DESIGN AND IMPLEMENTATION OF STUDENT AND ALUMNI WEB PORTAL

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ABSTRACT:

The Information and Communication Technology (ICT) has witnessed great development in the recent years. Therefore, the design of Students and Alumni Web Portal (SAWP) involves the analysis of the internal and external environment of the three universities. For this purpose, SWOT technique has been used to detect the deep effect of environment factors on the strategic plan to discover the strengths, weaknesses, opportunities and threats facing the design of the proposed system. SAWP was designed using (MySQL, HTML, CSS, Java Script, jQuery, PHP, AJAX) techniques to provide robust portal system addressing two subsystems: student and alumni portal system. Testing of the SAWP was administered through two main stages: the first, to identify the student's views and their preferences. The second to measure the usability of the system through using System Usability Scale (SUS) method with subscription of 22 potential system users. The best results of SUS testing are: the rate of overall satisfaction was high nearly 80%. While the implementation outcomes found very compatibility and reasonable in wide extents between available data and system requirements.

KEYWORDS: Portal, Alumni, SWOT, Student Information, Dashboard.

1. INTRODUCTION

Information Systems (IS) are currently considered to be significant and indispensable resources for organizations so that they can continue to exist in today's "technology-focused environment". Organizations have devoted a lot of resources to empower and strengthen the IS infrastructure in order to offer better products and services (Gül, 2009). It has been noticed that many colleges, in their students information systems, use excessively paper records methods, which are traditional means of managing student data and they have several negative aspects and problems. These drawbacks are: "First, It takes a very long time to transfer the information to the student. Where it is displayed it should be displayed on the notice board and the student has to visit the notice board to check that information. "Second, paper records are non-value added activities, and also difficult to retrieve, alter, and re-file the paper records" (Bharamagoudar, 2013).

Accordingly, we think that the traditional system is not efficient enough and does not satisfy the beneficiaries (students) needs and requirements; it cannot also provide information in due time because it lacks the quality of ' integration and cooperation' between the involved bodies. This is why this paper stresses the need for an ' integrative flexible ' approach that is able to meet the needs and requirements of students' records and registration in a way that can improve the current student's portal system.

Based on the foregoing statements and according to interviews conducted by the researcher, the thesis problem reads as follows: there is a lack of automated connection among students and all the academic staff on one hand and alumni with the management of the universities under study on the other hand. Certainly, the lack of student portal and alumni portal system represents a major challenge to the advancement of the university.

The main objective of the current thesis is to develop a Students and Alumni Web Portal (SAWP) to secure data integrity and validity, increase efficiency and facilitate optimal use of ICT by staff and students in order to successfully achieve all the activities and operations within the college. The importance of the proposed student's portal system lies in the fact that this system academically addresses an issue which has become so crucial in sophisticated organizations especially in university environments aiming at E - government.

2. RELATED WORK AND METHODOLOGY

The current thesis is based on analyzing multi environments in order to design a proposed portal system. Accordingly, the researcher has used more than one style of research method (qualitative and quantitative) at one time to obtain the requirements. It is represented by a questionnaire and an interview which lead to access information directly and accurately using SWOT. Also, the researcher used; System Usability Scale (SUS) as a quantitative method to evaluate the implementation. Moreover, the researcher got some of the required data directly by using the observations tool in each system inside the university campus.

Review of the previous studies embodies a basic concepts that formed the theoretical framework of the thesis on the basis of the information system:

Ali (2009) , studied the problem of intensive commitment of time in both developing and taking Web-based courses, lack of face-to-face interaction between students and instructors. The study aimed to bridge both physical and time dimensions in order to bring the faculty and students together as a virtual community .The results of the study were useful and positive as they showed significant relationship between interaction dynamics and student learning, and satisfaction outcomes illustrated the importance of learner-instructor, and learner-learner interactions.

Chiang, Ahmad and Wong (2010), conducted a study to solve a problem faced by most of traditional university students presented by tacking all the courses or lectures manually by

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lecturers, also if a student asked a question or any help they would see the lecturer in person. The researcher used a questionnaire as a qualitative method to explore students' readiness in adopting online portal in the university. Therefore, the best result of the research was the students' attitude engagement with using internet was positive.

Ofoegbu et al (2014), examine and analyze the environment of the university under study in order to identify the problem that involved:

1. Lack of intersection between undergraduate students and staff.
2. No provision for any announcement or notifications for students to access.

In order to solve the problems, researchers developed a student's web portal using several tools such as WAMP packages where the Windows platform was the operating system, Apache was the server, while MySQL as database and PHP as the scripting language. This system could achieve specific objectives such as:

a. Controlling educational processes and ensuring security and data integrity.

b. Providing access to educational resources where students could use the web portal to access their subject materials online, check their emails and access library services.

BIN RADZI (2007) , conducted a study at the University of Malaysia to suggested a system that reduce long procedure and to ensure an alumni communication platform between graduate students with the following two main objectives:

1. To enable graduate students register alumni using WAP technology.
2. To enable graduate students share an information regarding their alumni.

The system was developed by using Microsoft Visual Web Developer, Microsoft Access as database management. The system also used Wireless Markup Language (WML) integrated with Active Server Pages (ASP) as a scripting language.

Karel(2013),illustrated in the study there are many drawback found in the old system to access the alumni such as : difficult to track all information of alumni member and connect with them after gradated. Therefore, the researcher design a system using technology such as MySQL for database, Java EE platform and Vaadin framework to design and implement an automated information system for alumni associations to achieve : create a communication medium in which all club members facilitate processing , utilize clear and transparent records of club members include email , phone , payments .

In contrast, the current proposal system is different from the previously mentioned studies by the following features:

1. It is a part of a comprehensive project that works within the campus and it requires coordination and compatibility with student information system as an infrastructure for the current system.
2. It chooses three universities, one of them is nongovernmental and two others are governmental, in order to get a real choice for the community of the study.
3. It adopts the concept of strategic planning and SWOT as a tool to analyse the internal and external factors in the environment under study.

The design of proposal system (SAWP) was in accordance with the philosophy of portal system. Therefore, SAWP involves the analysis of the internal and external environment of the three universities. For this purpose, SWOT technique has been used to detect the deep effect of environment factors on the strategic plan of the system. As well as, to discover the strengths, weaknesses, opportunities and threats facing the design of the proposed system. Table (1) contains the results of questionnaire analysis.

Matching and converting is the best utilization of SWOT. Matching always occurs when the analysis discovers a competitive advantage by matching the strengths to opportunities. On the other hand, converting is to apply conversion strategies to convert weaknesses or threats into strengths or opportunities. But in return, If the threats or weaknesses cannot be converted, the university should try to minimize or avoid them (Team,2013),(Lee,2000).

The following are the results of the process of matching and converting:

1. Matching: the results of the analysis confirmed that the desire and the urgent need for the adoption of both student portal and alumni portal system as strength, will achieve many competitive advantages for the University as an opportunity. This, without doubt, will keep up with the progress in the world and will leverage their expertise

2. Converting the poor performance of IT as a weakness, and also the non-adoption of strategic planning to improve their performance through their participation in the design of the proposed system as an opportunity. This naturally requires that IT investments must provide measurable and transparent value to the universities to gain a higher level of credibility as a competitive advantage.

3. Converting the challenges facing the applied environment and the lack of financial support can be turned into an opportunity represented by an automate Student portal System. In contrast, making use of Masters' students skills, currently available within the proposed strategic project, will in return provide a direct connection between students and faculty members.

3. DESIGN PROPOSED SYSTEM

The architecture of proposed system of this study has two complementary parts in terms of its physical design as illustrated in Figure (1). The first part contains the students portal system, which includes the possibility of online contact with academic staff and student affair unit within the college. The second part deals with engaging alumni in planning and decision-making processes as well as other important processes taking place in the college.
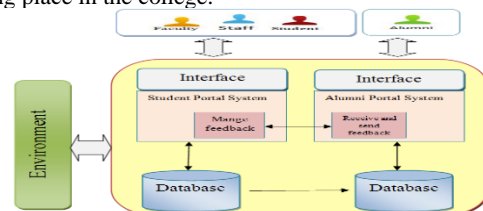

Figure 1. Conceptual framework of the proposed system

3.1 Students Portal system

The homepage of the student portal system is a point of access for the potential users. The page contains several options to access general information that all users can access such as: (Announcement, Upcoming Events, News, and Contact with admin and Services). The users can login to access their personalized portal account from the homepage portal. The admin of each departments, students and academic staff can register in the system by using user ID and password. The proposed system deals with four types of users:

1. Main admin that controls all the system and it consists of three sub-admin(s) connected with each other.
2. Admin of each department which manages the blackboard system, has also other privileges that are different from the main admin.
3. Academic staffs and employees of each scientific department and,

4. Student, who can log into the system by using a user code and a password; the code and the password, can be verified by the procedure in the system as each user-level page has options which are different from the other.

Table 1. SWOT Analysis Results

Helpful	Harmful
Strengths	Weaknesses
Sources of power that distinguishes universities and justifies their existence and secures their survival	Elements that pull of the total balance and the need to develop and improve performance
1. Willingness with urgent need for a student portal system. 2. Positive attitude among academic staff toward the design of alumni portal system. 3. Specialized skills represented by the Masters' students to participate in designing the Systems.	1. Much effort and long-time used up to satisfy students' requirements. 2. Absence of any contact with the alumni. 3. Shortage of adopting strategic planning, in particular in IT Units. 4. Lack of financial support. 5. Lack of knowledge and computer skills
Opportunities	Threats or Risks
'The vacuum which can be blocked in order to continue to \compete successfully'	'Elements that threaten the university development and its scientific abilities'
1. Design student portal system to keep up with developments in the advanced universities. 2. Strategic planning is now more important than ever at universities, especially at IT unit. 3. Open an Alumni association in the canter of the campus. 4.Develop new ICT technologies for more efficient communication between students and faculty members.	1. The communication revolution and dealing with a huge amount of data. 2. Shortage of long term planning within the universities under study. 3. The rapidly growing number of students and the diversity of disciplines affect the quality of services provided. 4. Competition works with effective ICT technologies between students and faculty members.

The current paper focus on the student user in detail after what has been preparing all the activities such as creating users and inserting required information by the first three users to implement the system. The post-graduate and under-graduate students must first register to access the available system options, figure (2) reflects student privileges in the current system.
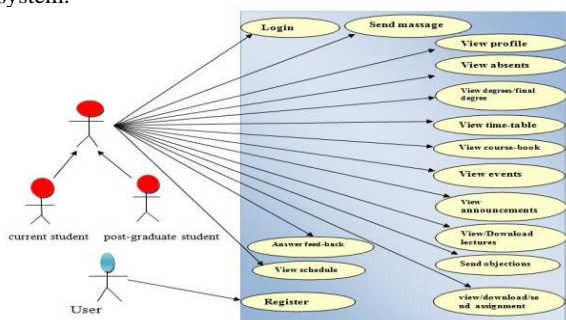

Figure 1. Use case of student privileges

After activation the account, a student (under-graduate, post-graduate) can then login the system. The student page contains the same elements that are included or shown in the academic staff page, with some differences which can be found in tools and lower permission as in figure (3).
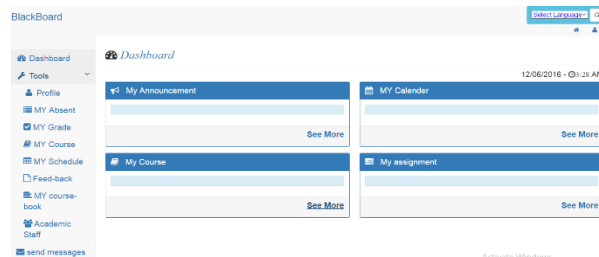

Figure 3. Student Page

Students can only view the announcements, events, lectures but without deleting or updating any options. In the same direction, students have a permission to send messages, send objection about his midterm grade out of 40%, absence rates and finally exams results. The student page also contains four boxes:
1. My announcement: Students can see announcements related to their subjects or their exams or any event happens in the department.
2. My Course: Students can see the last lecture uploaded with detailed information. In order to see all lectures, click on see more; a new page will appear as shown in Figure (4). Other information is available in this page such as code, name, and units of each subject with type of subject (annual, course).

Figure 4. View Subjects in each stage.

3. MY Assignment: in this box students can find all assignments for each subject as shown in Figure (5) .
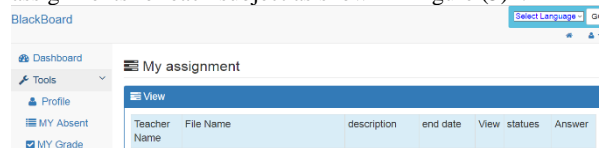

Figure 5. Assignment Page

Student can answer the assignment by clicking on answer option, a new page will appear as shown in Figure (6). Within this page students will be able to upload only one file with type (pdf, ppt or doc)
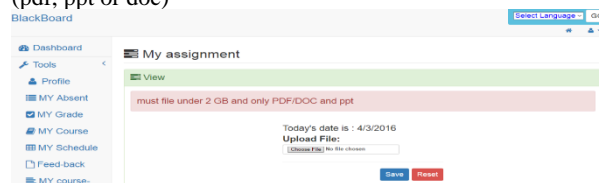

Figure 6. Answer Assignment Page

4. My Event: in this box student can find all the events that will happen. The student page also contains many tools such as:
1. Profile: when a student is registered in the college all his/her related information will be found. Naturally, students will not have permission to change or update this information.
2. Absence page: students with this tool can find their absence percentages for each subject as shown in Figure (7). Students have a permission only to send an objection about each subject.
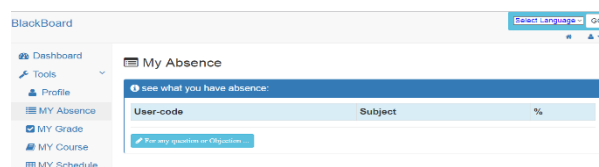

Figure 7. Absent Page

3. MY Grade: Students can see only his mid-term grade out of 40%, and they do not have a permission to see grade for any other student in his stage/class. Students can also send objection about each degree in a subject within a specified limited time or after (10 days) as shown in Figure (8).
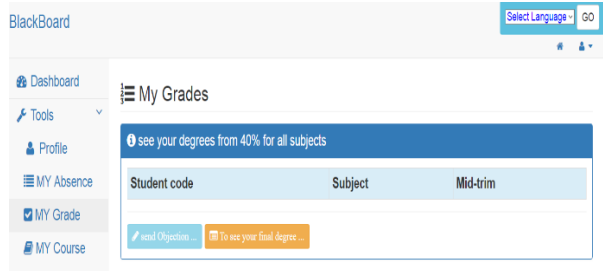

Figuer 8. Grade page

In the same direction, there is an option to access the final grade of all subjects at the end of the final exam in an active time the exam committee unit will specify.

4. My Schedule: By this option students can find types of schedules:

- Weekly schedules for study include time tables for each subject and lecturer
- Exam schedules include Semester and final schedule as shown in Figure (9).
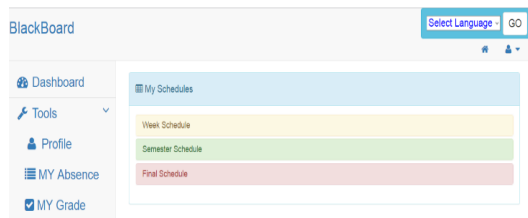

Figure (9) Schedule student page

E. My course-book: The course book for each subject can be uploaded by lecturers. Then students by selecting the subject can access the course-book in detail at the level of each department as shown in Figure (10).
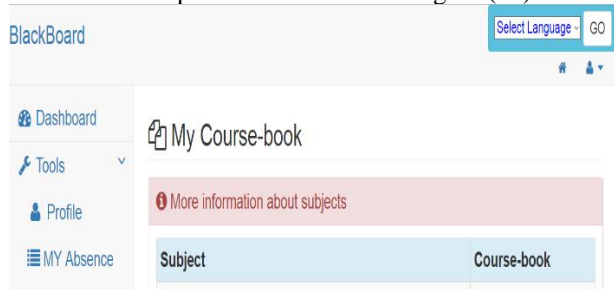

Figure 10. Course Book Page

f. Feed-back: When the admin of a department activates this option in a specified time; students can answer the questions online and can evaluate the performance of lecturers for each subject online.

g. Staff page: This option provides more information about the academic staff such as: name, email, time-table, office location and telephone. Certainly, this tool increases connections between students and lecturers and helps for any objection or questions student need from their lecturers as shown in Figure (11).
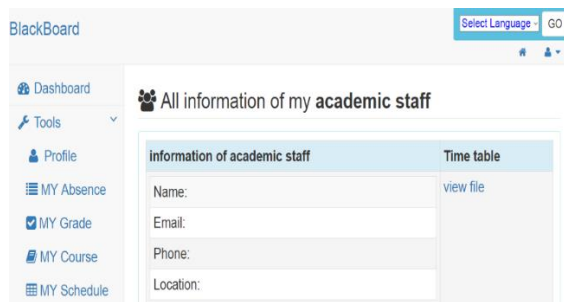

Figure 11. Academic Staff Page for Student

3.2 Usability of (*SAWP*)

According to ISO 9241, Part 11: "usability is the extent to which a system can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use". It is worth mentioning that progress and development taken place during the last decades in information technologies have turned the focus of interest from technical performance to service effectiveness and user satisfaction of information systems. The availability of relevant information is the key factors in decision making which allows obtaining rational decisions (Stoimenova,2010). It should naturally be understood that usability is not just the appearance of the user interface (UI). Usability is rather related to how the user interacts with the system, and it includes five basic attributes namely; learning ability, efficiency, and user retention over time, error rate, and satisfaction. Practitioners start the process by analysing the targeted users as well as the tasks those users will perform. The basic elements to measure the ability to use a system includes: (Ferre, Juristo , 2001), (Brooke,2013).

➤ Effectiveness: It is defined in terms of the extent of goal achievement, i.e. how much a goal has been achieved.

➤ Efficiency: It means the effort required to complete a certain goal or a specific task.

➤ Satisfaction; It is the level of satisfaction felt by users when using the system, and the extent of acceptance of the system as a tool to achieve its objectives.

Scoring the questionnaire yields a usability score in the range of 0–100. SUS is easy to administrate which makes it with its scoring accepted and popular among usability professionals (Annie; Honour; Alan ,2011)**.**

Table 2. SUS Score by the participants

Participant	SUS Score	Particip ant	SUS Score
1	60	12	80
2	80	13	70
3	100	14	80
4	80	15	80
5	60	16	90
6	100	17	100
7	100	18	80
8	100	19	100
9	100	20	90
10	75	21	80
11	70	22	90

Table 3.SUS Questionnaire

Items	Strongly Disagree	Strongly Agree
1. I think that I would like to use this system frequently.	-	22
2. I found this system unnecessarily complex.	21	1
3. I thought this system was easy to use.	-	22
4. I think that I would need assistance to be able to use this system	11	11
5. I found the various functions in this System were well integrated.	1	21
6. I thought there was too much inconsistency in this System	18	4
7. I would imagine that most people would learn to use this System very quickly.	1	21
8. I found this System very cumbersome and need high effort to use.	20	2
9. I felt very confident using this System.	2	20
10. I needed to learn a lot of things before I could get going with this System.	12	10

In the current usability test, 22 users participated in testing of the designed system and answered the SUS questionnaire as shown in Table (3). According to the survey results the SUS score was calculated as shown in Table (2).Table (2) indicates that the minimum SUS score is 60 and the maximum score is 100. Therefore the total score of SUS is 80% implying that (SAWP) is generally in accordance with the rules of the SUS tool in which 70% is an acceptable ratio.

Potential users indicates that the overall satisfaction of (SAWP) is high: it is in accordance with the high score given in (Q1) and they expressed a high desire to use this system frequently or in future. Furthermore, the participants find that the system is easy to use (Q3) and they disagree with the complexity of the system as reflected in the answers to (Q2). Moreover, the answers of participants to (Q9) indicate that the users feel very confident in using this system and it is consistent with the satisfaction of the users. 50% of the participants considered they would need assistance in order to be able to use this system (Q4). This is due to the fact that most of the participants suggested that they need to develop their skills in order to accommodate with the system efficiently. This suggestion is often consistent with their request through the interview in (Q10). Participants agree by 95% in (Q5) that the system operates with integration and coordination in order to achieve the main objective of overall system. Also this is often consistent with answers to (Q6) as there they confirmed that the system modules are characterized by consistency. All participants in (Q7) agreed that the process of learning how to use this system is very quick i.e. (21) Of the users answered with "agree". In contrast to (Q8) where (20) of the users responded with "disagree" about the content of the question.

3.3 Alumni Portal System

The proposed system provides an ability to register alumni online or at a self-reliance at universities under studies. The alumni portal system deals with two types of users as follows:
3.3.1 Alumni administration page: The system uses administration that gives high level of authority to manage and control the user accounts and all activities of the overall system. Figure (13) shows the admin (control) page which consists of many privileges; it is addressed in detail through the following parts:
➤ In the header of the page and through the notification of all changes (edit, delete, add) that other admin did will appear in the notification tab with full information such as (who does that, which time, what changes have been made).
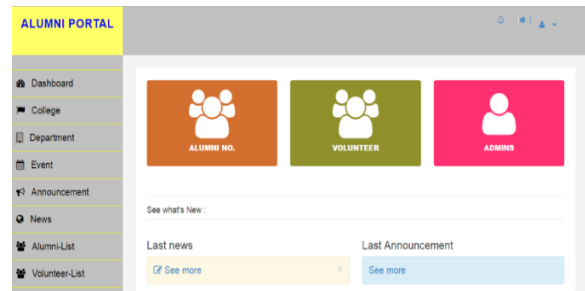

Figure 13. Main admin page (CP) of alumni portal

➤ List of Services : this menu contains the following items :
a.Dashboard : composed of three boxes; each box contains important information helps admin to easily control details such as (count number of alumni register, volunteer and admin). Within this page the admin is able to view the last announcement and news. The admin can also access the announcement on the left side menu by clicking on announcement or news.
b. There are common tools that each admin needs in order to provide information required for managing the system such as (college, departments, news, and events, backup).
c. Announcement: this provides very necessary information for all alumni such as information about a new workshop, international conferences and any information the university wants to inform graduates
d. Alumni list: this option informs the admin with the number of the alumni who have been registered in the system and the information related to the signup time for each one as well as how the admin can help them if they have any problem.
e. volunteer list: this option contains the necessary information of people who donated money, buildings, equipment, efforts and expertise to support the university. It is very important for any university to give a right to its volunteer's .In this page, the admin can manage the role and the type of the volunteers (person, company .etc) to obtain all the information required.
f. Current Work. By this permission the admin can see how much an alumnus works within his/her specialization or far from. This information helps the university to plan for the development of the educational subjects, especially for opening new specializations that meet the needs of the environment.

3.3.2 Alumni members: Every member of the alumni association can access his/her account after the registration process and the activation of his/her account. Naturally, joining the alumni association requires that an alumnus should pay the annual subscription for registration. In the current system, it is done manually because a credit card use is not easily available in Kurdistan regain. After the member has logged in successfully, all the elements will be activated for data entry. The following are details of each paragraph:
a. The header page contains a link; through this link alumni can access: the homepage, new notifications, friend request.
b. On the left-side alumni can change their profile picture by clicking on photo and select a new image.
c. Search: alumni have permission to search and see other members or his friends.
d. Profile: alumni can access their profiles and have a permission to change some information. Moreover, alumni can update information related to the address and location of their work. Within the profile of the member an alumnus has authorization to change his/her password by entering the old password and the new password.
e. Friend: after alumni search for a member, he /she can see his friend then request him as a friend from the friend page
f. Create event: Alumni can create an event and send it for his friend that he/she selects from the select box, naturally, the events are invited by other friends.

g. Library: the system grants permission to the members to access the library services by clicking on the library link.

If a member wants to interact with friends by making comments on his status, he must click on his name on the header page then he/she will go to the main page. In addition to that the propose system is designed in two languages Kurdish and English; when choosing a specific language, the whole system processes will turn into that language.

4. CONCLUSION

The review of the previous studies revealed that the proposed system varying from these studies through containment of two sub-portal systems, each system is completely autonomous in its functions, but integrated with each other to achieve the overall objective of the University. The SWOT analysis indicates the more prominent opportunities for the university is to develop new ICT technologies for more efficient communication between students and members of academic departments and others service units. The strength, there is willingness and urgent need in all universities under study for a student's portal system, in addition the positive attitude among academic staff toward the design of alumni portal system, also the lack of planning strategic for the design of portal system within campus and the IT unit, which show the inability of The IT members to perform their duties. The Actual testing and implementation of the SAWP confirmed that an automated student information system is considered the infrastructure to apply any portal system, as well as, the potential users indicate that the overall satisfaction of current system was high (80%) according to the high scores in most of the questions directed to them. The results of applying SAWP confirmed that the support of the top management is a critical requirement to successful implementation of the current proposed system, also the results of implementation confirmed that all users will easily and simply access to the specific data, with access to the percentages list of their absences and final grade online that overcome of distance problem. By proposed system student can answer the questions of feed-back online to evaluate the performance of lecturers for each subject online. Results of applying SAWP confirmed that student can answer assignments online that help student to send the assignment without need to open other programs or website. The design and implementation of current system has given rise to further research topics which demand a profound investigation in the future, like activate the (IT) unit to teach the employees in the university to develop their computer skills, as well as the IT members should be a partnership with programmers in training courses and follow-up the operations to apply the system efficiently and effectively. The designing a data mart within data warehouse to store all the information related to the student's lectures and alumni activities to fulfil all their requirements in future, also adding online quiz system and chat system for both systems. Finally design a procedure for electronic payment.

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