A Comparative Study between the Academic Information System of King Abdulaziz University and other Saudi Arabia Universities

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Abstract: In the current times, Information Systems (IS) are becoming major part and parcel of every growing institution. As a result of the highly number of users and ever growing volumes of data, there is an ever growing need to incorporate reliable systems to provide the required services by the institution in terms of data acquisition warehousing and security. In King Abdulaziz university (KAU), the Academic Information System (AIS) plays an important role as it foster a data management environment that is robust and can be expanded according to an organizations' strategic plan for information processing. So, the AIS are seen to be a powerful tool in the present scenario of online academic services. These services are provided by many leading universities all over the globe and feature many utilities and approaches. This article will critically analyse various AIS in the leading institutions of Saudi Arabia with reference to KAU AIS. Also, this article search for investigating the justification for AIS benefits. The case study strategy was used because it is more practical for business and management research; where.it engages in the empirical investigation of a specific phenomenon in a real-life environment, in addition to multi-source methods of data collection. This strategy helps achieve a greater understanding of the research context and process and answers 'why', 'what', and 'how' questions due to its capability of using multiple methods, including interviews, documents, and observation, to collect data. Finally, it was concluded that the existing AIS supports the real-time multi-processing environment within KAU through using the concept of time-sharing application where Time-sharing application allows for the prioritizing of applications based on user-id and system priority assigned to an application, device, and database or system catalog. These features are important to the university because it process transactions while developing and testing program applications. In a multi-processing environment, various faculties, departments or deanships can have access to the system at the same time intervals.
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1.Introduction

Information Systems are combinations of hardware, software, personnel, user-data and critical rules brought together to serve a certain purpose. The basic function of this system is acquisition of data, storing of data, processing of data and furnishing of data on request (Lucier et al 1988). In an age of information technology and data being available over the World Wide Web, Information systems are being incorporated in almost all kinds of institutions to solve data needs and information relay to users and administration as and when required (Hayes and Sharma 2003). Such Information Systems have many advantages for the organisation as well as the user. One advantage of such a system is the amount of time it saves in terms of acquisition of information, presentation of form and information and processing of the data (Culnan, 1987. An Information System is supposed to be reliable, user-friendly, secure, and versatile and should be able to furnish data securely. When the word versatility is mentioned, it refers to a systems capacity to adapt to different platforms, environments and situations (Hayes and Sharma 2003). The more adaptable a system is the better its performance (Jessup and Valacich 2008). However, versatility must be coupled with security to keep the system functioning reliably and under dictated protocols. Such features can prove to be highly advantageous for the organisation in terms of business as well as business image.

With all the advantages, versatility and utilities of an Information System enumerated above, an organisation can draw many benefits by investing a custom Information System service of their own (Dostal 2007). Security is another issue that raises interesting queries about Availability, Integrity, and Confidentiality (Yu n.d. 4). Apart from the features and the security measures incorporated in an Information System, a crucial aspect must be carefully tended to in order to get a better and more resilient system service (Green 1983). This aspect is the incorporation of codes of operation and conduct for

the programs as well as the personnel who monitor and operate the system. These codes and rules are to be laid down by the administrative authorities for the personnel and users working on the system to follow (Hayes and Sharma 2003). This can make the system more reliable and reduce downtime as well as avert man made damages to the system software.

An Academic Information System, as the name suggests, is an Information System dedicated closely with the activities related to the academic scenario from library records keeping and reference material issue and availability, displaying notices and results, to providing various services to faculty and students (Hoganson 2001). In short, an Academic Information System is meant to cater to the needs of students, faculty and prospective members of an educational institution (Hayes and Sharma 2003; Sage 1968). Early Academic Information Systems emphasized more on the references and library section and made reference material and research work available to students and staff online (Cooper 1983). These systems were dedicated to document and analyse reference material being issued and books available at the library shelf. Sophistication of interfaces added other utilities to this seemingly simple system of data keeping (Jessup and Valacich 2008). In the present-day scenario, Academic Information Systems may have many features tailor made to suit the needs of the institution (Culnan 1987).

An Academic Information System can carry any number of functions that the administration may wish to incorporate (Jessup and Valacich 2008). However, being an Information System (IS) service, an Academic Information System service must also carry the features that every reliable Information System service is expected to carry (Hoganson 2001). Therefore, colleges and universities that provide with Academic Information System services, are expected to take special care while deploying such services over the Internet (Dostal 2007). King Abdull-Aziz University (KAU), Jeddah, is ranked amongst the top 500 universities in the world with over 40,000 students, including undergraduate, post graduate and fellowship students, and 2500 members of the staff. The university provides on campus as well as off campus study opportunity for its students and has a vast curriculum to offer.

The university provides various facilities, the most intriguing of which is the Academic Information System that the university has put up over the years for use by faculty and students. This Information System provides opportunity to members as well as visitors to get relevant information related to the university campus and curriculum (Lindberg 1988). There are several other universities in Saudi Arabia that are acclaimed for the quality of education they provide in their curriculum. Some of these universities, the King Saud University, Riyadh, the Umm Al-Qura University, King Fahd University of Petroleum and Minerals, Dhahran and King Khalid University, Abha for example, also provide their students, faculty and prospective members of the institution with Academic Information Systems services. These systems have many similarities and differences with King Abdulaziz Universities Academic Information System. Although some of these Academic Information Systems services are comparable to world class Information Systems being developed in Western universities (Kock et al 2002), this report will focus on the Academic Information System services developed and provided by the above mentioned universities.

This article will critically analyse the salient features of Academic Information System service provided by King Abdulaziz University and briefly compare it to Academic Information System services offered by King Saud, University, King Fahd University of Petroleum and Minerals, Umm Al-Qura University and King Khalid University based in Saud Arabia. A short discussion of what an Academic Information System must carry in terms of usability and reliability will follow in the proceeding section, followed by a brief comparison of Academic Information Systems provided by the above mentioned universities.

2.   Academic Information System Description

Information Systems as described earlier are combinations of hardware, software, personnel, user and organisational data and critical rules brought together to serve a certain purpose. With the present fast moving age data can be made available from any part of the world using the World Wide Web, Information Systems have begun to find great utility in almost all kinds of institutions. Information Systems have also become a part of the Academic are being incorporated in almost all kinds of institutions to solve data needs and information relay to users and administration as and when required (Hayes and Sharma 2003). Need specific Information System have a great utility for the organisation that employs it as well as their users who use the system (Barnett et al., 1988) One advantage of such a system is the amount of time it saves in terms of how data acquisition of the information is done, form presentation and information presentation and processing of the data (Hoganson 2001). An Information System is supposed to be reliable, user friendly, secure, and versatile and should be able to furnish data securely.

An Academic Information System is essentially an Information System that deals with activities

related to an academic institution (Stead 1988). Such a system is expected to carry out various processes and must exhibit certain functionalities that can be used as parameters of comparison. In essential, an Academic Information System must cater to the needs of a specific user base that is the student, faculty and administrative members of an academic institution (Alter 2003). A brief discussion of the needs, features and functionalities expected from such an Information System is discussed in the following text. However, being an Information System an Academic Information System must exhibit some key features that may be used to evaluate its effectiveness. The system must be secure, usable over various platforms, should be less cumbersome and should carry enough detail for its users to navigate through the system easily (Hayes and Sharma 2003). The analysis of all the five Academic Information systems will be based upon some of these features.

An Academic Information System has to cater to the needs of students, faculty and administrative body over the internet. Academic Information Systems have the advantage of being tailor made according to the needs of the institution (Alter 2003). Apart from this Academic Information Systems can be modified from time to time. This helps the system to remain up to date and provides better functionality with changing technology and needs of the user. Being a part of an institution which provides such service automatically entitles the person to such services (Hayes and Sharma 2003). Such a user base can have a wide spectrum of needs (Lee 1991). These needs may include availability of forms, declarations, curriculum, form data, records, study material, schedules, featured content, institutional information, gazettes, faculty member and featured member lists, etc.

There are certain deliverables that an Academic Information System service must provide at all times of its functioning. First and foremost an Academic Information System must be able to deliver its user with secure access to the service tools available in service. This can be availed through secure logins at the homepage of the Information System website, verified by servers provided by the institution. Secondly the Information System should carry ample information relevant to the needs of a visitor to the website (Hoganson 2001). This website should prove both as a crucial data centre as well as a gateway for users to information related to their queries. The second important deliverable is the availability of the services at all times. The system should be available at times for its users to access and provide acceptable performance, especially in peak hours. The third deliverable that the service must provide is safety of data. The data must go through secure channels and should be properly encrypted and decrypted to

minimise leaks and pilferage (Jessup and Valacich 2008; Goldstein 1983). Another important deliverable is a reliable team of personnel to monitor and administer the service at all times. Yet another deliverable is the compatibility over various platforms of electronic media. With expansion in number and types of electronic devices that can access the internet on the go, numerous platforms have been developed that run different technologies, dialect sets etc. (Hayes and Sharma 2003). The Information System should be able to handle requests for access from various platforms.

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Although all these deliverables apply to any Information System service, since this particular Information System pertains to academics, a lot of crucial information is at stake (Jessup and Valacich 2008). Therefore, information flow should be reliable and the administration able enough to handle all the information efficiently (Kock et al 2002). Although all these deliverables apply to any Information System service, since this particular Information System pertains to academics, a lot of crucial information is at stake (Jessup and Valacich 2008). Therefore, information flow should be reliable and the

administration able enough to handle all the information efficiently (Kock et al 2002). Apart from the deliverables there is a spectrum of service tools that Academic Information Systems must carry (Van Hine and Pearse 1988). These tools include data warehousing, interactive sessions, regular update, counselling services, faculty information, faculty area, research databases, private profiles for users, information regarding training and certifications, private journals for students and faculties, notice boards, form filling services, forums, Frequently Asked Questions page and feedback sections etc. (Kock et al 2002). Such service tools and many more can be integrated into an Academic Information System to make it dynamic and functional according to the needs of all users. Apart from the deliverables there is a spectrum of service tools that Academic Information Systems must carry (Van Hine and Pearse 1988). These tools include data warehousing, interactive sessions, regular update, counselling services, faculty information, faculty area, research databases, private profiles for users, information regarding training and certifications, private journals for students and faculties, notice boards, form filling services, forums, Frequently Asked Questions page and feedback sections etc. (Kock et al 2002). Such service tools and many more can be integrated into an Academic Information System to make it dynamic and functional according to the needs of all users.

Academic Information Systems may have different utilities for different institutions (Lee 1991), but there basic functions are similar (Werner 1983). These basic functions are tor provide appropriate study material and an environment to feature researches, connect students, faculty and administration together and create a common data warehouse that can be used through certain privileges (Broering and Hendrickson. 1986) (Culnan 1987). These are several parameters that can be used to analyse the effectiveness of an Academic Information System service and its quality (Jessup and Valacich 2008). Some of these parameters have been discussed in the previous paragraphs. The reason that King Khalid University, King Saudi University and Umm Al-Qura University have been chosen for this analysis is because these websites showcase their own web based Academic Information Systems, are based in the same region and have a similar kind student and faculty group. The following sections will analyse the Academic Information System service and some of its common features available in three different universities in Saudi Arabia, the King Abdulaziz University, King Saud University, King Khalid University and Umm Al-Qura University.

3.   Brief   Walkthrough   Of   Academic Information System Services

King Abdulaziz University is one of world's leading universities and provides academic curriculum to more than 40,000 students in various on campus and off campus courses. With different campuses for male, female and off campus candidates, the university has developed a comprehensive Academic Information System service that is one of its kind in the region. The system has various features to offer. A comparison of similarities and differences of the Academic Information System features for King Abdulaziz University, King Fahd University of Petroleum and Minerals, King Saud University, King Khalid University and Umm Al-Qura University is done through an analysis of both technical as well as aesthetic features of the systems in the following text.

On the technical front, the first feature of this Academic Information System is its cross platform supportability. King Abdulaziz University's webpages are created using ASP scripting and therefore scalable and stable on electronic cross platforms. In comparison to KAU's website, Umm Al-Qura University's website is built on javas-script platform and King Khalid University's home page is built on simple html scripting. King Abdulaziz University's webpage has a support for different electronic platforms, from computers to mobile devices. However, the webpage for the Academic Information Systems for the other two universities are comparatively less stable over varying electronic media.

3.1. Salient Features and Similarities Between the three Academic Information Systems

The King Abdulaziz University Academic Information System has various service tools incorporated in its Information System which provide different functionalities to the system. The first service tool is a password protected profile that allows access to various other service tools in the system (Braude 1983,). This service is also provided in the Academic Information Systems provided by Umm Al-Qura University and King Khalid University. A password protected login to profiles is necessary to help keep private information related to the institution and the individual safe.

The system is available online in various languages i.e. Arabic, English, French and Spanish. In a parallel comparison, King Fahd University of Petroleum and Minerals, Umm Al-Qura University (Umm Al-Qura University) and King Khalid University have a system support for Arabic and English languages only. Being an internationally acclaimed university and students applying from all over the globe, King Abdulaziz University made a good decision to provide support for multiple

languages majorly spoken across continents. This measure helps students speaking foreign languages to understand the Information System better and use the various service tools provided by the system appropriately. The King Abdulaziz University home website carries buttons at a convenient location for changing the website language for students and faculty to view the website in their preferred language. For King Saud University, the language translation is

fairly stable and full translated page versions are available in both Arabic and English. The pages are simple and static and load very fast. In case of Umm Al-Qura University and King Khalid University, language buttons are available for home pages only and support only two languages - English and Arabic, or external translator service is required to change the language of the website to a preferred one.

Fig. 1.1 The King Abdulaziz University Website Homepage

A unique feature and a similarity between the Academic Information System of all the five universities is the incorporation of an "Enjaz" option at the home page of the respective websites. All the three universities support online application for Enjaz Registration, an important step in documentation for VISA applications to Saudi Arabia (King Abdulaziz University). This feature is incorporated to help students and individuals from other countries to visit the university campuses. Another similarity between the Information Service is the availability of Frequently Asked Questions feature along with comprehensive descriptions of courses and curriculum offered at various institutes on their respective campuses. Most of these descriptions draw parallels in standards to Western educational system in terms of planning and design to allow for students on transfer hours to settle in faster. Yet another similarity is the frequent news update of developments happening at the university campuses in all the universities. These reports include new sanctions, up-coming events, new rulings, highlighted study completion, job openings, declarations etc. (Culnan 1987,). The system carries declaration of university objectives, contacts and important phone numbers and emails. The websites also include site maps and college campus maps for students and faculty convenience (King Abdulaziz

University). However, these are only a few service tools that are similar in the three services.

King Abdulaziz University's Academic Information System services encompass a large number of tools that can help students and faculty by providing accurate information from the university databases or collecting information for processing and storage. These services are listed on the home page of the KAU website and are listed under different tabs (King Abdulaziz University). Under the KAU management tab, various options deliver information regarding different university offices, including University President's office and its various subordinate offices, University Vice-Presidency and all the legal bodies and functionaries under it, followed by Deanship of Girl's Campus and various other Vice-Presidency offices (King Abdulaziz University). Each of these open up forums and information pages that can help students, faculty and prospective members to get a gist of the administrative structure of the institution. All this data is made available through the Academic Information System itself.

The Academic Information System also provides functional application forms for students, faculty and individuals seeking education or job opportunities (Hoganson 2001,) at the KAU campus. These forms are appended into the system databases for further

processing through secure web transfers (**Academia.edu**). The latest version of the system provides secure browsing and secure web transfers. The system is subdivided into four tabulated categories that are made available by clicking at the E-Services option on the home page or by logging into the web server through a unique identification and password. These categories are Student Services, Academic Staff Services, Administrative Services and E-communication.

3.2. Academic Information System Tools Employed by King Abdulaziz University

The Academic Information System hovers around the Student Service Tool class (Lee 1991). The Student Services tool class of the Academic Information System provides various options (King Abdulaziz University). These options include links to creating and maintaining personal websites under Content Management System MARZ, the Content Management System MARZ, ERS-mail services, Anjez (Enjaz), KAU Student Forums, Online Services, Student and Academic Staff on Demand University Services ODUS, CENTRA – the virtual classroom service, E-Management Education System, System Transactions graduate for students, and Blackboard system administration to e-learning. Access to these services are available to students through the student unique identification login (King Abdulaziz University).

The Academic Staff Services tool of the system provides various service options for faculty (King Abdulaziz University). The service options include ODUS, CENTRA, MARZ, Anjez, Educational Affairs System, Candidate Nomination, Library Programs, Graduate Studies Service System and Performance Management System (King Abdulaziz University). The Administrative Services tool provides utility to the administrative staff. At this tab the administrative staff can check Anjez, Memos and Orders, Bids, job applications, Staff Management and Location Query, Mass SMS system, MARZ Strategy, Comprehensive content management system, Candidate nomination, electronic library and electronic forms (King Abdulaziz University). The last service tool, the E-communication tool lets the user check various application statuses, troubleshoot problems in ODUS systems and contains useful links to social networking websites. This service is a shortcut link to all the web communication services available under the KAU Academic Information System (King Abdulaziz University).

The Academic Information System is thus mainly divided into three main services, the Student and Staff On-Demand University Services ODUS (now ODUS PLUS), the virtual classroom services CENTRA and the online data warehousing and web management services MARZ (King Abdulaziz University). Another feature of the Academic Information System is its integration with Academia.edu web services, an online database for study and research material available to students and faculty for online reference and study material submission (King Abdulaziz University). The ODUS PLUS service is meant for student and faculty special requests. The service is versatile and helps provide electronic forms for special requests to administrative authorities, get updates regarding new notices and upcoming events and apply to new courses etc.

The cross platform feature is also incorporated in this service as well, with availability of android Operating System based applications (King Abdulaziz University). The ODUS PLUS service is one of its kind and its service quality can be measured from its popularity on Google analytics on Google Play store. The system is reliable and is user friendly and its availability in different languages makes it easy to navigate for students with non-Arabic background. With a global perspective in place this system is truly an example of far-sighted approach towards education at a global level.

The second important tool in the service is CENTRA, a virtual classroom environment that allows students and faculty to interact with each other over the web. CENTRA allows students to attend classes hosted over the internet from different locations and is particularly useful in the off – campus scenario. The tool comes with System Check and Tutorial options to help students and faculty members to familiarize and run the tool smoothly on their devices. The tool carries three options of Virtual Classes, e-meetings and Web Seminars, becoming a complete on the go distance learning package for off campus students. With this Information System service, students can attend lectures that would not be possible physically and they can avail interactions with expert faculty members across the university to clear out concepts and build a better knowledge base. CENTRA is a highly popular web service with KAU students.

The third tool in the service is MARZ. KAU uses MARZ system, a special content management system on the Internet especially built for functioning in fields of science and technologies. MARZ system has various portal web applications that allow the academic staff and students at King Abdulaziz University to create their personalized academic website. This service is characterized by a unique feature known as secure electronic communication which is established between student and academic staff. The system gives the academic staff an open space that can be used as an effective communication tool with students, where students can view the

uploaded lectures and assignments and important announcements, and where faculty can edit their website from anywhere at any time. MARZ is similar to a universal tool that provides a common service that serves faculty members and university students at the same time (Lee 1991).
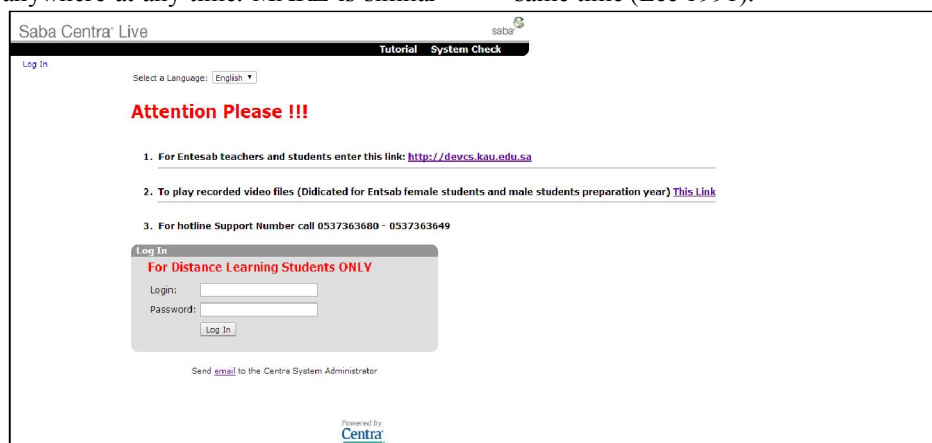

Fig. 1.2 CENTRA Login Page

Fig. 1.3 MARS Login Page

The final tool is a link up with the online library portal Academia.edu, which works with MARZ system to provide an open space for faculty members and students to upload and download data files related to studies, share study material, search for reference material and upload their own research work. Academia.edu is an online library portal used by many leading universities all over the world to share and store research work, and find reference material for research work (Academia.edu). The MARZ login can be used at Academia.edu user login to get access to all the research work uploaded and entitled for view and download on Academia.edu (Academia.edu).

3.3. Academic Information System tools Employed by King Saud University

King Saud University has a highly advanced Academic Information System, very similar to King Abdull-Aziz University's ODUS PLUS and MARZ system. There are several unique features packed in the bundle that can find great utility with students and faculty alike. There are separate demonstration panels available for visitors to the website, helping them to understand the various features in detail Following is a brief discussion of some of the notable features of King Saud University's Academic Information System.

Online Academic Portal is the part of the Academic Information System pertaining specifically for students and faculty members (King Khalid University). The portal lets students and faculty to access their user profile in the University databases, letting them check on current membership statuses, latest news, study and reference material, notice boards, announcements and declarations etc. The EduGate feature of the portal is a cross platform feature supporting multiple electronic platforms like iPhone and Android operating systems (King Khalid University), a feature very similar to the multi-platform features of King Abdulaziz University's Academic Information System. Madar is an ISO 9001 certified developmental ERP system project dedicated especially for the staff and students of King Saud

University (King Khalid University; EduGate). The system has administrative functions and helps employees to connect to the administration through e-mail client and upload information through statistical form data to the university data warehouse (Culnan 1987). The system works like a full-fledged online ERP system and has comprehensively added options that help with administrative functions.

Majales is a dedicated application for board based discussion forums (King Khalid University). It is a meeting place application used by members to interact with each other individually and in groups (EduGate). The system allows for file sharing in various formats and has categorized membership

usage. The system is meant for official meetings for the college and can be accessed through the unique identification and password provided by the Information Technology department. Tawasol is yet another application provided by King Saud University's online Academic Information System (King Saud University) (EduGate). It is a cross platform application meant for communication between students, student groups, faculty members and students. Still in its testing stages the application is available for hand held devices and requires user identity and login password provided by the university (EduGate). However, the system is still in its testing stages and gets updated from time to time.
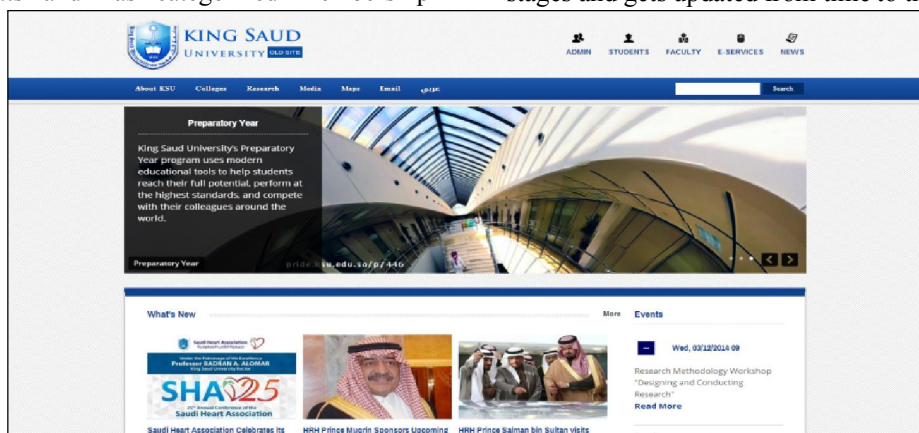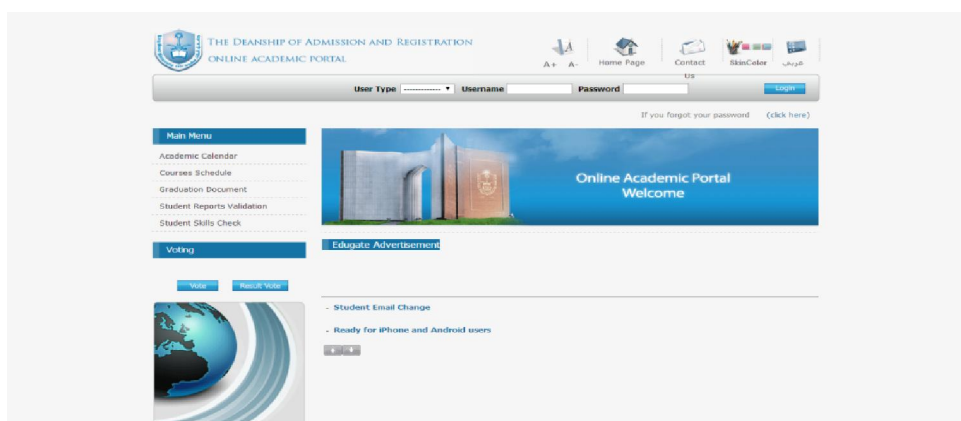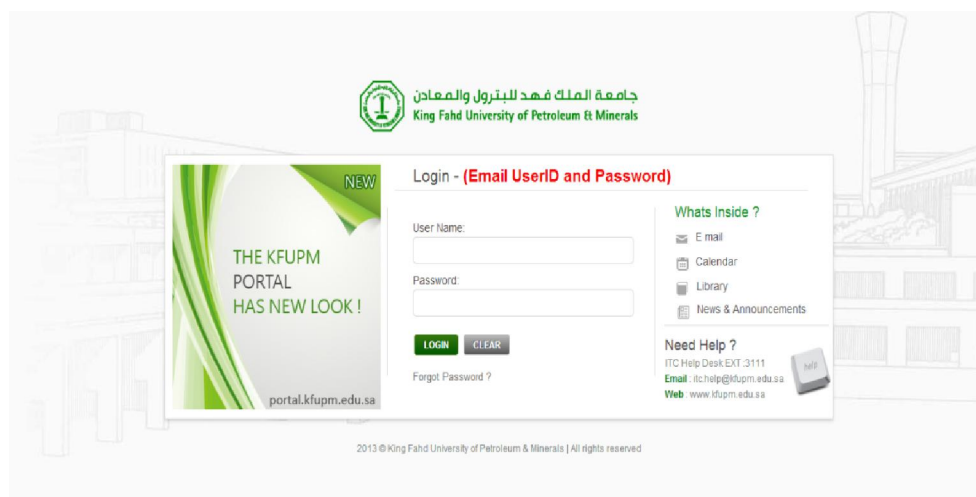

Fig. 1.4 King Saud Web page

Fig. 1.5 Online Academic Portal, King Saud University

3.4. Academic Information System tools Employed by King Fahd University of Petroleum and Minerals

The Academic Information System for this institution is very concise and carries only necessary tools related to academics. The login page of the portal features three service tools for students and staff. The login page is as in the following illustration. The portal features two login options, a

student login and a staff or faculty login. As the illustration suggests the login portal furnishes information regarding university emails, calendar events, the online library and news and announcements from the university. The system supports English and Arabic fonts and Umm Al-Qura University has a comparatively simple Academic Information System as compared to the highly sophisticated IS provided by KAU.
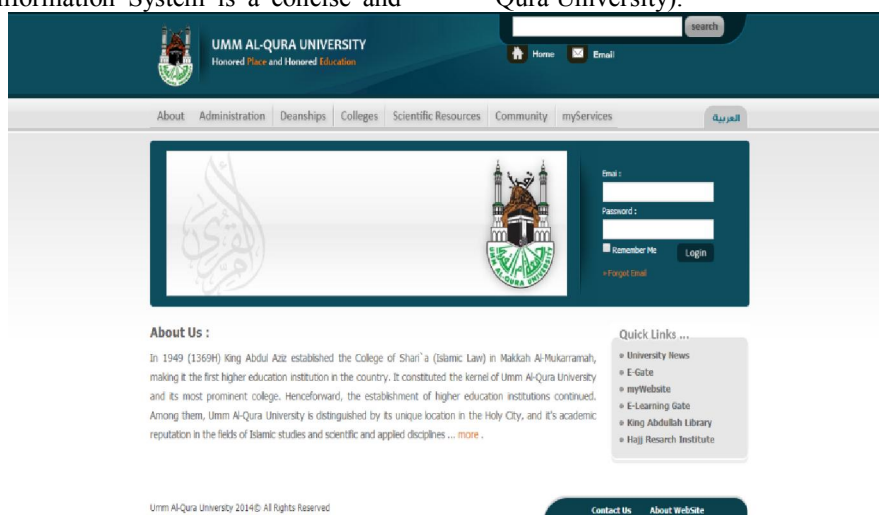
Fig. 1.6 King Fahd University of Petroleum & Minerals portal Login Page

3.5. Academic Information System tools Employed by Umm Al-Qura University

Umm Al-Qura University has a comparatively simple Academic Information System as compared to the highly sophisticated IS provided by KAU. However, the system is very secure and sophisticated in itself and consists of simple yet highly effective tools. Built over by Sure International Technology, the Academic Information System is a concise and simple solution to the needs of the university (Sure International Technologies). Although these tools may not work on cross platform technology, the data warehouse these tools connect the staff and students to, are very vast and contain state of the art information. Following is a description and analysis of the tools offered under the Umm Al-Qura University Academic Information System (Umm Al-Qura University).

Fig 1.7 About Page Umm Al-Qura University

The Academic Information System services include e-Gate, myWebsite, E-Learning Gate, King Abdullah Library and Hajj Research Institute link. These services are available to members of the university. All tools can be accessed through membership of the University. The e-Gate is a portal for students and faculty members to gain access to various request forums, electronic form filling, news, declarations and updates etc. The e-Gate is a simple tool used for access to various data warehousing options available with this Academic Information System and has only support for web browsers on several platforms, with no dedicated application for access.

MyWebsite is a profile portal that opens the unique profile assigned to each member of the university (Sure International Technologies). This profile is created during joining or recruitment with the University and can be accessed using unique user name and password provided by the Information

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technology Administration. This profile can be used to access and view information relevant to the specific field of interest of the user, declarations of the university, news, upcoming event, university policy updates etc. The service is available in Arabic and English only and can be used for university specific purposes only.

The E-Learning Gate is a distance education service tool incorporated for off campus students that features lessons and tests for students (Umm Al-Qura University). The service can be availed by students who are under exchange programs or are away from campus to keep record of the various activities that campus may offer academically. The service also helps faculty to post new assignments and get submissions from students when required. The King Abdullah Library is an online reference catalogue and library that offers coursework material, issuance of books and subscription track records of students and faculty of the university. The membership comes with privileges that allow students to access books from various libraries across the country's vast collection literature present in different libraries all over the country, making it an integrated vast library for both coursework as well as reference material. The library being the basic functional part of an Academic Information System service, the library tool in the IS service has a collection of all the online researches undertaken at KAU.

There are no specialized integrated interfaces for the students and faculty where they can post queries and interact with each other over research material. All research has to be carried out independently and

therefore much of the work is done through private counselling between students and teachers. Online forums do not exist on the Academic Information System servers although the University aims to setup such services in the near future. Since the Academic Information System service lacks multi-platform support and features only two languages, there is a scope for addition as well as improvement to the website as well the Information System services.

3.6 Academic Information System tools Employed by King Khalid University

The King Khalid University Academic Information System service has recently undergone a major revamp and now features integrated service tools for both student and faculty. This new revamping saw a faster and lighter web interface for the system and integration of many more services to the already existing system. These new services included new portals for students, faculty and administration with support for content in two languages that is English and Arabic. The portal carries several service tools which are listed as; email, excellence awards, my website, update user information, *Enjaz,* Academic Development System, Blackboard, Technical Support, Library and Research. The new web services have a modern approach and is expected to have support across platforms. The tools are comprehensively put together keeping in mind the needs of the faculty, students, administration and all the institutions as a whole. The most intriguing amongst these tools are the Academic Development System, the Blackboard, the Library and the Research.
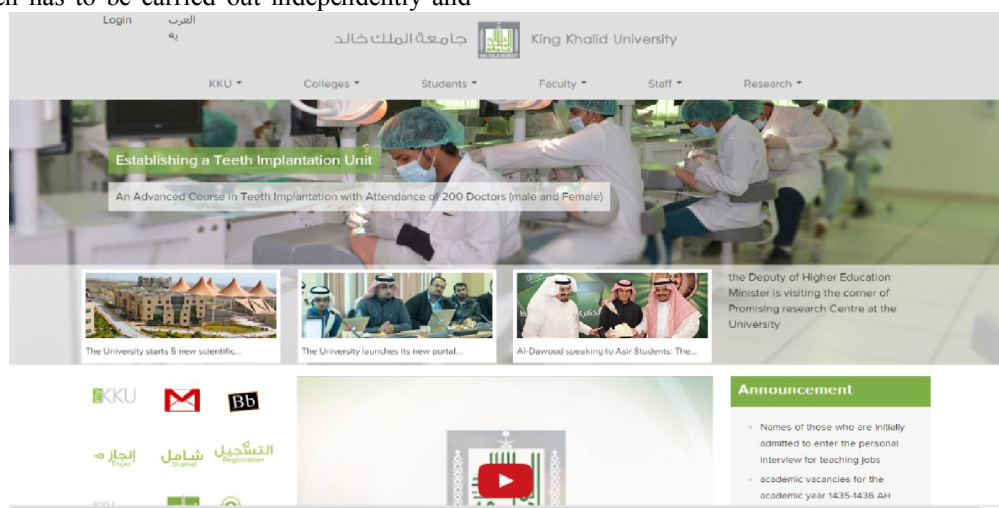

Fig. 1.8 King Khalid University Online Portal Login Page

The Academic Development System is a full-fledged system tool that can keep track of the total academic hours put by a student or record the performance of students under certain faculty,

allowing for performance measurement and evaluation (Hendrickson, et al., 1986), a feature present in the King Abdulaziz University Academic Information System under MARZ system tool. The system is used

as an interaction point between faculty members and students to get gist of the amount of academic development is required by the student to fulfil his or her candidature. The system is highly comprehensive and is accessible through the home page dashboard similar to KAU's MARZ and ODUS PLUS tools.

Blackboard is a virtual class system specially designed for off campus students attending courses at King Khalid University. The Blackboard is a virtual classroom providing options for video conferencing as well as assignment submission with tracking of total academic hours of each student spent on the system. The system carries all the advantages of interactive sessions between faculty and students and features forums for students to discuss their academic research with other off campus students. Interactive feature is also available for on campus students. Still in its testing version, the system promises good developmental and functional approach.

The Library is an online collection of books and reference material that can be used by students and faculty to go through the curriculum and coursework (Culnan 1987). The Library contains a catalogue of available books in the library and their availability in campus and associate libraries. Each library login carries the information regarding the number of books or reference material issued with due dates and track records (Gorry et al 1988,. The system is available on the go and can be accessed over the internet from any location all over the globe. The Research tool gives students and faculty an opportunity to work on various researches (Wilson et al 1986) going on in the King Khaled University campus, giving them a chance to work with globally note-able experts working with the University. The Research section also carries reference material for research aide and features options for students and faculty to post and share their individual researches (Culnan 1987).

The King Khaled University Academic Information System, though in its testing stages shows a good promise. Although it will take time for the University Information System to reach the sophistication level achieved by KAU's Academic Information System, there design is dynamic and can achieve it in a given short span of time, It is however yet to be seen if the university will recognise and incorporate cross platform compatibility in this system, including mobile devices for the convenience of all users, from faculty to students. After the detailed discussion and summary of specific salient features of all the Academic Information System services the discussion must now move on to a critical analysis of the tools provided by each of these Systems and their utility from the perspective of a user who can either be a student or a faculty member. The following section features a critical analysis of all the five Academic Information Systems in question.

4.   Critical Analysis Of The Academic Information System

Once a gist has been drawn of the Academic Information System available at all university campuses, one is enabled to draw parallels and differences between the working Academic Information Systems (Alter 2003) in the leading universities and the Systems being developed by other universities of Saudi Arabia. The Academic Information System, as mentioned earlier, is a service based for student, faculty and administration and therefore must have some common features (King Khalid University). When the word versatility is mentioned in terms of Academic Information Systems, a system's capability to adapt to different platforms, environments and situations is brought into question. The present day platforms include networked computers running standard operating systems, hand held devises running scaled down versions of major operating systems and mobile devices that can freely connect to the World Wide Web at any time (Bell 1983,). The more adaptable a system is the better its performance (Barnet, et al.,1988). Some of the Academic Information Systems summarized in the previous section exhibit these properties. They are secure and versatile. And yet there are some systems which have laid stress on carrying on single platform operability and strengthened their security over time.

In case of all the five universities under comparison, it is found that all the five universities carry a unique login and identification password for each user, a very necessary safety feature in the unstable and pilferage prone Internet system (Kock et al 2002,). Apart from this safety feature, all the Information System websites carry unique verification certificates that can assure the user of the authenticity of the website they are surfing on. However, with the advent of information technology into several parallel platforms and with more types of devices to access websites and login profiles now available in the market, the need of the hour was to develop systems that are able to adjust into different platforms and still remain stable and comprehensive for the user (Culnan 1987. Two of the universities in the analysis above were found to have cross-platform support with a third one testing its beta phase for its user base.

In terms of stability, King Abdulaziz University's cross platform multilingual Academic Information System is by far the best amongst all the Information Systems discussed. Although system has some problems, it is nearly perfect and carries all the features that can help it grow further and become an ideal Information System in the Academic Domain

(King Abdulaziz University). However, several problems encountered during the usage of service are that the system defaults itself to the parent language that is Arabic, every time a new page is accessed from the homepage of the website, causing users to lose time in searching for language change buttons on the navigation dashboard provided by the system. Apart from this there are no visitor profiles available for visitors to view or get a feel of the website completely. However, the system has a good feedback system available at all times with prompt answering centres that reply to email messages forwarded through the system in the next working business hour.

In comparison to KAU's Academic Information System, King Saud University has an interface that is compatible with multiple platforms too. However, the drawback of this interface is its availability in only two languages, English and Arabic. The default language of this system is Arabic and like KAU's website and applications, King Saud University's applications too change to Arabic pages completely when accessed (King Saud University). Apart from this similarity, KAU and King Saud University both provide multiple login options of student and faculty, but KING SAUD UNIVERSITY also offers a visitor option which lets outside users get limited but comprehensive information about the website and web services. This unique feature could be incorporated into the KAU Academic Information System at a larger level. Apart from this, KING SAUD UNIVERSITY's web format is simple and rigid and loses appeal when compared to KAU's dynamic web pages. Added to this fact that KAU employs separate service tools for staff web hosting, student file sharing and web communications, laying equal emphasis on all aspects at once. KING SAUD UNIVERSITY, however, has more cross-platform apps specially dedicated for communications and sharing, laying emphasis on the communication part of the Academic Information System service (King Abdulaziz University n.d.; EduGate).

In comparison with King Khalid University's novel Blackboard and other Academic Information System tools, CENTRA, ODUS PLUS and MARZ are well developed and frequently updated service tools. However, Blackboard and other tools are in their beta versions that are they are being tested for their utility and therefore have a lot of scope for addition of utility and improvement. However, King Khalid University's web services carry a similar feel to King Abdulaziz University's web site and web services. However, the new website being in its testing stages lacks the stability and features of KAU's Academic Information System web pages.

King Fahd University of Petroleum & Minerals portal is also very short and concise and has very basic functionalities in terms of Academic Information System services. The system has support for two languages English and Arabic and has secure surfing capability. The system is not cross platform in nature but can be viewed through mobile devices with limited functionality (King Fahd University of Petroleum & Minerals 2013). The server pages are written in HTML and XML scripts and therefore has in built security offered by both the scripts (Dostal 2007). The KAU web services lack in the security in comparison to KFUPM but more than make up in the plethora of services they provide to their user.

The Umm Al-Qura University has maintained with its old Academic Information System which is a highly specialized system dedicated for educational and religious information sharing for its students and faculty. The system does not carry highly specialized tools for information sharing but has a unique login identification and password feature, which supports student and staff level logins (Peay, et al., 1986). The administrative logins are unavailable on the public domain therefore making the site secure from remote siege (Wilson et al 1986). What the website earns over KAU's web service in its security, it loses it over its features and utility. The website does not have specialized services like KAU's ODUS PLUS or CENTRA and does not support cross platform functionality. However, the system carries a lot of information from its past experiences and is thoroughly updated regularly with new content. Also like the other two Academic Information System service providers, Umm Al-Qura University's Information System also supports only English and Arabic languages.

In terms of technical speculation, King Abdulaziz University's Information System runs on servers based on server mirrors present in United States of America and the website has been written in ASP, making its cross functioning and dynamic approach much more powerful and error free. The King Khaled University's Information System is also being developed in ASP and PHP scripts and will be mirrored through similar servers, and being in its testing phases, the service phases some security issues. King Saud University and Umm Al-Qura University Information Systems are well established services and therefore are very secure, however, Umm Al-Qura University lacks the efficient throughput required for today's fast paced internet surfing as it is written in simple HTML script. Also, King Saud University has more built in functionality in terms of communication and sharing, however it loses on linguistic approach.

King Abdulaziz University's web services are unavailable on Yahoo! servers, however, these webpages rank well on Google reviews and can be a

good measure to understand the security and utility of the website. With more than 9,000 views per day in Saudi Arabia only, King Abdulaziz University Information System website is fairly popular, with its download-able application hitting more than the 40,000 mark on Google Play Stores. Much of these analytic are missing for King Khaled University and Umm Al-Qura University's Information Systems online.

However, King Abdulaziz University and King Saud University Information Systems have analytics listed in Google and other analytical websites and rank high in popularity in the middle-eastern region, especially Saudi Arabia. Using the above comparison, the following data table has been drafted (Broering 1986). (Please note that this table is based upon personal inferences drawn from website checks based upon online website checkers). Based upon the stars earned by each of the Academic Information System Services, the best amongst the five Systems currently is the King Abdulaziz University's Information System. However, all the Information Systems have the potential to grow into powerful systems that can provide information to students and faculty members.

Table 1.1 Facilities of AIS in various Saudi Universities

Name of Institute	Flexibility/Platform Compatibility	Utility	Security	Languages Supported
King Abdulaziz University, Saudi Arabia	****	****	***1/2	4
King Saud University, Saudi Arabia	****	*****	***	2
King Khalid University, Saudi Arabia	***	****	**	2
King Fahd University of Petroleum & Minerals portal	***	****	***	2
Umm Al-Qura University, Saudi Arabia	**	***	****	2

There are certain points of similarities between all these Academic Information System services. One feature that is found missing almost all of these websites is the lack of secure web surfing, although security certificates are filed for all of these websites, a support for secure web access is a must in today's internet with high risk networking and high instances of data pilferage (Dostal 2007). Another feature that needs a mention is the availability of Enjaz links throughout the website of all of these institutions (Ottaway 2012). Enjaz forms, as discussed earlier are a necessary step to apply for a VISA to the Kingdom of Saudi Arabia. This feature is added to all the Information System services of all the University portals giving them a chance to acquire data related to an individual wishing to visit the University for education or for employment.

The websites also provides news updates about the regular upgrades of data acquisition and system tools to allow better functionality to the system and keep the users informed of the new features being incorporated. With a scope of development and efforts, a system can become functionally more powerful and efficient and universities strive to make their Information Systems more powerful. These periodic updates and their announcements by administrative authorities depicts that they recognize that changing technology requires upgrades, and with advent of IT industry in the present times it has become absolutely necessary to gather reliable information with better warehousing facilities and processing capabilities. All of these services can lead to the conclusion that the information furnished or accepted in the web pages or through physical means are an intellectual property of the institution itself and legal bindings are levied to on the member users of the services. Working on this project has given an insight into what an Academic Information System service works and how it has a huge impact on the educational society.

5.   Conclusion and Recommendations

The universities in Saudi Arabia are engaged in a healthy competition to become a better educational institute and improve the quality of education in their region. The Kingdom of Saudi Arabia is a progressive state and has resources and a rich culture that can percolate into the academic system and enrich many lives. Based upon the principle of digitisation, unification, reaching out and becoming ecologically and economically correct (Ottaway 2012), every institution must begin to consider converting their work into a system that can accommodate a digital service scenario (Hayes and Sharma 2003; Hayes 1983). With the development of secure technologies, Information System services are bound to become the best choice for almost every kind of institutional activity. Academics depend heavily upon data collection and record keeping, and therefore, Academic Information Systems are a must for every academic institute that wishes to attain global acclaim (Hayes 1983). However, it takes time to implement a system that can work according to the goals set by the institution (Kock et al 2002). Developing such a system which is versatile and can carry out processes according to the needs of the user as well as the institution is a must (Lucier et al 1988).

In terms of cross platform functionality, security, usability and quality, the Academic Information System designed and deployed by King Abdulaziz University is one of the best one's in the world. The quality of the service can be compared to any leading university from the Western world. There are many technological innovations involved in the development of such high end systems. It is, indeed, a technical marvel to achieve such fluid like utility with the help of indigenously developed service tools (Kock et al 2002). Other universities based in Saudi Arabia have also developed their own Academic Information System services like the service deployed by King Saud University, King Khalid University or the Umm Al-Qura University. Some of these Academic Information Systems are fairly advanced and show scope of development, growth and improvement. However, when compared, the Information System developed and provided by King Abdulaziz University is one of its kind.

The King Abdulaziz University Academic Information System is a reliable "Information System" available over several platforms, from Windows based computers to Android Operating System base hand held devices. The King Saud University also features a cross platform approach. However the emphasis of this system lies more in the communication function and several communication based applications exist for the system (Johnson 1983). Other Academic Information Systems like the ones available at King Khalid University or Umm Al-Qura University are fairly simple and support only conventional electronic platforms for viewing. Secondly, The King Abdulaziz University Academic Information System is available in four different languages English, Arabic, Spanish and French, although major communication occurs over two of these languages Arabic and English, and is therefore suited for working at a global level. The other Information Systems are available only in two languages, Arabic and English, and are more suited to operate at comparatively local level. Although comparatively modern, King Fahd University of Petroleum & Minerals portal and King Khalid University's Academic Information System are still in testing mode and will require a lot of performance improvements to reach King Abdulaziz University or King Saud University's Academic Information System levels. However, in comparison to Umm Al-Qura University's Academic Information System services, King Khaled University's Information System has a much better interface and translational capability (King Khalid University; EduGate).

Apart from these differences, the major difference comes with the integration of online virtual classes in the King Abdulaziz University Academic Information System, along with services like MARZ

that allow web hosting and online space sharing for faculty and students at the same time. Such services are absent from the Academic Information System at the other two universities. The services are also more secure with King Abdulaziz University's dedicated overseas servers running the service on their platforms making service availability possible round the clock and data transfers fast and secure. However, King Abdulaziz University can work more in bringing more translational clarity and allow full page translations all the supported languages. Currently the services are run based on host servers located overseas (Lorenzi 1983, Lorenzi and Marks 1988). However, in the future, King Abdulaziz University can seek to set up its own server for data warehousing while continuing the use of overseas servers for redirection of traffic for safer data handling and reliability.

On a scale of comparison, when critically analysing all the five Academic Information Systems, King Abdulaziz University's highly specialized and technologically coherent system ranks the best amongst the five systems, followed by King Saud University and then the King Khalid University's revamped Information System. Although the systems are comparatively new and have a lot of scope for addition and improvement, it is very encouraging to find that such innovations are being carried out by national level institutions, raising the standards of quality of education to newer levels. There is only hope in change and improvement. But in the current scenario the Academic Information System for King Abdulaziz University ranks amongst the topmost Information Services amongst all the listed institutions in terms of security, reliability, user friendliness, tools and reference services.

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