

Auto Notification Service for the Student Record Retrieval System Using Electronic Mail Message (EMM)

Ibrahim A.S.Muhamadi, A.A Zaidan, S.Raviraja, M.A Zaidan, B.B Zaidan, Chengetai Mapundu

Faculty of Computer Science & Information Technology

University Of Malaya

Kuala Lumpur, Malaysia

Abstract

Web development in becoming a global knowledge has taken numerous steps to improve its information systems, strengthen internally and externally focused knowledge-sharing activities, and foster broader global knowledge-sharing initiatives, all in support of enhancing the web development and its partners' and clients' access to and sharing of ideas. Most of universities have websites; these websites have links which its content of information of a student such as examination results which is not sufficient to show or provide all the data required. The Student Record Retrieval System (SRRS) has been introduced to overcome the above mentioned problem. In this paper, a new proposed system enhancement to the role of the lecturer in SRRS is presented so as to be more informative to the student. The enhancement to the system aimed to allow the lecturer to pass more information to the student using auto notification of electronic email message by depends on email address for each student.

Keyword:

Student Record Retrieval System (SRRS), Electronic Email message (EMM).

1. Introduction

With the rapid growth of the Internet, organizations are constantly finding new ways to leverage this technology as a means of achieving their objectives. These objectives vary and can include enhancing client relationships, promoting customer loyalty, streamlining internal communication and many other endeavors. Although the goals may differ, the Internet has become one of the most essential components of an organization's communication strategy [1]. The Electronic mail, sometimes called email, is a computer based method of sending messages from one computer user to another. These messages usually consist of individual pieces of text which you can send to another computer user even if the other user is not logged in (i.e. using the computer) at the time you send your message. The message can then be read at a later time. This procedure is analogous to sending and receiving a letter. Originally, email messages were restricted to simple text, but now many systems can handle more

complicated formats, such as graphics and word processed documents [2]. When mail is received on a computer system, it is usually stored in an electronic mailbox for the recipient to read later. Electronic mailboxes are usually special files on a computer which can be accessed using various commands. Each user normally has their individual mailbox [1][2]. It is straight forward to send electronic mail between users of different computer systems which are connected to major networks. Most major academic and research institutions and companies throughout the world can now be reached by electronic mail. In addition, a growing number of individuals can be contacted in this way. In the UK, most academic and research institutions are linked by a network called JANET (or Super JANET). This is effectively part of the Internet, so email can be exchanged with most national and international networks [2]. The World Wide Web has long been considered the focal point of a successful Internet strategy. Organizations are, however, increasingly recognizing the necessity of electronic communication to efficiently reach their goals. The ability to interact and communicate with different audiences - such as customers, employees, partners and suppliers - via email, quickly and easily, is now just as vital for an organization's success. This is where email lists come in. Email lists are a very successful tool for achieving a variety of objectives. Email lists enable fast, global and economical group communication. By using email lists, organizations can quickly deliver large numbers of email messages for a fraction of the cost that other communication channels require [1],[2]. This introductory white paper discusses email lists and how to effectively use them to further your organization's goals. It explains what email lists are, how different types of email lists are set up, and most importantly, how to effectively use them and make them work for your organization. The operating principle behind email is relatively simple, which has quickly made it the most popular service used on the Internet. As with a traditional postal service, for your message to reach your recipient, all you need to know is their address. Its two

main advantages over "paper mail" are the speed at which the email is sent (practically instantaneous) and the lower cost (included with the cost of an Internet connection). What's more, email can be used to instantaneously send a message to several people at once [1][2].

A. Email Facilities

All email systems have the ability to send, receive and discard mail. Most systems have facilities for storing mail which is to be kept rather than discarded. It is important to discard mail which does not need to be kept, as it uses storage space on disks. Mailboxes can soon accumulate a large number of mail messages making it difficult to read and process new mail, in addition to wasting disk space. There is almost always a connection between the email system and the computer's standard file system which allows mail to be read from files or written to files. This enables greater flexibility in how the mail system is used. For example, a mail message may be prepared in a normal file using a familiar text editor and then sent by the email system. Sections of other files may be included in the mail message as well. Most systems have a reply facility, although some of these do not always work as expected. Care should be taken when using this facility in electronic mail, as replies do not always go back to the sender. The recipient of mail may not always be an individual, but could be a service such as Helpdesk, Postmaster, a mailing list or an automatic processing service. Mailing lists are supported by many systems. These allow mail which is sent to the name of the list to be sent automatically to all addresses in that list. In this way mail can be sent to one or more groups of users who share a common interest, e.g. members of a user group or research team, by sending a single message. A number of information services are also available through electronic mail whereby the mail is processed and answered by an automatic process on the remote system [2].

B. Understanding how e-mail gets around the Internet

i. E-mail Structure

Every e-mail message has 2 parts: a header and a body. The message's header specifies control information such as its source and destination; the time it was mailed, and the person that created the message. The message's body contains the content of the message which might be plain text, or MIME (Multipurpose Internet Mail Extensions). MIME allows a sender's mail server to encode 8-bit binary files using a mail system that supports only plain text. A MIME-enabled mail server encodes binary data as text and then the recipient's mail server decodes the text back to binary file [1][2].

ii. Concept of E-mail

SMTP (Simple Mail Transfer Protocol) is a standard protocol which is used to transport e-mail. Actually, there are some mail agents handle all the networking required to move mails around a network and they run as a background process. However, when you are using a PPP connection to the internet, your internet mail computer uses SMTP to deliver mail and POP3 (Post Office Protocol version 3) to receive mail [1][2].

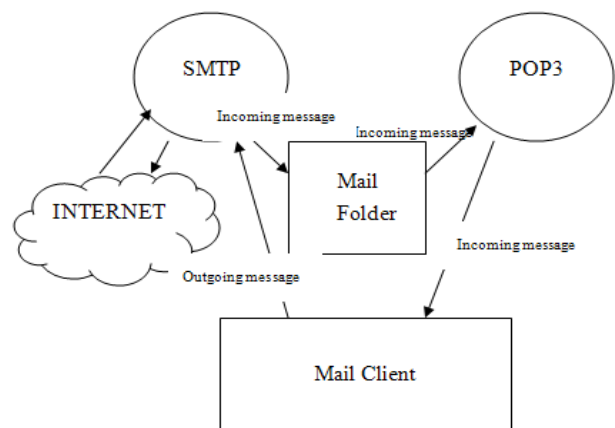


Figure 1: Concept of E-mail connection [2].

iii. E-mail programs

There are some common popular e-mail programs include Eudora Light, Netscape Mail and Outlook Express. All these programs have roughly the same features, and allow you to create, send, receive and organize your messages. In particular, Outlook Express will be chosen as a demonstration in the following discussion.

iv. E-mail Addresses

You can send a message to anyone around the world if you know the person's e-mail address. Furthermore, to get an e-mail, you must have an e-mail address for the message to get in. An e-mail address defines the location of an individual's mailbox on the internet. The e-mail address has two parts: the first part is the domain name of the host computer on which you check your mail, and the second part is the user name of the mail account, and the two parts are separated with an ampersand (@), and an e-mail address cannot contain spaces. Domain name: the location of the person's account on the Internet. Periods (.) separate the various parts of the domain name. user name the name of the person's account. This may be a real name or a nickname. For example, kyc@cuhk.edu.hk.

2. Methodology

A good software development practice starts with a good understanding on the user requirements. A requirement is a feature of the system or the description of something that the system is capable of doing in order to fulfill the system's purpose [3]. Requirements are to be defined according to two categories which are the functional requirement and non-functional requirement (Kendall, 1996). The functional and non-functional requirements of SRRS are gathered by way of:-

A. Software Process Model

The system development methodology is a method to create a system with a series of steps or operations or can be defined as system life cycle model. Every system development process model includes system requirement such as user, needs and resource as input and a finished development as output as shown in figure 2 [4].

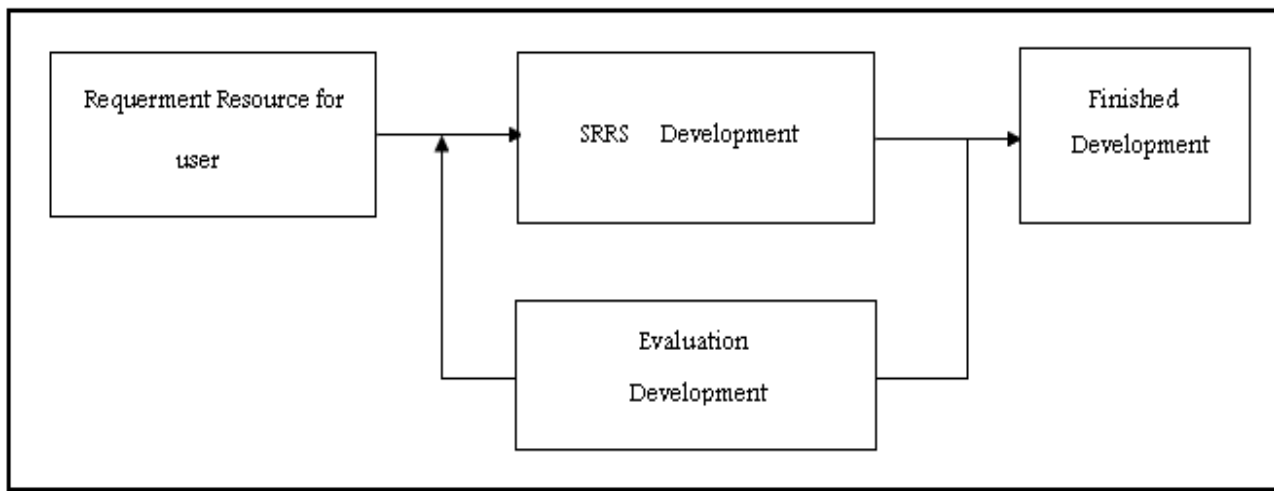


Figure 2. System Process Mode.

A software process model is an abstract representation of a software process. Each process model represents a process from a particular perspective, and thus provides only partial information about that process [4],[5]. The process model that is used to develop the system is the incremental model. This model uses the waterfall model in an iteration fashion. It focuses on the delivery of an operation product with each increment. It works well to address technical risk management and ramp staffing with the complexity of the work. Figure 3 shows the incremental model [4],[5].

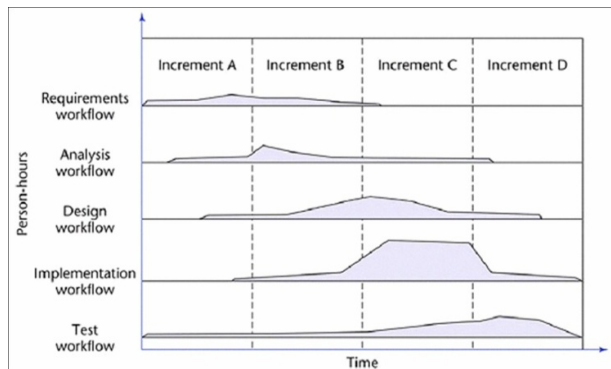


Figure 3 Incremental Models [6].

B. Choice of Incremental Model

The incremental build model is a method of software development where the model is designed, implemented and tested incrementally until the product is finished. It involves both development and maintenance. The product is defined as finished when it satisfies all of its requirements [4],[6].

This approach is favored by many object-oriented practitioners. It basically divides the overall project into a number of increments, and then it applies the waterfall model to each increment [4]. The system is put into production when the first increment is delivered. As time passes additional increments are completed and added to the working system. The incremental development model for object-oriented project comprises the following phases [6], [7]:

i. Requirements Workflow

The first phase of this development involves the Requirements specification, which is the usual starting phase of all software process models. The requirement needs to be determined at the beginning phase of the

project. It includes users of the system, the system's services, constraints and goals. These requirements are described and defined in details, serving as the system specification [4]. Those analyses involved the functional requirements and the non-functional requirements. These sets of requirements are based upon extensive use and development of SRRS. Some of the requirements were gathered through user feedback and user requests conducted in an informal manner. The main goal of these requirements is to develop a system that enables student to check their recorded data. In this phase, the information about the user's requirements shall be gathered and documented. This phase can last from a few days to few weeks and is usually carried out on-site or through customer communication. Discussions shall be held to understand the user's requirements. The software requirements shall be documented. The documentation shall use the terms familiar to the customer and shall encompass the entire functionality of the product as foreseen by the customer (Student) [4].

A review of the user requirement document is to be done. User's requirements will then be converted to implementation specific statements. The user-interface shall also be detailed. The user's software requirements shall be thoroughly understood to convert to system specifications. The software requirements specifications shall be documented using *Use Case diagram*. The documentation shall use the implementation specific terms for the ease of understanding for the designers and developers.

ii. System Analysis and Design Workflow

The next stage involves identifying and prioritizing user requirements. User requirements are prioritized and the highest priority requirements are included in the early increments. In this phase, the use cases are identified, the deployment and component diagrams are designed. The system design document shall be prepared [4]. As we are developing web-base application framework and subsequently build SRRS based on this framework. The framework components that need to be developed are identified as follows:-

- Design of framework architecture
- Setting up application server
- Design of security model

Once the base (framework) has been developed, we need to identify the components required for setting up SRRS system. The components that need to be developed are identified as follows [4].

- Design and implementation of the new database management system
- Design of the user client interfaces
- Design of user module
- Design of security module

iii. Implementation Workflow

In this phase, the actual coding shall be done according to the programming standard. The code shall be unit tested. The programming standards to be used shall be identified. This is one of the most critical phases as failure in coding will result in collapse of the whole project. New training skills are required, which have to be learned or developed. While system analysis and design workflow identifies the components that need to be developed, this phase develops and implements all the design requirements identified in the earlier phase.

The development involves the implementation of SRRS. This phase involves the installation of .NET framework 2.0, the Microsoft Access 2000, and the programming environment, which is ASP.NET. In order to implement this phase, new skills have to be developed. Specifically, this means learning the ASP.NET programming language, the .NET Framework, and how to implement Microsoft Access 2000 functionality [4].

iv. Testing Workflow

In the system-testing phase, the product shall be tested module-wise and the interdependencies among the modules shall be validated. The functionality of the product shall be tested as a whole. The product needed to be tested for conformance with the system requirements, that is, the overall goal of the project. At this phase, user involvement is vital to the design, redesign and validation of the user interfaces. During the user acceptance-testing phase, SRRS system shall validate against the user requirements, acceptance criteria and acceptance data. Figure 4 shows the incremental development system [6][7].

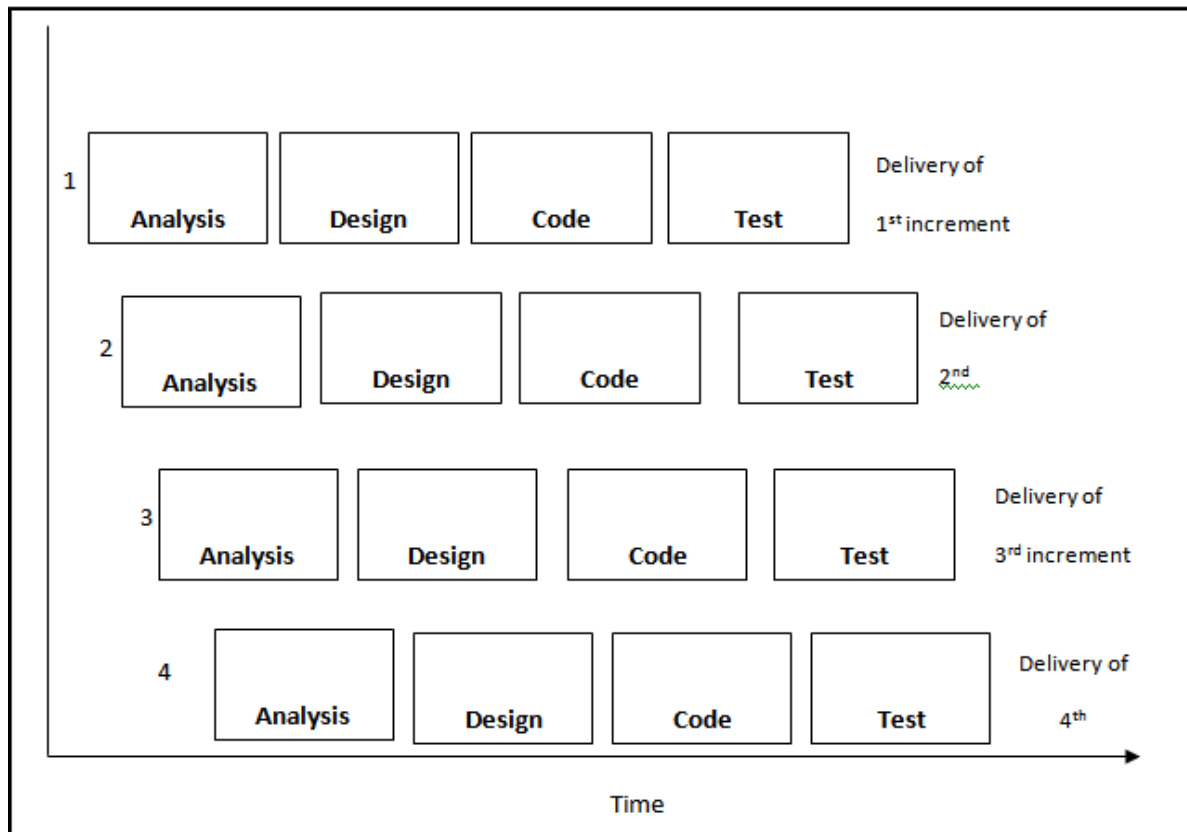


Figure 4 Increment Deployment Cycles [6].

C. Advantages Of Incremental Development Model

- There is a lower risk of overall project failure. Although problems may be encountered in some increment, it is likely that some will be successfully delivered to the customer.
- Customers do not have to wait until the entire system is delivered until they can gain value from it. The first increment satisfies their most critical requirement so the software can be immediately used.
- It provides an opportunity to explore alternative strategies and revisions.
- Early feedback is generated because implementation occurs rapidly for a small subset of the system.
- It ensures that the developers build the right system according to the specification and verification of the system.
- More flexible on requirements change.

- More parallelism saves lots of time! However, there are still some weaknesses in this model
- Extra time spent on testing, documenting and maintaining a “temporary” product.

3. System Analysis of SRRS with MMS

A. System Requirement Analysis

The purpose of system requirements analysis is to get a thorough and detailed understanding of the business need as defined in Project Origination and captured in the Business case. Generally, Requirement analysis always classified as functional requirements and non-requirement [4],[7],[8],[9].

i. Functional Requirement

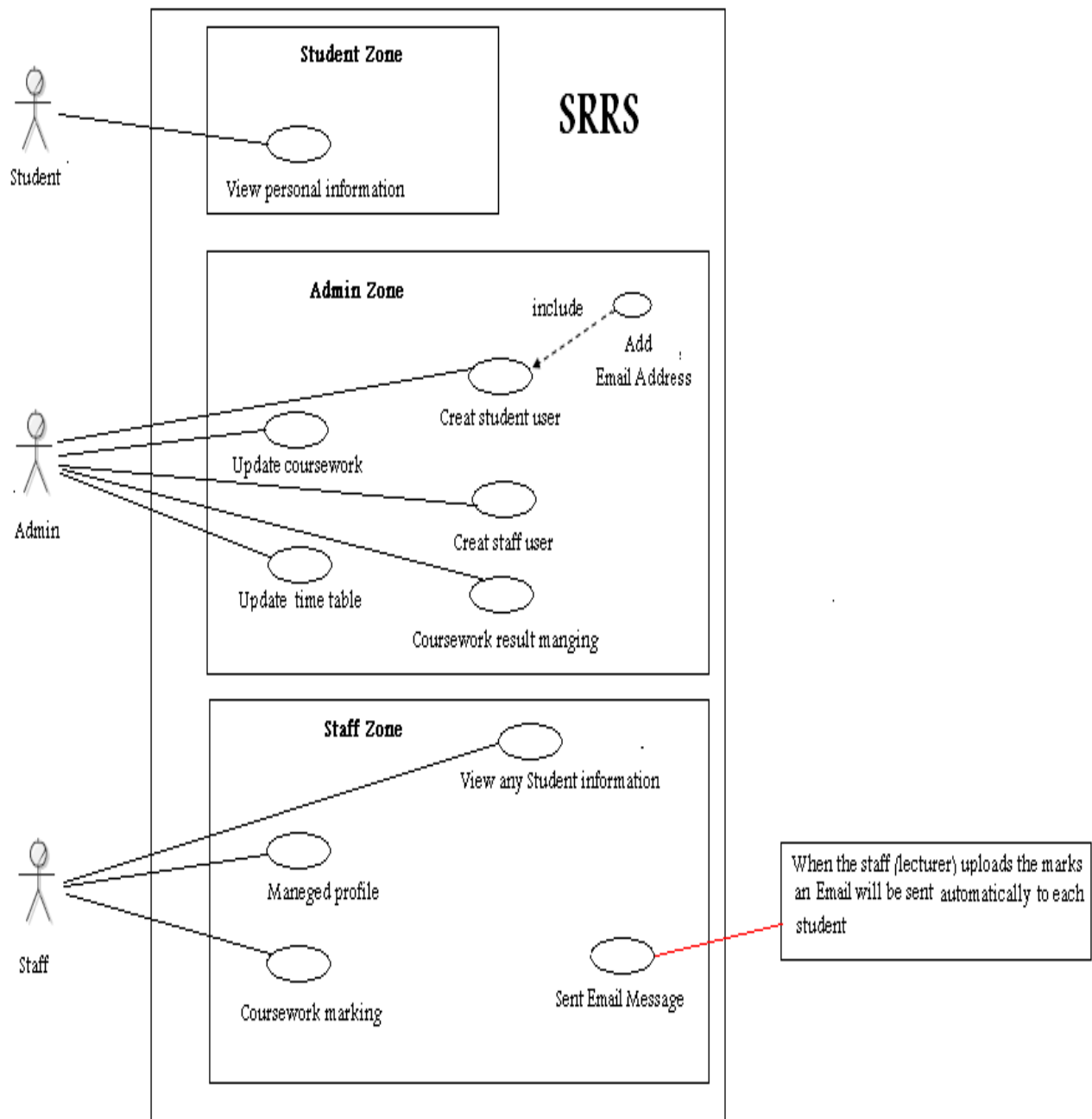


Figure 5: System Module

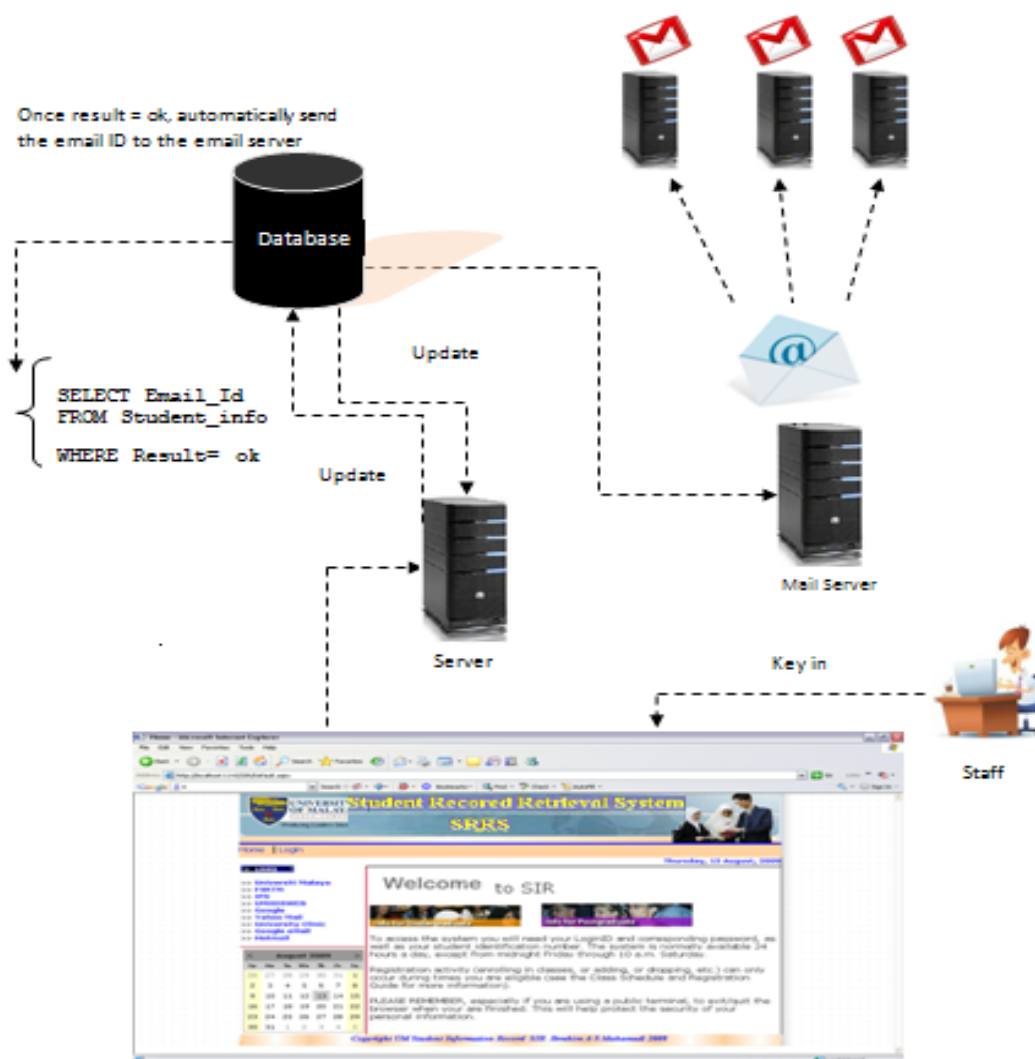


Figure 6: System Module for Send Email

A. Flexibility

The design and built of the system regarding to customer requirements. When one of university requests from me built SRRS for the keeping of student records. The interaction process (download, upload, modify, delete, verify.....Etc). After 2-3 years or less or more Database, SRRS will be an instrument to keep tracking for student records. The interface can be extended to DB capacity. So it is flexible for any request regarding to the customer requirements [4][10].

B. Usability

In general usability refers to how well users can learn and use a product to achieve their goals and how satisfied they are with that process. Also declare to users' how to use the product quickly and easily to

accomplish their tasks. In my design i took some considerations that:

- Who are the users, what do they know?
- What do users want or need to know?
- What is the general background of the users?

So the SRRS is considered as one of the easiest system in use. As researchers know the most users in the faculty are familiar with windows operating system, so this project has been used windows programs in the designing because of its popularity and also facilitate to user's access to his/her requirement direct by clicking buttons. And also the interface has designed clearly to give the users easy view [4][10].

C. Security

Security is process to prevent and detect unauthorized use of your system. Prevention measures help you to stop unauthorized users (also known as "intruders") from accessing any part of your system. Detection helps you to determine whether or not someone attempted to break into your system, if they were successful, and what they may have done. So In SRRS we have user name and password the users cannot access the system if they do not have username and password to give them authorization, this process to avoid any problem may be happen from illegal users. In addition, if user has username and password cannot do any things there is a limits for the authorization, the normal user can do search, download and print only, but the administrator/lecturer have authority to create delete edit and upload. This Restrictions process to make a system more secure and avoid any illegal use for the system [4][9][10].

D. Maintainability

Depending on the definition of Institute of Electrical and Electronics Engineers (IEEE Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries. New York, NY: 1990.), Maintainability is the ease with which a software system or component can be modified to correct faults, improve performance, or other attributes, or adapt to a changed environment. SRRS system is supposed to be corresponding to maintainability standard definition. This function includes SRRS Software Re-Engineering as changing the form of existing software without changing its functionality. Normally such changes are carried out in order to improve its maintainability, portability, or the efficiency of software. SRRS Software Re-engineering can include any or all of the following:-

- Improving the structure of the text;
- Control Flow Restructuring;
- Re-modularization;
- Language Conversion;
- Redistribution of functionality over a network;
- Face-lifting (improving the front end without changing the functionality);
- Migration between platforms or environments;
- Re-documentation
- Improving methods of carrying out software maintenance;
- Improving methods of visualization, assessment, and comprehension;
- Development of tools to support such improved methods;

Re-modularization of the objective of this project is to develop methods and tools which can do some or all of the following:

- Identify suitable pieces of code (or modules), within an application can gets good interface and easy to use.
- Identify the data and procedural objects which are controlled by the Admin Staff for ease use with adequate capability to discover and correct errors.
- Identify suitable pieces of code, which are supporting the system for assumption any new uploading data.

4. Conclusion

To conclude, this paper has presented an enhancement to the SRRS (Student Record retrieval System) by having an Email automatically being sent to each student once a lecturer submits a marking to their records. This operation will ensure the student be informed of the new data or that

He has an updated info. Farther, we are currently experimentation the same to short message service embedded to the system.

Acknowledgement

Thanks in advance for the entire worker in this project, and the people who support in any way, also I want to thank University of Malay for the support they offered,

References

- [1] Abels, E.G. (1996). The email reference interview. RQ, Vol.35,P.P 345-358.
- [2] Bristow, A. (1992). Academic reference service over electronic mail. College & Research Libraries News, Vol.53, P.P 631-2, 637.
- [3] Abelson, R. P. (2008). "Script processing in attitude formation and decision making," in J. Carroll and J. Payne, editors, Cognition and social behavior, Hillsdale, NJ: Lawrence Erlbaum.
- [4] Ibrahim A.S.Muhamadi, M.A Zaidan, A.A Zaidan, B.B Zaidan, "Student Record Retrieval System Using knowledge Sharing", International Journal of Computer Science and Network Security (IJCSNS) , Vol.9, No.6 , ISSN : 1738-7906, pp. 97-106, 30 June (2009), Seoul, Korea.
- [5] Abernathy, W. J. and Utterback, J. M. (2008). "Patterns of industrial innovation," Research Policy, 14: 3-22.
- [6] Allen, T. J. (2008). Managing the flow of technology: Technology transfer and the dissemination of technological information within the R&D organization, Cambridge, MA: MIT Press.
- [7] Almeida, P. (2007). "Knowledge sourcing by foreign multinationals: Patent citation analysis in the U.S. semiconductor industry," Strategic Management Journal, 17 (winter special issue): 155-165.
- [8] Almeida, P. and Kogut, B. (2006). "Localization of knowledge and the mobility of engineers in regional networks," Management Science, 45: 905-917.
- [9] Amburgey, T. L. and Miner, A. S. (2005). "Strategic momentum: The effects of repetitive, positional, and

contextual momentum on merger activity,” Strategic Management Journal, 13: 335-348.

- [10] Ancona, D. and Caldwell, D. (2005). “Bridging the boundary: External activity and performance in,” Administrative Science Quarterly, 37(4): 634- 656.

Authors Information



them still under reviewer.

Ibrahim A.S. Muhamadi- he is master student in Department of Information Technology/ Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia, He is a late comer to IT filed after a carrier of 30 years in the airlines business as a fling captain. He has contributed to many papers some of



conferences and journals, he has done many projects on Steganography for data hidden through different multimedia carriers image, video, audio, text, and non multimedia carrier unused area within exe.file, Quantum Cryptography and Stego-Analysis systems, currently he is working on the multi module for Steganography. He is PhD candidate on the Department of Computer System & Technology / Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia.

Aos Alaa Zaidan - He obtained his 1st Class Bachelor degree in Computer Engineering from university of Technology / Baghdad followed by master in data communication and computer network from University of Malaya. He led or member for many funded research projects and He has published more than 40 papers at various international and national



Dr. S. Ravi Raja, Post Doctoral Research Fellow, Department of Artificial Intelligence, Faculty of Computer Science & IT, University of Malaya, Kuala Lumpur, Malaysia Ph. D Computer Science, University of Honolulu, Delaware, USA.



Mussab Alaa Zaidan - he is master student in Department of Information Technology/ Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia, He has published many papers at international conferences and journal.



Bilal Bahaa Zaidan - he obtained his bachelor degree in Mathematics and Computer Application from Saddam University/Baghdad followed by master from Department of Computer System & Technology Department Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia, He led or member for many funded research projects and He has published more than 40 papers at various international and national conferences and journals. His research interest on Steganography & Cryptography with his group he has published many papers on data hidden through different multimedia carriers such as image, video, audio, text, and non multimedia careers such as unused area within exe.file, he has done projects on Stego-Analysis systems, currently he is working on Quantum Key Distribution QKD and multi module for Steganography, he is PhD candidate on the Department of Computer System & Technology / Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia.



Chengetai Mapundu - has received his master of Information Technology Degree from Department of Computer System & Technology Department Faculty of Computer Science and Information Technology/University of Malaya /Kuala Lumpur/Malaysia, January 2009. Also holds MBA from Midlands State University, Gweru Zimbabwe. Currently studying PHD and Lecturing Part Time at the National University of Science and Technology, Bulawayo, Zimbabwe. Interested in research and IT