process. Registration of students, management of grades, management of absences, and management of human resources are examples of some administrative services provided electronically. Students can also benefit from e-school facilities through access to updated information, effective communication and access to resources such as lesson information and lessons assessment.

There are many examples for the adoption of e-schools in some countries, for example, e-school in Turkey [10], Palestine [11], Qatar [12], Singapore [13] and Kuwait [14].

Although previous study pointed out how to verify e-government in education sector, up to our knowledge there is no study related to vocational schools specify the requirements from each stakeholder's prospective. Our study would represent service transition to e-government services in vocational schools.

RESEARCH METHODOLOGY

A. Target Population, Research Instrument and Sample Size

In order to specify target population, we had to determine stakeholders in vocational schools and the role of each one of them. After studying the structure of vocational schools, we came up with eight different stakeholders (Vocational Department, Principal, Administrative Assistant, Technical Assistant, Students' Affair Assistant, Teachers, Students and Students Families).

In order to collect data from respondents, eight different questionnaires were conducted and delivered to the samples of targeted population. Each contains demographic questions and survey questions; the distribution of questions is shown in Table1.

Although we prefer more than (50) samples for each stakeholder, Some samples were less than fifty because the period of data collection was on the days of the final examinations and therefore not all vocational schools were available for samples collecting. Sample size is shown in Table 1.

B. Questionnaire Validation

In order to minimize errors, several steps have been taken to assure the validity and reliability of the questionnaire, we will review them in detail as the following:

- The questionnaire was presented to three experts to ensure the correctness of the English language used in writing the questionnaire
- The questionnaire then translated to Arabic version and was subjected to 3 experts to review Arabic – English versions matching.
- Before collecting data, pilot testing was done to assure content clarity. Questionnaire was tested by delivering it for five samples from each group. According to the results of pilot testing, some necessary alterations were done to the questionnaire to make it more clearly for the respondents.

C. Research Hypotheses

Eight hypotheses were conducted to extract information from the respondents. Each hypothesis is specific for certain group of stakeholders.

1. Vocational Department Employees:
H1: Website is the most preferred technology to communicate with vocational schools.
2. Principal:
H2: How much important is having a website for school administration
3. Administrative Assistant:
H3: Employees' number affects the preference of automating official mail.
4. Technical Assistant:
H4: Students number influence the preference of automating the list of exercise materials required for practical courses
5. Students' Affair Assistant:
H5: How much important is the automation of authentication of the certificates
6. Teachers:
H6: How much important is the automation of human resources services
7. Students:
H7: Gender impacts the preference of automating students' registration.
8. Students' Families:
H8: Student Families prefer the automation of Exam Results more than the other services

D. Data Analyses and Statistical Tools

The Statistical Package for Social Sciences (SPSS) version 22 is used to analyze data and represent the results in a graphical form.

As statistical analyzing tools, Least Square Regression was used to show the strength and the significance of the relationship between two variables. Besides that, Median and Comparative % to set forth frequencies and percentage and Chi- Square to test some hypotheses as intended.

FINDINGS AND RESULTS

We have distributed 320 surveys to the participants, 50 for vocational department, 30 for the principals, 30 for Administrative Assistant, 30 for Technical Assistant, 30 for Students' Affair Assistant, 50 for teachers, 100 for students and 50 for students' families. Some of the responses were excluded because they were invalid. The number of valid responses is illustrated in Table2 and Table3.

TABLE1: Sample Size and number of demographic and survey questions

Stakeholders	Sample Size	Demographic Questions	Survey Questions
Vocational Department employee	50	4	2
Principal	30	5	5
Administrative Assistant	30	5	7
Technical Assistant	30	5	3
Students' Affair Assistant	30	5	5
Teachers	50	5	4
Students	100	3	3
Students' Families	50	1	3

Table2: Demographic information for Principal, Administrative Assistant, technical Assistant and Students' Affair Assistant

Property	Principle		Admin. Asst.		Tech. Asst.		Student Asst.		
	Count	%	Count	%	Count	%	Count	%	
Answers	27	100	28	100	26	100	27	100	
Gender	M	19	70.4	21	75	18	69.2	20	74.1
	F	8	29.6	7	25	8	30.8	7	25.9
Work Years	1-5	2	7.4	5	17.9	1	3.8	7	25.9
	6-10	6	22.2	9	32.1	8	30.8	6	22.2
	11-15	8	29.6	14	50	9	34.6	7	25.9
	>15	11	40.7	0	0	8	30.8	0	0

Table3: Demographic information for teachers, students, students' families and vocational department.

Property	Teacher		Student		Student Family		Vocation Dept.		
	Count	%	Count	%	Count	%	Count	%	
Answers	43	100	85	100	43	100	44	100	
Gender	M	26	55.3	46	54.1	-	-	8	18.2
	F	17	36.2	39	45.9	-	-	36	81.8
Work Years	1-5	6	14	-	-	-	-	5	11.4
	6-10	12	27.9	-	-	-	-	9	20.5
	11-15	9	20.9	-	-	-	-	12	27.3
	>15	16	37.2	-	-	-	-	18	40.9
Grade Level	1st	-	-	24	28.2	-	-	-	-
	2nd	-	-	28	32.9	-	-	-	-
	3rd	-	-	33	38.8	-	-	-	-
# of Students in Each Semester	5-50	24	55.8	-	-	-	-	-	-
	51-100	14	32.6	-	-	-	-	-	-
	101-150	4	9.3	-	-	-	-	-	-
	>150	1	2.3	-	-	-	-	-	-
# of Student in Family	1	-	-	-	-	33	76.7	-	-
	2	-	-	-	-	8	18.6	-	-
	3	-	-	-	-	2	4.7	-	-

Demographic information are shown in Table2 and Table3, were Table2 related to Principal, Administrative Assistant, technical Assistant and Students' Affair Assistant, while Table3 related to teachers, students, students' families and vocational department.

After analyzing the hypotheses we came up with the following results:

H1: According to Table4, significance values for the whole technologies are less than 0.05 including for the web site technology and this means website is the most preferred technology for communication. Therefore, the hypothesis is accepted.

Table4: Chi-square test results for Hypothesis H1

	Website	Email	SMS	Phone call	WhatsApp	Facebook	Twitter
Chi	8.551	30.694	27.429	40.240	71.653	55.280	62.837
df	3	4	6	7	7	6	7
Sig	0.036	0.000	0.000	0.000	0.000	0.000	0.000

H2: Table5 indicates that the significance value for importance of the web site for the school administration is less than 0.05; this means the relation of the answers is statistically significant. As a result, the hypothesis is accepted. It could be concluded that the presence of a website is important for respondents as the answers have shown

Table5: Chi-square test results for Hypothesis H2

	Hypothesis H2
Chi-Square	26.364
df	4
Sig.	0.000

H3: As table 6 clarifies, the level of significance is greater than 0.05, which means the relation is

insignificant. Therefore, the hypothesis is rejected. The results conducted in this study do not present enough evidences for the significance of the relation between employees' number and the preference to automate official mail.

Table6: Least Square Regression test results for hypothesis H3

Depend Variable	In depend Variable	Std. Error	R	Sig.
Official mail	Employees' number	0.633	0.156	0.428

H4: As clear in table 7, the level of significance is greater than 0.05 and means the relation is insignificant, thus the hypothesis is rejected. It cannot be indicated students' number has an influence on the preference of automating the list of exercise materials required for practical courses.

Table7: Least Square Regression test results for hypothesis H4

Depend Variable	In depend Variable	Std. Error	R	Sig.
exercise materials	students' number	0.576	0.217	0.288

H5: As shown in Table 8, the significance value is greater than 0.05, which means the relation of the answers is statistically insignificant. Therefore, we cannot conclude it is important to automate the authentication of certificates.

Table8: Chi-square table for Hypothesis H5

	Hypothesis H5
Chi-Square	2.444
df	4
Sig.	0.655

H6: For this hypothesis, significance value is less than 0.05, as Table 9 shows; this indicates the relation of the answers is statistically significant. Therefore, automating human resources services is considered important from teachers' prospective

Table9: Chi-square test results for Hypothesis H6

	Hypothesis H6
Chi-Square	31.535
df	4
Sig.	0.000

H7: Table 10 clarifies that the level of significance is greater than 0.05 and means the relation is insignificant; thus, hypothesis is rejected. It cannot be concluded gender impacts the preference of automating registration process for student's section.

Table10: Least Square Regression test results for hypothesis H7

Depend Variable	In depend Variable	Std. Error	R	Sig.
Automate Registration	Gender	0.819	0.076	0.488

H8: As shown in Table11, significant values for the whole technologies are more than 0.05 except for exam results, which means the answers for exam result is statistically valid. Thus, the hypothesis is accepted. Exam results is the most preferred service to be automated for students' families

Table11: Chi-square test results for Hypothesis H8

	attendance	Exam result	Leave request	Contact information
Chi-Square	8.047	14.558	8.628	0.605
df	4	4	4	4
Sig	0.090	0.006	0.459	0.963

CONCLUSION

The main concern of this study is to present a plan for smooth and cost effective transition to e-services in Iraqi vocational schools. We have developed and implemented eight different questionnaires for each stakeholder in vocational school system. Moreover, hypotheses were conducted to extract information from the respondents. After analyzing the hypotheses, the findings reported that vocational department's employees prefer website technology to communicate with vocational schools. Similarly, school administration results showed that it is important to have websites for vocational schools. The results also showed there is no relation between employees' number and automating official mail, the same thing for students' number and automating the list for exercise materials and gender with automating students' registration process. Automating human resources services is configured importance according to the participants, while automating authentication of certificates is considered not important. Finally, for students' families section, getting exam results in an automated form is the most preferred service to be automated.

For future work, more hypotheses can be conducted to extracts more information from the participants to represent modular design to create e-government services for vocational schools.

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Marwah Mushtaq Talib received the bachelor's degree in Computer Engineering and Information Technology from the University of Technology in 2007. After that, she worked as an engineer in the Ministry of Education in Iraq. Currently, she is a master student in Atılım University. Her current research focus on electronic government.



Asst.Prof.Dr. **Atila Bostan** graduated from Land Forces War College in 1986. He finished his Ms studies on computer engineering in Middle East Technical University (METU) in 1997 and his Phd studies on educational technologies in Gazi University in 2007. Following his retirement from government in 2009, he took his part as an assistant professor in Computer Engineering Department of Atılım University in 2009. He has more than 50 national/international journal and conference publications



Asst.Prof.Dr. **Barış Özkan** received the bachelor's degree in Industrial Engineering from Middle East Technical University in 2000. He finished his Ms studies on Software Management in 2005 and PhD on Information Systems in 2012 in Middle East Technical University (METU).

