مجلة

كلية التـــراث الجامعة

مجلة علمية محكمة

متعددة التخصصات نصف سنوية

العدد الثاني والثلاثون

12 كانون الثاني 2022

ISSN 2074-5621

رقم الايداع في دار الكتب والوثائق 719 لسنة 2011

مجلة كلية التراث الجامعة معترف بها من قبل وزارة التعليم العالي والبحث العلمي بكتابها المرقم (ب 3059/4) والمؤرخ في (2014/ 4/7)

Design and Evaluation of the M-Registration Prototype for An UndergraduateStudent: Technical College of Management as a Case Study.

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Abstract

The development of smartphones led to the prosperity of mobile government and has allowed public originations to provide their services online which can be accessed anytime and from anywhere. Although, there are several researchers tried to investigate and research in the field of mobile services and applications in Iraq but it is still at the infancy level. The problem of this study represented by the number of hard copies of a student guide is limited and is not available for all students, and the applicant is required to visit university for registration, despite the fear of the spread of COVID-19. Therefore, universities should exploit technology development to design electronic services systems that provide a guide for the students and will enable them to register online. This study tries to fill this gap by presenting an application that is used in one of the most important fields (electronic services). The application exploits a smartphone, and a network system (internet) which allows the applicant student to fulfill the requirement record of the college admission which is stored in a MySQL database; Lastly, the application sends the acceptance approval to the student account. As well as this study adopts the general methodology. The results showed a high importance of the web and mobile application to provide such services specially with the wide spread of Covide-19 to maintain the difficulties caused by the lockdown procedures. According to the results, the interfaces of the App facilitate the registration procedure significantly. Adopting such applications opens the gate toward more sophisticated trends that can serve students in abnormal situations and crisis.

Keywords: Mobile application, Application, Registration Application, Electronic Guide, E-services.

المستخلص:

أدى تطور الهواتف الذكية إلى ازدهار الحكومة الإلكترونية ومنح المؤسسات العامة الفرصة لتقديم خدماتها الكترونيا مما يتيح الوصول الى هذه الخدمات في أي وقت وفي أي مكان. على الرغم من محاولة العديد من الباحثين التحقيق والبحث في مجال تطبيقات وخدمات الهاتف المحمول في العراق إلا أنه لا يزال في مراحله الابتدائية. مشكلة هذه الدراسة تتمثل في ان عدد النسخ الورقية لدليل الطالب يكون محدود وغير متوافر لجميع الطلاب، كما انه يشترط على الطالب المتقدم الحضور للجامعة لإكمال عملية التسجيل على الرغم من انتشار كوفيد -19. لذا ينبغي على الجامعات استغلال التطور التكنولوجي لتصميم أنظمة لتقديم الخدمات الكترونياً. تحاول هذه الدراسة سد هذه الفجوة من خلال تقديم تطبيق يستخدم في أحد أهم المجالات (الخدمات

الإلكترونية). يستفيد التطبيق الهاتف الذكي ونظام الشبكة (الإنترنت) مما يسمح للطالب المتقدم بملء سجل المتطلبات للتقديم التي تخزن في قاعدة بيانات MySQL، وفي النهاية يرسل التطبيق نتيجة القبول إلى حساب الطالب. وكذلك اعتمدت هذه الدراسة المنهجية العامة. أظهرت النتيجة أنه ينبغي زيادة الاهتمام وتطوير مواقع الويب وتطبيقات الهاتف المحمول لتقديم الخدمات خصوصا في ظل انتشار وباء كورونا لمنع التقارب الاجتماعي. أظهرت النتائج ان إجراءات التسجيل ظهرت بطريقة سهلة وتوفر جميع المعلومات أيضًا، ومن السهل إدارتها من قبل المسؤولين.

1. INTRODUCTION

The tremendous development in the design of mobile devices has leaped in human life, becoming an important and indispensable part in different of life aspects and different ages. The emergence of smart phones led to the completion of work quickly and anywhere and anytime, and smart phones became available to all including businessmen, students, faculty managers, lawyers, doctors and others. It has become difficult to dispense with these devices and has been widespread in the world due to their portability and high performance [1]. The evolution of wireless technologies and increasing mobile phone penetration leads to growth in mobile applications [2]. At present, most students have a smart phone and half of them maybe have more than one [3]. The utilize of mobile phone among students has become common, as most students spend their time using smartphones either for entertainment, communication or learning purpose [4].

Globally, the provision of mobile government services (known as m-government) by using smart phone applications has had considerable growth [5]. Where, m-government opens up new horizons for mobile interaction and mobile working [6]. Most of governments provide public services to citizen by smartphones. The m-government gives the chance to the government to deliver the services to citizens in different areas, rural or the suffering from a shortage of internet service [7]. Most universities have employed mobile applications to provide adequate services, information, and guidance to students [4]. The need to these services increased especially in the universities during COVID-19 to achieve the social distancing.

The students registrations including the students guide are one of the important things in educational institutions because it helps the student to identify the universities and the scientific departments in college, as well identify the disciplines compatible to each section and thus facilitates the student to determine the section that he wishes to complete his study. Despite the importance of the student guide, we find that the student guide in the college is few and still in the form of hardcopies and does not cover the number of students applying to study at the college. In addition, admissions in the college are still displayed on the bulletin board and website, which made it difficult for students to know the names of those admitted to the college; Registration requires the student to be present in the college to complete the registration procedures.

During the interview with the registration staff at the researched college, it was found that the problem faced by the applicants is that they do not know the results of admissions that are announced on the college site because of the preoccupation of the applicants or inadvertently and negligence. The student is excluded and a replacement student is replaced. Indeed, a number of students were excluded for not reviewing during the specified period. In addition to the lack of sufficient copies of the student manual distributed to students. University students have need

information from institutions about schedule changes, assessment deadlines and important administrative details, and the mobile phone is more effective and efficient tool for communication [8].

This research aims to design a smartphone application that facilitates the registration process for the student and follow the results of the applicants, as well as, provide a student guide and guidance for all scientific departments in the college and branches. The importance of the research represents to solving the research problems related to the suffering of the students to get the university guide and their lack of knowledge of the date of the admission in the college. the need to exploit the potential of electronic development, especially in the field of smartphones. provide a smartphone application that sends notices acceptance of students and date of registrations, as well provide e-guide for college.

2. MOBILE TECHNOLOGY

Mobile technology entered the main stream in 2003 when globally the number of people subscribe mobile networks overridden the number subscribe of fixed lines [9]. There is a rapid increase in the number of mobile phone subscriptions, and the wireless communication tools for mobile phone is faster than any other communication technology [10]. Globally, there are 5.07 billion mobile phone users [11]. Smith [12] state that, around 92 percent of younger adults (18-29-year-old) having smartphone. In developed countries, mobile technology continues to exist among other ICTs, but in developing countries, main source of high-speed Internet for the population and may be the only technology people can access and afford [13]. The researchers agreed that mobile phones will be the essential way of provide services the future due to increase the number of mobile phone and internet users [14], [15], [16]. Nowadays, Smartphone allows users to store information, e-mail, and install programs, along with using a mobile phone in one device. The usage of smartphone has become one of the most widespread utilized cause these devices have ability to run a lot of application and access to services and information online [17]. recently, mobile phones have been the major technologies to access information source provided by government, or companies portal, applications and websites [11].

Smartphone offers a cell phone with more sophisticated computing capability and data connectivity where, it combines features of cell phone and Personal Digital Assistant (PDA) [18]. Smartphone has robust ability built on mobile computing and available on several platforms which include IOS, Android, Windows Phone and etc. Mobile applications are designed to assist the personal, and originations to provide services. The applications can be pre-instilled from the firm or downloaded from google play or apple store by users. there are three types of mobile applications are native applications, mobile web applications and hybrid applications [19]. Mobile apps are like computer programs or web application except it is designed to run on smart phone (mobile devices). Students can benefit more from these services because of their knowledge and experience in dealing with modern devices such as smart phones and the Internet, as the online services can provide opportunities to exchange information and knowledge and communicate information to them quickly.

3. M-Service

Around the world, the governments of different countries are looking to provide services to citizens, and enhance their participation. while the wired internet is complicated to reach to all cities (for example, rural areas). The mobile Government is the efficient solve to alleviate those hindrances [20]. Al-Hadidi [21] stated that, "M-government is a natural and inevitable extension of e-government" (p. 57). Mobile Government is fast gaining and prevalence pace and is being seen as the next wave for the use of ICT in offering the services. the recently years have attended a rise in subscribe of cellular phone in Iraq shown in (Fig. 1) As well, increase the percentage of using the internet in Iraq as shown in (Fig. 2):

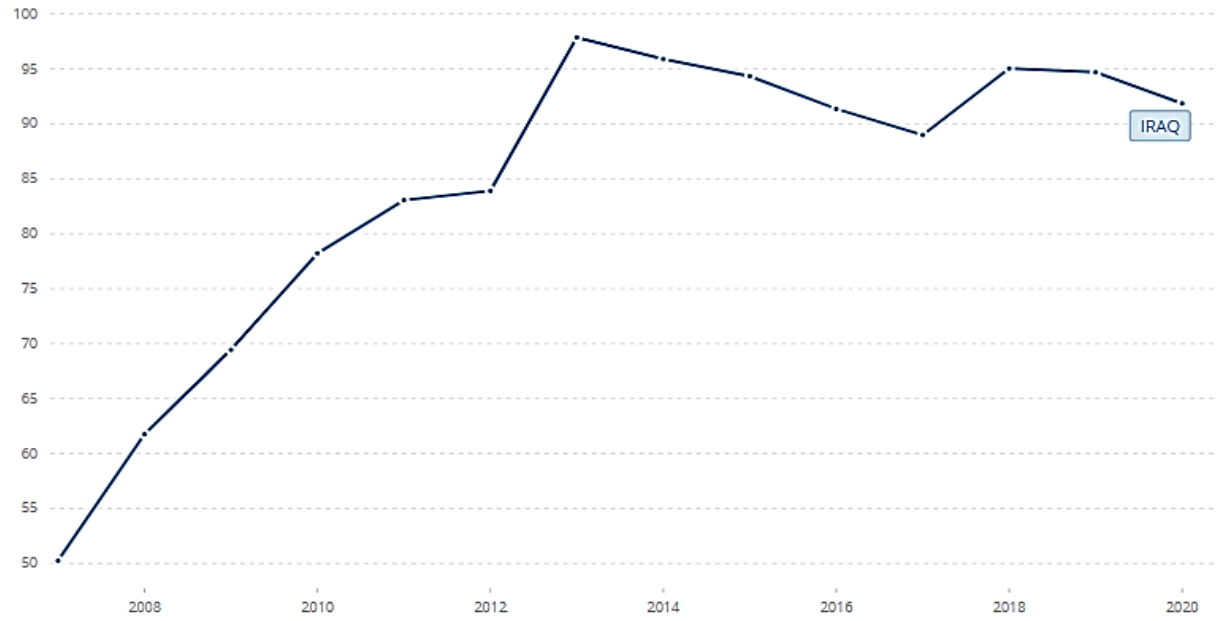


Figure 1: Mobile cellular subscriptions [22]

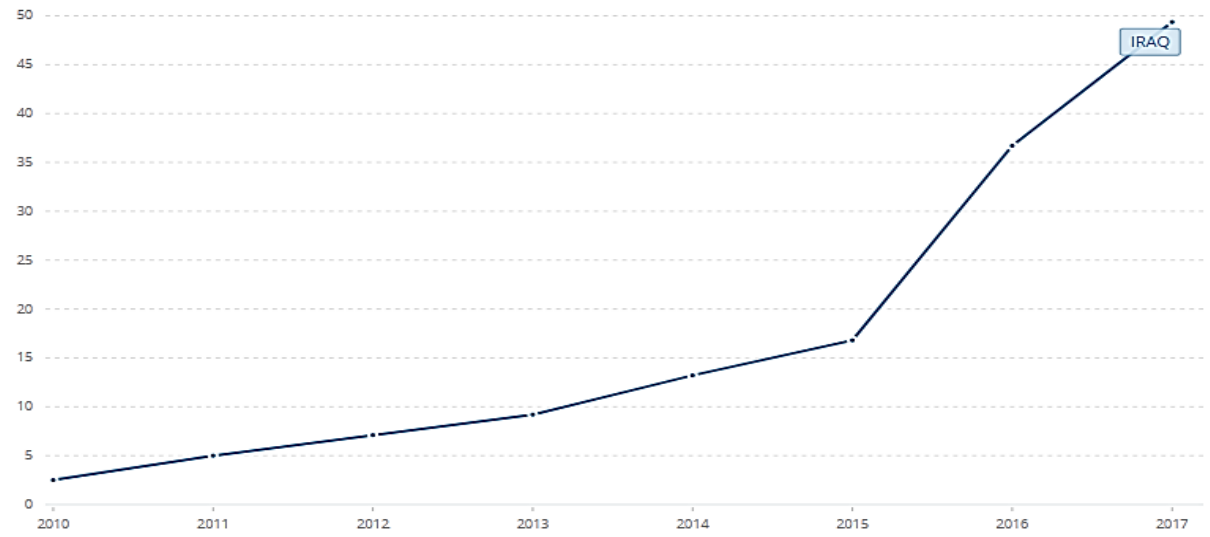


Figure 2: Internet use in Iraq [23]

From the (fig. 2) we can notice clearly increasing the using the number of internet users Sharma, Al-Badi, Rana and Mobile cellular subscriptions which allow us for Possibility to exploit. & Al-Azizi [24] stated that, Government entities consider the mobile applications the best method to deliver the services to the citizen at time. Mobile government facilitates delivery of government services in real-time to residents using easier methods [25]. The government should exploit the prevalence of smart mobile in iraq. M-Government is subset of the e-governmet that using the ICT and mobile (smartphones, PDAs) into surrender of inforamtion and services to citizen. there are four levels M-Government are represented by the following (fig. 3) [26]:

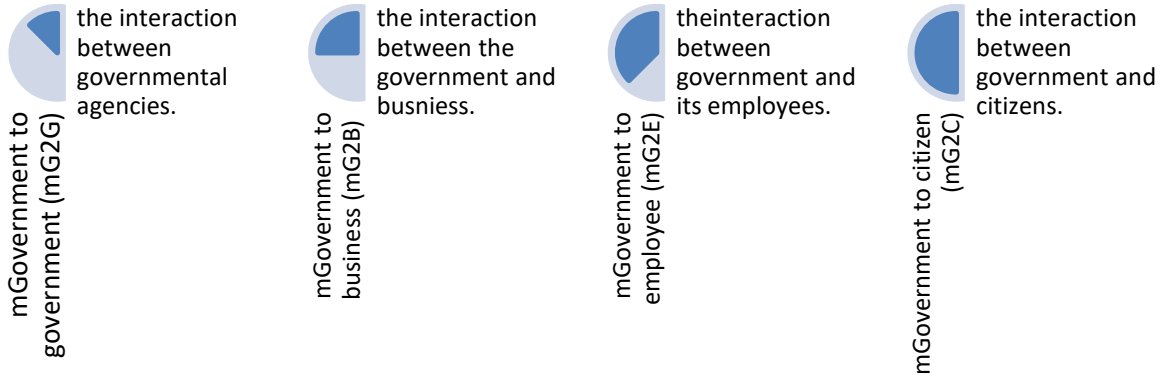


Figure 3: M-Government operates

The governments recognized the importance of the mobile techniques benefits potential utility and usability the Table (1) shown the cons of M-Government. Although the Governments of developing countries are increasingly seeking to expand the infrastructure for wireless communications and to provide information and services to citizens through mobile phones, the exploit of M-Government in the developing countries still insufficiency [27].

Table 1: M-Government benefits

Why prefer mobile Government	Increasing the numbers of mobile users.
	The ability of mobiles to provide Internet connectivity to users.
	Mobility.
	Low cost.
	Easy of using and learning.
	Easy of seting up the infastructure.
	inclusiveness and remote area network
	Improvig the electronic government effort.

WITH THE ADVANTAGES PROVIDED BY THE MOBILE FOR E-GOVERNMENT, IT CAN BE USED TO PROVIDE SERVICES. THERE ARE A LOT OF STUDIES USED MOBILE APPS TO SOLVE THE PROBLEMS THE TABLE (2) SHOWN SOME OF THESE INITIATIVES:

TABLE 2: MOBILE APPLICATION INITIATIVES

AUTHOR(S)	PROBLEM	OBJECTIVE	COUNTRY
ALAM, HADI AND NAJAM (2021) [28]	SOLVING THE PROBLEM OF LOSING CHILDREN BY PLACING PHONE NUMBERS ON THEIR WRIST IS NOT FEASIBLE, AS IT TAKES TIME TO FIND THE CHILD AND CONTACT HIS PARENTS, AND THERE IS A RISK OF LOSING THE CHILD OR KIDNAPPING HIM BEFORE REACHING ANY HELP,	DESIGN MOBILE APP THAT HELP THE PARENTS TO TRACKING THE CHILDREN AND REDUCING THE INCIDENCE OF CHILD LOSS	AL-MASJID ALNABAWI, MADINAH, SAUDI ARABIA
TSUNEMI, SATO, SUGIMOTO, IWAGAKI, ENOMOTO, SOMEYA	MANAGING THE NUTRITIONAL CONTENT OF DIABETIC PATIENTS IS IMPORTANT AND DIFFICULT TO LEARN.	MOBILE APP HELPS THE DIABETES PATIENTS TO CHOOSE NUTRIENTS THAT THEY CAN EAT	JAPAN

AND WATADA (2021) [29]			
WU, LIN, MAREK, AND OU YANG (2021). [30]	DIFFICULTIES FACING LEARNERS AND TEACHERS OF ENGLISH AS A FOREIGN LANGUAGE DUE TO THE COMPLICATED CONTENT.	DEVELOP MOBILE APPLICATION TO HELP LEARNING ENGLISH IDIOM BY USING VIDEO AND ANIMATION.	TAIWAN
TERHORST, PHILIPPI, SANDER, SCHULTCHEN, PAGANINI, BARDUS AND ET AL. (2020). [31]	THERE IS NEED TO EVALUATE THE MOBILE HEALTH APPLICATIONS SUCH AS THE CONTENT AND THE QUALITY.	THIS STUDY AIMS TO ASSESSMENT THE MOBILE APPLICATION RATING SCALE.	GERMANY
PAETOW, WICHMANN AND WIßOTZKI (2021) [32]	THERE IS NO MOBILE APPLICATION FOR NAVIGATION APPLICATION IN WISMAR UNIVERSITY	DEVELOP MOBILE APPLICATION FOR NAVIGATION IN THE CAMPUS.	GERMANY
FATAH, MOHAMAD AND RAHMAN (2021) [33]	THE ATTENDANCE RECORD IN UNIVERSITIES IS TRADITIONALLY (BY PAPER).	DEVELOPING ATTENDANCE MOBILE APPLICATION FOR STUDENTS' UNIVERSITY.	MALAYSIA

There are a lot of studies used the mobile apps to solve problems in various fields. The table 2 show that in iraq there is a gap in m-applications sector. This study attempts to maintain social distancing and facilitate the registration process by developing a mobile application.

4. METHODOLOGY

In the current study utilizes the methodology According to Vaishnavi and Kuechler (2008). The methodology consists from five Phases as shown in the (fig. 4):

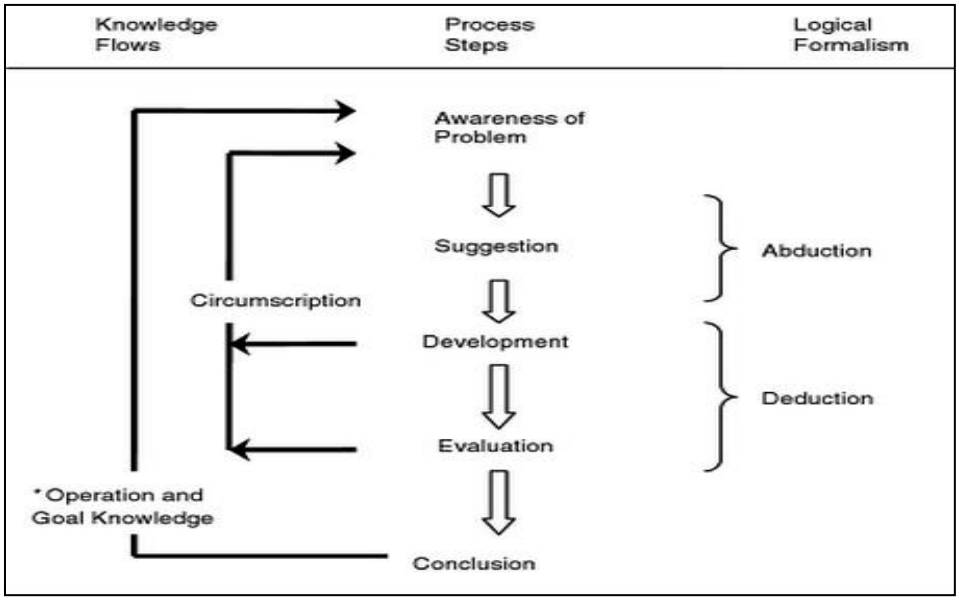


FIGURE 4: VAISHNAVI AND KUECHLER (2008)

4.1. AWARENESS THE PROBLEM

Awareness the problem adopted of the interview with manager of registration in Technical College of Management/ Baghdad (TCM/B), and some student. where indicate to that the lack in electronic registration services as a main problem in the TCM/B and also in Iraq's universities. This lack leads to the research problem and objectives.

4.2. RESEARCH SUGGESTIONS

In this point, mobile phone has been specified as the technology to be utilized to addressing the problem since it is vastly used at present and the application can be made available anywhere and anytime and can be link mobile with other device through Bluetooth. The study suggests utilizing mobile app which help students to provide the services, and inform them about the timetables.

4.3. DEVELOPMENT

The prototype application developed by using Flutter Android as platform and Dart languge for mobile development.

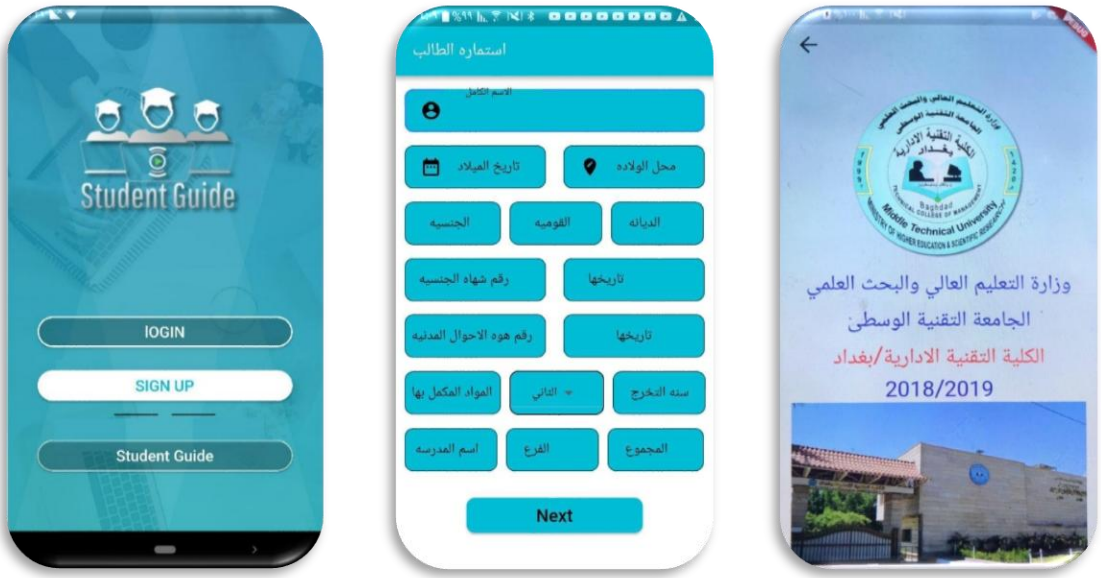
4.4. EVALUATION

In the evaluation phase, 30 students are going to assess the application, investigate and give their opinions about it to decide whether revisions are necessary or not. In this step had been questionnaire the students to be provides feedback on the effectiveness of the application. The questionnaires implicated measurements such as Usefulness, Ease of Use, and Usiblity. The questionnaires were adapted from (Davis, 1989; Kicken, 2008; J. R. Lewis, 1995, [34]. SPSS

version 18 was used for the statistical analyzing (evaluation the system). The outcomes have been discussed as the following:

5. DESIGN AND ANALYSIS

Mobile student guide is a application that facilitates the applicant student registrations with mobility as the main feature. this program enables students who want to applicant to register on the Internet from any place by using any mobile phone capable of connecting to the Internet without needed to go to the university to applicant the (Fig 5) shown the apps page.



Main page Pegistration page Student guide

Figure 5: app pages

The figure (fig. 6) bellow illustrates the mobile student guide can fill applicants form in TCM/B. indeed, if the student uses the application first time he can see the college guide and not need to register in application, as well if student don't have an account, they should be registered in application by entering username, password and his email. After that login to application through own account to fill up the necessary fields. the system would save the entered information in the database. If the student accepted or not, the system will send a notification to the student, as well, the registration procedure (such as payment) timetable.

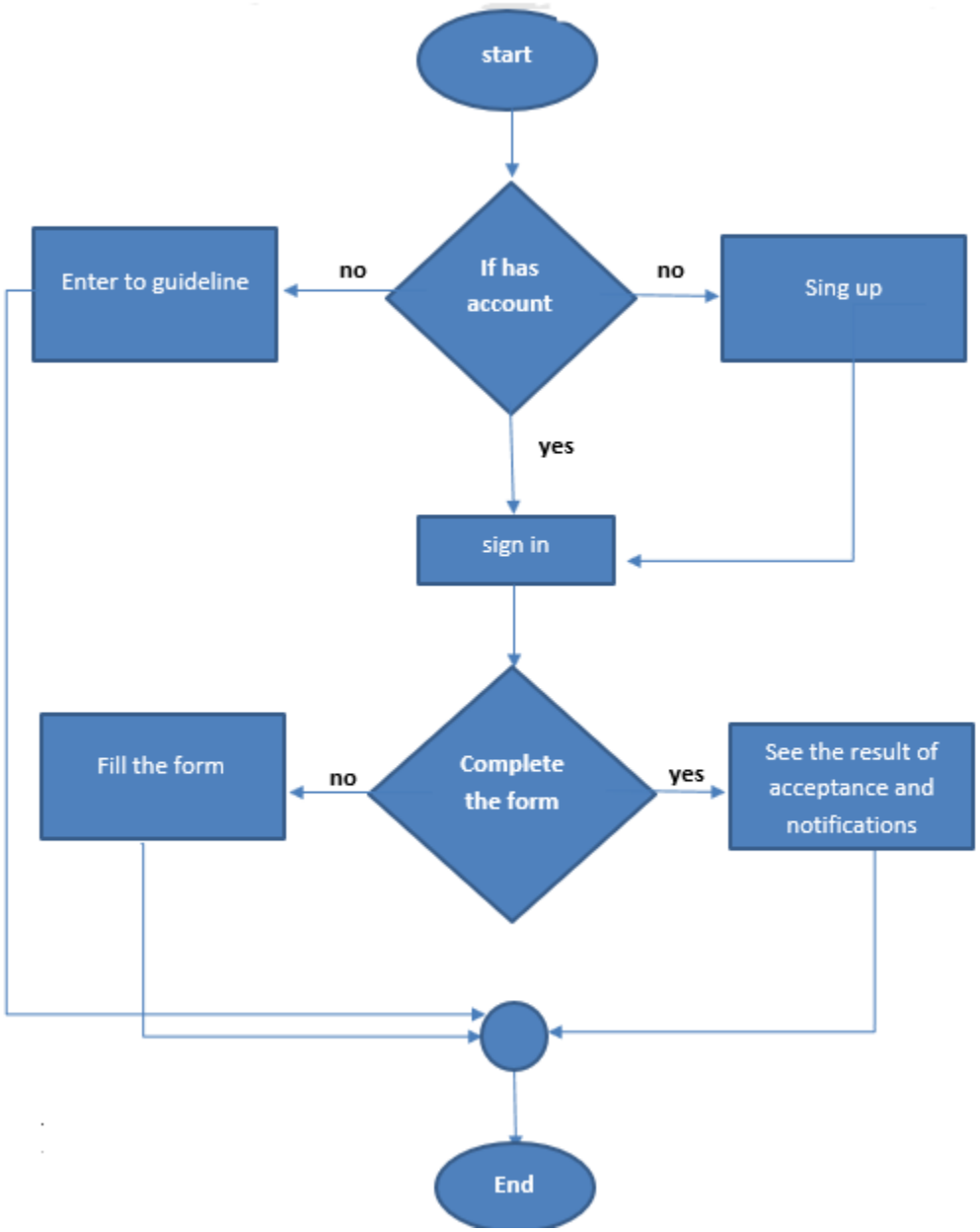


Figure 6: The apps process

6. Demographic Data

The respondents consist of 19 females (63.67%) and 11 males (36.33%) students. In terms of classes, 3 (10.00%) in the first class, 11 (36.67%) second class, 8 (26.67%) third class and 8 (26.67%) fourth class (fig.7) shown the demographic data. The respondents were as TCM/B students.

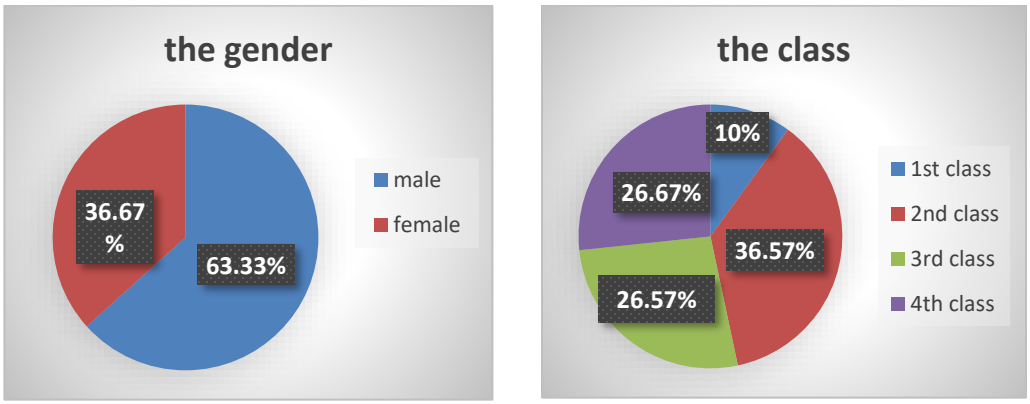


Figure 7: The Demographic Data.

7. the descriptive statistics

The descriptive statistics for all the measurements and items are presented bellow in table 3.

Table 3: descriptive analysis

Usability									
Items	**Measure**	**Strong Disagree**	**Disagree**	**Neutral**	**Agree**	**Strong agree**	**Mean**	**S.D.**	**Result**
Using the application helps to get to know the college departments and their specialties	**fre**	0	1	0	11	18	**4.53**	**0.681**	Strong agree
	per	0	3.3	0	36.7	60			
Using the application enable me to know the inputs of each department (the department accepts any branches (scientific, administrative, commercial)	**fre**	0	1	0	13	16	**4.47**	**0.681**	Strong agree
	per	0	3.3	0	43.3	53.3			
Using the application helps in selecting the section correctly	**fre**	0	0	3	15	12	**4.30**	**0.651**	Agree
	per	0	0	10	50	40			
The application enables me to fill the applicant forms electronical.	**fre**	0	0	2	16	12	**4.33**	**0.606**	Agree
	per	0	0	6.7	53.3	40			

The application enables me to know the dates of admissions and send notifications to the accepted students	**fre**	0	0	6	11	13	**4.23**	**0.774**	Strong agree
	per	0	0	20	36.7	43.3			
The app is reliable (I can trust it)	**fre**	0	1	8	13	8	**3.93**	**0.828**	Agree
	per	0	3.3	26.7	43.3	26.7			
Easy to use									
The use of the application is clear, understandable, and requires no experience	**fre**	0	0	4	12	14	**4.33**	**0.711**	Strong agree
	per	0	0	13.3	40	46.7			
Ease of use of the application	**fre**	0	1	5	16	8	**4.03**	**0.765**	Strong agree
	per	0	3.3	16.7	53.3	26.7			
The information (such as on-screen messages) provided with this application was clear.	**fre**	0	0	4	15	11	**4.23**	**0.679**	Agree
	per	0	0	13.3	50	36.7			
All the commands are easy and clear, and I have no difficulty in accessing the commands	**fre**	0	0	11	8	11	**4.00**	**0.871**	Agree
	per	0	0	36.7	26.7	36.7			
The writing is clear inside the application and the language is eloquent and does not require clarification	**fre**	0	0	1	14	15	**4.47**	**0.571**	Agree
	per	0	0	3.3	46.7	50.0			
Perceived Usefulness									
Using the application would enable me to accomplish tasks more quickly.	**fre**	0	0	1	7	22	**4.70**	**0.535**	**Strong agree**
	per	0	0	3.3	23.3	73.3			
Using the application would make it easier for me to register.	**fre**	0	0	4	7	19	**4.50**	**0.731**	**Strong agree**
	per	0	0	13.3	23.3	63.3			
	fre	0	0	7	11	12	**4.17**	**0.791**	**Agree**

I find the application useful in register and clarify the departments in college.	**per**	0	0	23.3	36.7	40.0			
application is suitable for both experienced and inexperienced students in register process and choose the department.	**fre**	0	0	0	9	21	**4.70**	**0.466**	**Strong agree**
	per	0	0	0	30.0	70.0			
I find the application adequate as needed	**fre**	0	0	5	15	10	**4.17**	**0.669**	**Agree**
	per	0	0	16.7	50.0	33.3			
Overall, I find that the application is useful	**fre**	0	0	5	12	13	**4.27**	**0.740**	**Agree**
	per	0	0	16.7	40.0	43.3			

Table 2 illustrated the descriptive statistics of the eighteen items questionnaire that were answered by the students after using the application regarding the easy to use, usefulness and usability. the results clarify that respondents were pleasant with using the application their answered were (strongly agree and agree). the high mean score =4.53 and standard deviation = 0.681. furthermore, the less mean score = 3.93 and standard deviation = 0.828.

8. CONCLUSION

The universities have been used smart phones in their field to provide service for both the employees and the students. The importance of e-services has increased rapidly. In certain circumstances, e-services can play a vital role and, in many aspects, especially during abnormal situations, COVID-19 epidemic is an example. The proposed application was implemented and tested in a real environment in the technical college of management/ Baghdad. The results showed that the application has a plausible level of acceptance among the students. Student were strongly agreed about the elements and the factors of ease to use, usability and usefulness. Adopting such applications open the gate towards more sophisticated trends that can serve students in abnormal situations and crisis. This study suggests that organizations should be adopt m-services and mobile applications, as well as the use of smart phones in the field of education. In the future, the prototype mobile apps can be improved to get more characteristics in different aspects such as electronic payment apps and other apps for colleges.

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