ALALSHEKMBARAK, Abdulrahman (Supervisor Jenny Coady)

E-Government in Saudi Arabia

The purpose of this study was to evaluate the Saudi e-government programme, namely Yesser, and determine the level of Saudi society readiness in adopting e-government. Two questionnaires were used in this study to measure users' satisfaction rates of Yesser and the readiness level of Saudi society. The annual progress report of Yesser and its action plan documents were also used to evaluate Yesser. In addition, this researcher compared Yesser with two neighborhood e-government programmes, specifically eDubai and eOman.

The findings of this study suggest a serious issue that faces implementing Yesser. These findings also suggest that it is very unlikely to achieve Yesser objective without making significant changes to the action plan. The result of the comparison among the stated e-government programmes indicates that Yesser progress is average compared to the other selected government programmes. The Saudi society readiness of adopting e-government seems to be considerably low to the extent that may not allow Yesser to accomplish its objectives.
ALFAYEZ, Fayez (Supervisor Dr Lilia Georgieva)

**Impact, Adoption, and Barriers** (In the Kingdom of Saudi Arabia)

Ecommerce as changed the face of commercial transaction globally. Today it is easy to make payment for flight tickets and also pay money into an account of a friend who is miles away from you.

This dissertation examines ecommerce in the Kingdom of Saudi Arabia using the case study of online banking and online stock trading. Various literatures on ecommerce have been reviewed in order to gain background knowledge of the ecommerce sector in the country.

The dissertation will use a survey method involving quantitative data analysis. The data are obtained via questionnaires sent to various customers of ebanking and online trading in the Kingdom of Saudi Arabia. Additionally, a variety of people in the Kingdom of Saudi Arabia who use ecommerce in any form will also be sent questionnaires.

The security issues as it affects ecommerce generally are examined with a view to finding lasting solutions. Meanwhile, any barriers or obstacles in adopting ecommerce in developing country will be defined. This dissertation also has examined which barriers are affecting the adoption of ecommerce in the Kingdom of Saudi Arabia.

A survey has been handled in Saudi Arabia this followed by presenting the data collected which focused on personal use of ecommerce, personal use of ecommerce, quality and skills, barriers and obstacles, benefits of ecommerce, and the utilisation of ecommerce. After this the data has been analysed.

Finally, recommendation to develop ecommerce usage in the Kingdom of Saudi Arabia has been made with a suggestion for further researches.
ALOSTA, Alhemali (Supervisor Dr Hamish Taylor)

Visual Password Authentication

Today it is generally accepted that a key factor for the future will be communication. Each person will be able to obtain large amounts of data without assistance. However, the world of networked computing can be a scary and dangerous place with attackers, hackers, and crackers at work. Computer security, which should to be relatively simple and safe for users, is now a most important and expensive problem for work and individuals. Recently there have been a lot of requests for passwords for example we use passwords for opening email boxes, withdrawing money from an ATM, accessing webbased email accounts, getting into an Intranet, or logging in to some web sites. To be useful passwords should be easy to remember and users should be able to authenticate themselves quickly. A password is a word or string of some characters that is used for authentication, to prove identity or access to a resource. [1] Moreover., many people record passwords on pieces of paper or write them into files to ensure they don’t forget them. This makes passwords easier to discover by an unauthorized person. Hard to guess passwords are also harder to remember. Therefore and for that reason we have to search and explore for alternative easy ways to authenticate ourselves. Graphical passwords may be a solution to the password problem.

Graphical passwords use pictures or pictorial elements in place of password letters.

This research background is intended to give an overview of graphical passwords as an alternative easy way to authenticate ourselves, and focuses on the advantages and disadvantages of graphical and text passwords.
ALMANSOUR, Mohammed (Supervisor Dr Hamish Taylor)

Visual Password Authentication

Think for a moment of daily tasks. Many require passwords. These include a company’s computers, home computers, ATMs, web sites, voice mail, and security systems in the car and home. It is difficult for humans to remember traditional passwords that consist of letters and numbers. Unfortunately, laziness plays a big role in most people’s choice of textual passwords. Most people facilitate dealing with passwords by saving them on small pieces of paper or in files or by using a common password for all systems and accounts. Such methods make it easier for hackers to invade computer user’s privacy. The problem of forgetting passwords is a widespread problem. Researchers are moving towards what could be a solution to the problem of remembering passwords by using graphical passwords instead. Such passwords authenticate users by using pictures instead of letters and numbers. Graphical passwords are being looked at by a number of companies, including Microsoft, as one of many ways to solve the problem of forgotten passwords. In contrast to numbers and letters, we find it easy to remember images. Therefore, maybe a graphical password might be easier for users to remember and more difficult for others to hack.

In this project, existing graphical password techniques are explored and the strengths and limitations of each technique are discussed. A visual password authentication system that guides on these strengths was designed, implemented and evaluated and report describes this in detail.
Investigation on Web Content Management System Software: Comparison between Drupal6.10 and Joomla!1.5.10

Web content management system software (WCMSS) is a new written program that has been produced during the last few years in order to be an alternative for technical specialists to allow others who do not have deep computer knowledge to manage their websites. Many companies are using web content management system software now to manage their websites. Some organizations and people do not hear or know about this new software. Thus, the aim of this paper is to investigate on the web content management systems (WCMS) and simplify how the system works to give a clear idea to the reader about WCMS. This paper has historical information about the web and the difference between static and dynamic websites. It has also an explanation of the content management system (CMS), web content management system (WCMS), and web content management system software (WCMSS). The author explains in details the three parts of content management system: collection, management, and publishing. The paper includes more information about the security issue in WCMS and how to select CMS software. This paper has an evaluation of two of popular WCMSS which are Joomla!1.5.10 and Drupal6.10; this evaluation has been divided into two parts: the analyst’s evaluation and the users’ evaluation. The author is comparing between the two WCMS products from point of view of a programmer in the first part of the evaluation. Finally, the paper has a usability test that has been done by users in the second part of the evaluation to see how easy is to use a WCMSS by first-time-users.
Knowledge Management (KM) assists in capturing and extending the valuable knowledge of individuals across organizations with methods that directly affect an organization's performance. Knowledge Management aims at identifying, creating, organizing, sharing, acquiring and creating new knowledge for organizations. Each organization has a unique culture, as well as circumstances that effect the implementation of KM. Yet, a number of factors are required to ensure the success of these programs. Technology in KM plays an important role in most of its activities. However, technology is conceptualized as being a small part of implementing KM projects in organizations, and other factors should be considered (e.g., the organizational culture and top management support).

In this research, I am concerned with the knowledge management systems (KMS) and technologies that are used to ensure successful implementation of KM, and how they can be developed to meet all of the KM activities.

This study is an exploratory investigation of the role of knowledge management systems in developing organizations and the use of Information technology tools in Knowledge Management. I had to explore all KM aspects in order to obtain additional information for my further research. My primary recourse is a qualitative approach that included interviews with five private Saudi organizations that is currently employ KM programs within its context. The interviews were conducted in order to look at the existing barriers and difficulties encountered by implementing knowledge management systems, best practices and the critical success factors that enable their success. The secondary methodology is a literature review that included the key others of KM and their inputs in the KM filed.

**Keywords:** Knowledge Management System, Information Technology, Saudi Arabia
AQEEl, Ibrahim (Supervisor Dr PierLuigi Frisco)

NETWORK WITH SPECIFIC MOTIFS

The field of systems biology and network motifs has rapidly emerged as a major research area in recent times. In all these networks, there are repeating patterns known as Network Motifs which occur at random intervals. The study of these motifs plays an important role in the understanding of complex biological networks and their functions. The aim of this paper is to study the theory behind the formation of network motifs in complex networks. This can be done by simulating the creation of these motifs in real time with the help of a software program. In this research, a program developed in Java is used to simulate the creation of network motifs. This program creates virtual undirected networks with specific motif makeup depending upon certain input parameters. When the input parameters are changed, the program responds accordingly and the resultant network structure, size, number of motifs etc also change. This research aims to study the variations in the network motif creation with the help of this simulation program by conducting several test runs on it, each with a set of different input parameters. The test runs will be conducted on Windows and Linux operating systems. The resultant data related to network motifs will be recorded and analyzed to arrive at various observations regarding the formation of network motifs. By doing so, the research aims to provide insights into the subject of recurring network motifs in biological networks.
COVALCIC, Ioan (Supervisor Monica Farrow)

Courseware to Support the Teaching of SQL to High School Pupils

This document outlines my MSc Dissertation, the purpose of which is the design of an eLearning courseware for the teaching of the basics of SQL to high school pupils. Given the gap in literature as regards design decisions for such a system, as well as no former eLearning software for the teaching of SQL in high schools to use as subject of investigation, this paper provides step-by-step explanations about how the system was developed and how it was validated with users. After outlining the way requirements were captured and describing them, as well as the derived use-cases, the paper motivates design decisions and presents the main functionality of the courseware by means of class, sequence and entity relationship diagrams. The implementation is described by means of screen shots and detailed explanations of functionality. At the end, and evaluation with high school pupils is used to reveal whether the project was successful and what further work is needed.
The Psychology of Security in E-commerce

Security has always been an issue for human beings and in the recent decades that technology has developed, the number of security issues have also been growing. In this dissertation, the psychology of security in ecommerce is investigated which has required explaining each of the aspects of this topic separately. The subject of Security and privacy has been explained and then they have been discussed in the context of psychology and ecommerce and finally the relation between them all has been illustrated.

This has required going through individuals decision making processes different theories, making sense of the perception of security and the risk heuristics that have impacts on our decisions and also from the other side the usability and psychology which discovers and experiments the attacks that are based on psychology and how psychology research discusses all these related issues.

A survey has been carried out for the means of this dissertation which a random population of 35 individuals were asked to answer to questions related to the dissertation.

Results of a survey carried out through the project have demonstrated interesting information about what individual’s think of the security and privacy that they have through ecommerce in the recent situations.
ESHAFTRI, Mohamed (Supervisor Brian Palmer)

CREATING A GRAPHICAL GAZETTEER

This dissertation, entitled "Creating a Graphical Gazetteer", is the result of the author's work on facilitating the sharing of user's information using web-based applications. The study is essentially two-fold: the first part is theoretical in nature and includes a detailed review of the literature on the subject of web-based applications. It then summarizes the techniques and methods that are often used to create web map applications, and proposes some new insights into the subject. The second part describes in detail the process of developing an exemplary web-based application that can be demonstrated in practice.

The structure of this document is as follows: the first chapter presents an outline of the main objectives and expected outcomes of this work. Then, the subjects of web-based applications and the targets for creating a Graphical Gazetteer are discussed in order to give the reader the appropriate context. The second chapter presents a Literature Review concerning web-based applications. Chapters Three and Four explore various techniques and methodologies commonly used for designing software systems and efficiently organizing the development process, outlining in detail the final design of the system that this work centres upon. Chapter Five details the methodologies used for testing whether the behaviour of the system meets the desired outcomes, and contributes a user-driven evaluation of the software by means of a survey conducted among students of the university.

Finally, Chapter Six describes the author's own evaluation of the whole process of developing this web-based application. It shows that the main goals were essentially met, and is characterized by extensibility for possible future feature additions. This chapter is rounded off with the sharing of several thoughts on the possibilities of extending the system, and on implementing new features that the author finds lacking in most web-based applications on the market.
Comparing Chatbots with Task-driven Dialogue Systems

Chatbots and spoken dialogue systems are both interaction systems that make a conversation between the user and computer in intelligent way. This paper will cover a literature review of both systems. First, chatbots and their properties throughout the developing stages are covered and then the existing chatbot systems are discussed. Secondly, spoken dialogue systems are covered regarding their structure. Finally, the usability of both systems is assessed. In this theses, chatbot and spoken dialogue systems have been used for the same purpose which is a restaurants guide that gives people the opportunity to obtain various details of the restaurants in Scotland. The reason behind making both systems is to compare both of them and at the end we can see the advantages and disadvantages of each system. This paper assesses user satisfaction. In other words, both systems are created for the same reason and then participants use them and give us the results.
LIU, Jun (Supervisor: Dr Pierluigi Frisco)

The Billing System

The project aims to develop a billing system, a three-tier architecture, which supports the client side and server side exchanging packets via simulated GPRS connection. The client side sends packets to the server in order to start or stop a certain service, while the server side sends packets back to the client side showing the current service status in response. The server will automatically calculate all the charges of the services rendered and bill each client by email at the end of each month. This project is a commercial idea that not yet patented. It is related to a contract been made between Heriot-Watt University and an external business organization. Thus, the author has a limited access to the details of the project, which he doesn’t know about, for instance, the application of the system, the service that the system renders, etc.
Analysis of the Business-to-Business Integration Lifecycle from a Sociotechnical Perspective

Analysis of the Business-to-Business Integration Lifecycle from a Sociotechnical Perspective Business-to-Business (B2B) integrations are complex projects that need to consider sociotechnical issues. The research area in inter-organisational information system integration is vast and IT solutions to help such integrations are numerous. However, number of B2B integration projects fail, and mainly because of social or managerial aspects. Companies facing such projects need guidance to successfully integrate their systems. In this paper, a sociotechnical framework is proposed to provide guidance for such integration projects. The framework covers the entire B2B integration lifecycle from a sociotechnical perspective, and ties-up various concepts and methods used in such complex integration. Business process management techniques and service oriented architecture are presented to provide flexible systems. Model-driven and enterprise architecture are suggested to model the entire organisation. Business process and organisational re-design techniques, and process improvement models are proposed to implement changes in an incremental and integrate manner. The contribution and limitations of this framework are discussed in order to identify potential opportunities for further research.
POLLOCK, Adam (Supervisor Dr Andrew Ireland)

An Investigation into Content Management Systems

Since the term ‘content management’ is so ambiguous, a common definition and understanding for ‘content management systems’ is equally hard to find. These definitions tend to fall into two distinct views of what constitutes a content management system (CMS). One view is that a CMS is an application for managing, publishing, and modifying website content, whereas the other view defines a CMS as a more general system to facilitate the management, editing and modification of any documents or content.

With continuing growth of the internet and technology, the volume of data an organisation has, maintains, and wants to show increases exponentially. This presents several problems and issues that can all be solved with the successful implementation of a CMS. As a result, the CMS market and corresponding technologies continue to grow and evolve.

The process of selecting a suitable CMS is also still in constant development. There are no set methods used for eliciting requirements, and instead techniques tend to be adopted from other domains such as general requirements engineering. There is also a distinct lack of a recognised CMS evaluation framework, which leads many organisations into choosing unsuitable systems. The failure rate of a CMS is relatively high and so this is an area that still needs a lot of progression.

Therefore the construction of a possible reusable CMS evaluation framework (‘the framework’) would be a highly beneficial exercise. Using the investigated and reviewed literature as a guide, a possible framework was created through the course of the project. The example domain used for this investigation was the Dependable Systems Group (DSG) web pages. This provided justification and an example implementation of the constructed CMS evaluation framework. Despite having some obvious flaws, the example implementation of the framework was successful in choosing a suitable CMS for the DSG; and provides a good starting point for further research into a possible CMS evaluation framework.
SADRZADEH, Bahar (Supervisor Dr Roger Rist)

REPURPOSING OPEN LEARNING MATERIAL

The Internet can be thought as one of the most life changing inventions in 20th century. Reusing and repurposing is one of the significant ways for accessing and developing of learning material. Repurposing of learning material has been used for a long time, but still there are many organisations and universities which are not aware of its great impact on improving learning for their learners.

The aim of this research project is to explore the area of “Repurposing open learning material”. It also aims to look at how repurposing has already been used in academic environment and online learning material, how effective they are and how they have changed the face of learning in recent years. This project also looks at how repurposing brings advantages to organisations and institutes. For reaching this aim, open learning material will be used which is a great source of education for people with different learning needs.

This work will hopefully result in an improved awareness of using repurposed material and will lead to greater use of it in learning institutes and organisations by learners and people who are involved in different academic areas. There are many online institutes and universities which provide this kind of learning, but there are no many people who know about it. This work will hopefully help in better understanding of the material and also an encouragement to investigate in this field.
Repurposing Open Learning Resources

The production of high quality learning material is a very cost effective and time consuming process. Therefore a lot of research has been carried to find out ways of using customizable learning objects that could be reused and repurposed in different scenarios. This process is known as Repurposing and it has unlocked wider opportunities for learners as well as for educators. It has introduced new pedagogical approaches, by reutilizing the reusable material into different ways and customizing the content according to its audience. Repurposing facilitates in enhancing the design and interactivity of the learning material. Since it is a time consuming process to develop learning material from scratch, repurposing made it feasible to share and reuse learning material, as the production of learning resources is expensive task. Therefore repurposing plays a significant role while developing e-learning content. Many educational standards and organizations have already integrated e-learning into their portfolio to deliver online courses and training by adopting repurposing approach to save their time and cost. With the changing trends in education system developing an effective learning material is imperative for every organization in order to make learning more interactive and engaging. Hence it is beneficial for academic institutions to develop learning material that can be reused and repurposed and can fit into different context. But there are several obstacles that impede the progression of repurposing approach. This investigation addresses the following question: “How successfully reutilization of resources can be done by taking advantage of online repositories and thus improving the quality and effectiveness of the content”?

The aim of this investigation is to highlight the advantages of this approach and to demonstrate how easily it could be carried out. The project would endeavor to broadly explore this area to find out the challenges involved in this process and extract the ways to solving this dilemma.
Investigation of Practical Applications of DO178B in software requirements

Software requirement plays decisive role in software’s success or failure. So to derive the project’s success in all dimensions it is necessary to analyse the requirements precisely during the system development phases. For that, there are many approaches to deal with this problem but how far they are effective is still a question. In this research, we have attempted to make the requirement gathering and analysis as comprehensive as possible by investigating various applications of DO178B standard and by selecting industry’s best requirement analysis practices, and integrating them in a requirement analysis framework. This framework describes each and every requirement analysis stage in detail and explains activities like investigating requirements from high-level to low-levels in a more structured way in order to deliver maximum benefits. With the help of such activities we try to perform flawless requirement analysis which is absolutely error free and solves the problem of project failures caused by requirements.

In addition to this, we have identified some crucial elements of DO178B standard which can fit in any type of requirement analysis approach and can help in producing exceptional results. As DO178B leverage the software development standard, it has a lot to give to software industry and this document tries to extract those applications which can be applied to normal software development processes.
information Systems Strategy in relation to Business Strategy development in the Education Sector

Information Systems (IS) play a crucial role nowadays to all the organizations. The education sector usually follows the development takes place in all fields, and of course in the technology as well. IS strategies that universities follow do not ensure success to them. A lot of IS strategies fail because they do not have the appropriate guidance, the ideal management, the right usage of them while also they do not have the appropriate alignment with the Business strategies. IS strategies can provide very essential profits to an education institution by the required proper handling; otherwise the failure is not far away. That does not mean that the success of an institution depends only on its IS strategy but because the balance between the IS strategy and the Business strategy is very sensitive, the failure and the success are very close.

This study is an examining investigation of the role of IS in developing organizations (higher educational institutions in our case). It will also contain a comparative study of British and Greek universities, which aims of investigating the way of thinking for the alignment of the two strategies the universities’ staff in these two different countries. A comparative study that investigates the different way of thinking between IT and Business decision makers for the same issue is provided while finally the key factors that promote or not the alignment between IS and Business strategy will be presented.
ZHAO, Yang (Supervisor Dr Pierluigi Frisco)

A New model of Network

A network can model several things: computer, people, cells, etc. A good network model is very useful and can help propel society forward. When a new network model is discovered, a new industry that is connected to that network model will quickly develop. For example after the scale-free network model was discovered the computer networks quickly grew.

It has been found that many natural networks share common properties, such as scale freeness. In a social society, it is possible both for some people to have many friends and others to have few friends. It is a challenge creating a computer program able to generate a network with such features.

In this report, attempts are made to build a new type of network with the features discussed in above. This is a new model of network, never seen before. So it is impossible to gather any experience from other people. This new network model has some characters in common with Barabasi-Albert model: growth. It also has some distant characteristics, which are different from other network models: such as, every node in the network has a description, and the method to generate edge between any two nodes is according to distance. For each time step when a new node was added in network, the number of edges generated from the new node is not fixed, but it should bigger the 0. Therefore it is possible for some nodes to have huge numbers of edges, and some nodes have a few edges.

In the last, it showed the changes with number of symbols in node description changes. That is what variable description means. It also tried to explain why the network changes with the different parameters changed. It also should continue thinking why networks changed without expected.