Enhanced Admin Role of the Student Record Retrieval System using Knowledge-Sharing and Rationale Method

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Abstract
Web development to become a global knowledge web development , it 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 enhancement to the role of the admin in SRRS using knowledge-Sharing and Rationale Method is presented so as to be more effective in administrating the student records. The enhancement to the system aimed to allow the admin to manage student users, manage staff users and manage information for two part first part to edit the postgraduate information and the second part to edit the undergraduate information The proposed system has been developed using ASP.Net.

Keyword:
Student Record Retrieval System (SRRS), Knowledge management, web development

1. Introduction

Knowledge management involves the panoply of procedures and techniques used to get the most from an organization's tacit and codified know-how [1]. While defined in many different ways, knowledge management generally refers to how organizations create, retain, and share knowledge [2],[3].The study of knowledge sharing, which is the means by which an organization obtains access to its own and other organizations' knowledge, has emerged as a key research area from a broad and deep field of study on technology transfer and innovation, and more recently from the field of strategic management. Increasingly, knowledge-sharing research has moved to an organizational learning perspective. Indeed, experience and research suggest that successful knowledge sharing involves extended learning processes rather than simple communication processes, as ideas related to development and innovation need to be made locally applicable with the adaptation being done by the 'incumbent firms [4] or ' the local doers of development' [5], for the ideas to be successfully implemented. The literature identifies five primary contexts that can affect such successful knowledge-sharing implementations, including the relationship between the source and the recipient, the form and location of the knowledge, the recipient's learning predisposition, the source's knowledge-sharing capability, and the broader environment in which the sharing occurs. A synthesis of this research suggests three types of knowledge-sharing activities to be evaluated. First, analyses of the form and the location of the knowledge are important because each can affect the types of sharing processes that will be necessary as well as how challenging these processes might be. Second, the types of agreements, rules of engagement and managerial practices adopted by the parties are important to evaluate in that they can shape both the flows of resources and knowledge between the parties and the actions taken to overcome and accommodate significant relational differences between the parties. Third, the specific knowledge-sharing activities used are important in that they are the means through which the parties seek to facilitate knowledge sharing.

2. Methodology

Software life cycle describes the set of processes or the stages from the conception of software to its implementation, delivery, use and maintenance. This stages have to be followed in order during the developing a software. In this chapter, a full description of the methodology applied in the development of this system is featured. Apart from that, the software requirements to build the system will also be discussed [6].

A. System Development methodology

The system development methodology can be defined as the method to develop a system with a set of procedures or operations. It is also known as system life cycle model. In every system development process model, the input

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includes system requirements (users, needs, resource) while the end product will be the output. There are a few types of process models in system development. Below are some of the most commonly used methods [6]:

- Waterfall Model with prototyping
- V Model
- System Development Life Cycle (SDLC)
- Spiral Model
- Prototyping Model
- Operational Specification Model
- Transformation Model

For developing my system, I have chosen V Model as the system development process model. The V Model demonstrates how the testing activities are related to analysis and design. The coding forms the base of the V, while requirement analysis, system design and program design makes the left hand side and unit & integration testing, system testing, acceptance testing and operation & maintenance right hand side respectively. The sample is shown in Figure 1 below. If there are problems found during verification and validation phase, then the left side of the V can be re – executed to fix and improve the requirements, design and code before the testing steps on the right side are reenacted (Pfleeger, Shari Lawrence, 2001). This is the implication that can be read out from the V Model. Indeed, it actually has the potential to demonstrate the relationship between the testing activities and the analysis and design [7].

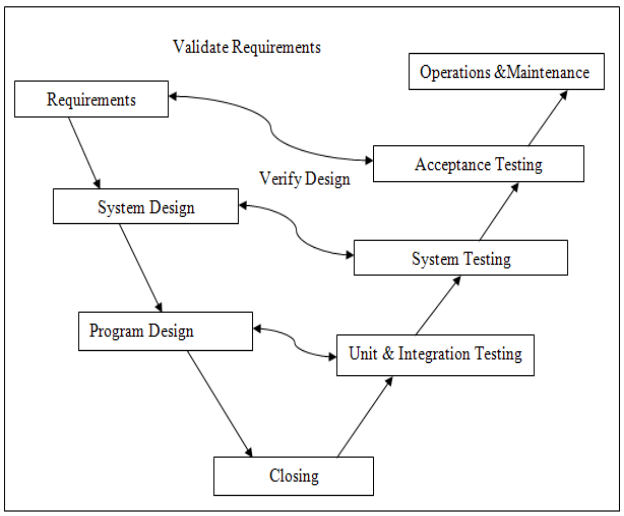

Figure 1: The V Model [7].

B. Rationale of Methodology Approach

There are 8 main stages that are contained in the V Model. The stages are as stated as below [7][8]:

- Requirements Analysis

This is the stage where problems are identified, then the information requirements are defined and the system requirements are analyzed. The functional descriptions and requirements are also specified. There are also functional and non – functional requirements that need to be defined. As for the project, the requirements gathered include the recognition and identification of algorithms, functionality, performance, interface and constraints of the system.

- System Design

This stage is where all the defined requirements from the requirements analysis are converted into hardware and software requirements. It also includes deciding the right system development methodology, system architecture, content design, interface representation, data structure, conceptual design and technical of image retrieval system are also required in this stage.

- Program Design

Here, the design of overall system structure, flow charts and accurate data flow diagrams are planned so that the processes within the system are functional and correct. In this phase, algorithms are defined and document for each module in the image retrieval system that will be realized as code. It involved drafting out data flow diagrams that resembles the functionality of the system and its subsystem.

- Coding

The coding, which is actually the process of writing the program by using a programming language and application development tools depending the design specification comprehendible by the computer, has to be done in a careful manner.

- Unit and Integration Testing

Unit testing will be done on the smallest unit or component of the system design to check whether all the components functions properly. Integration testing is conducted on a system to check if there is any trouble with the interfacing each and every module of the newly developed system. The main objective of this mode of testing is to determine that the modules can be incorporated into a meaningful working system.

- System Testing

The main reason for this phase is to identify the defects or limitations of the system. Apart from that, the developer can also know the true capabilities of the system which will help to check whether it is performing as per the client's requirements. The system actually integrates different sets of functioning modules; therefore the test has to be conducted accordingly.

- Acceptance Testing

In this stage of development, the user will personally run through the system to ensure that it is developed as per the initial requirements. At this juncture the whole system will be put into a complete test and ready for practical usage. The client will determine if there is any form of error or inconsistency in terms of performing its tasks.

- Operation & Maintenance

The last but certainly not the least is the operation and maintenance phase. This takes place only after the system is put into practical use. The task of maintenance involves detecting and correcting errors that have been unable to track down earlier. Apart from that, the task of system improvisation and future enhancements are also inclusive of the general role of this stage.

C. Justification of Methodology

Although there are a variety range of choices for development models, I had chosen the V Model for my project, the blood image retrieval system [9]. The specific reasons are as follows:

- V Model allows thorough analysis and planning prior to taking any further actions. This indicates that the developer has a luxury to decide carefully on the functions of the system and the respective coding.
- The model is one of the best options as it is an easily comprehendible by the reader.
- The model has a systematic nature.
- The model also has the space to perform verification during the initial testing of the system development.
- The model has an iterative structure that can work at any time.

3. System Analysis of SRRS

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

i. Functional Requirement

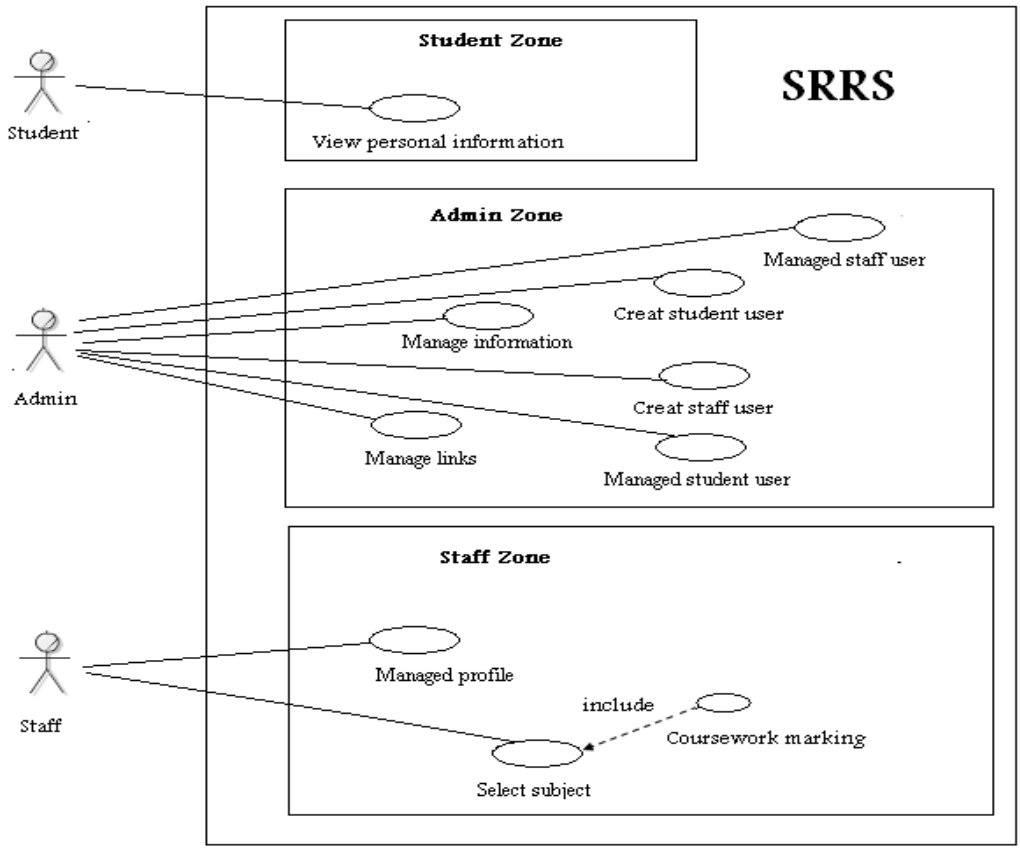

Figure 2: System Module

ii. Non-Functional Requirements

A. Integrity

Integrity is the quality of correctness, completeness, wholeness, soundness and compliance with the intention of the creators of the data. It is achieved by preventing accidental or deliberate but unauthorized insertion, modification or destruction of data in a database. Data integrity is one of the six fundamental components of information security. Integrity it's very important process not just for SRRS, it's important for any system to prevent any mistake or errors may happens from the users or operators during using the system. The most important points in an integrity process in SRRS are verified and checked are records or profiles. After a new account is uploaded to SRRS database, admin staff must check and verify the new data or profile file is in SRRS database [10].

B. 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 [10][11].

C. 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 toke 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[10][12].

D. 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 [10].

E. 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 [12]. 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. Selection of Development Tools

It is an important task to identify and select the correct tools that will be used to build a software system. In this section, the development tools are discussed thoroughly.

A. Application development technology

As has been stated at the beginning of this report, this project was to be developed by Microsoft .NET. The main reason was due to the purpose of the project – to build a prototype in .NET, identify and solve technical challenges in order to help Bradford Home Hunter team re-engineer the existing system from ASP to ASP.NET. The consequence was that there were no choices for application development tools. However, if given opportunities to select among several alternatives, the author would still have chosen .NET technology. This is because [13].

- The application development language ASP.NET supports true OOP with extensive choices of programming languages and powerful class libraries which reduces difficulties in design and implementation;
- Powerful database connectivity and management with ADO.NET;
- Easier and cheaper deployment for Bradford Home Hunter – since the existing system was developed in ASP, upgrading from ASP to ASP.NET should not incur many changes in terms of software and hardware support;
- Superior compatibility and mobility guarantees good extensibility – as has been discussed above, the cross-platform interaction capability would enable the application to be accessed via multiple devices3 such as PCs, PDAs, Wireless Network enable cell phones, digital TVs etc. The benefits are clear that customers can have easier and cheaper access to the application.

B. Database development technology

Microsoft access was to be used for database development in the paper. As it is easier to use than command-line based MS Access.

- Many users can access the system (simultaneously).

5. Reviews on Latest Technologies

A. Client –Server Architecture

Client-server is a network architecture which separates the client (often a graphical user interface) from the server. Each instance of the client software can send requests to a server or application server. There are many different types of servers; some examples include: a file server, terminal server, or mail server. While their purpose varies somewhat, the basic architecture remains the same. Client-server architecture is intended to provide a scalable architecture, whereby each computer or process on the network is either a client or a server.

a) Properties of a SERVER

- Passive (Slave)
- Waiting for requests
- On requests serves them and send a reply

b) Properties of a CLIENT

- Active (Master)
- Sending requests
- Waits until reply arrives .

B. Tiered Architecture

A generic Client/Server architecture has two types of nodes on the network: clients and servers. As a result, these generic architectures are sometimes referred to as "two-tier" architectures. Some networks will consist of three different kinds of nodes: clients, application servers which process data for the clients and database servers which store data for the application servers. This is called three-tier architecture. The advantage of an n-tier architecture compared with a two-tier architecture (or a three-tier with a two-tier) is that it separates out the processing that occurs to better balance the load on the different servers; it is more scalable. The disadvantages of n-tier architectures are [10][11][12][13]:

- It puts a greater load on the network.

- It is much more difficult to program and test software than in two-tier architecture because more devices have to communicate to complete a user's transaction.

- It is good architecture too. Figure 3 show three tire architecture.

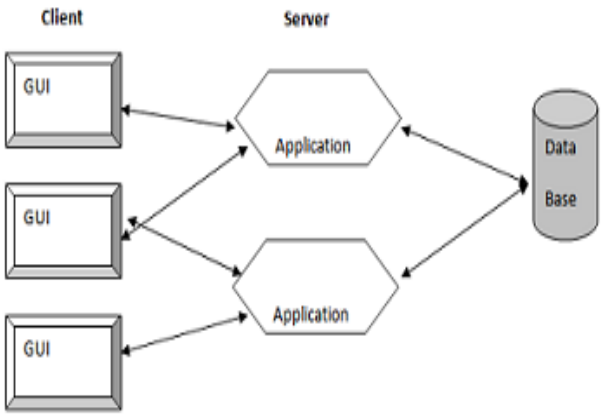

Figure 3: Three tire architecture

6. Interfaces of the SRRS development

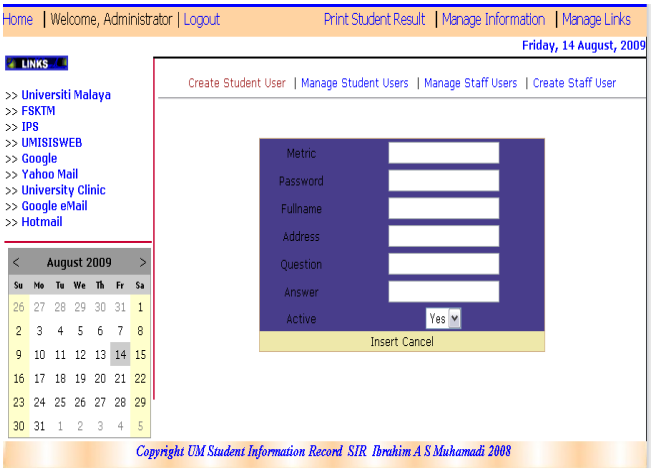

Figure 4. Shown interface create student user

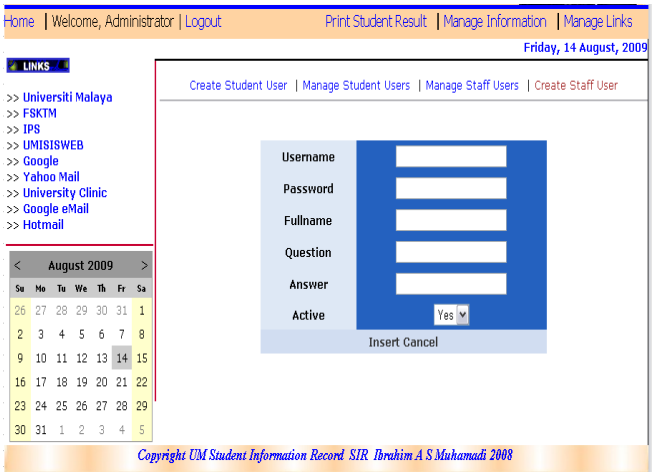

Figure 5. Shown interface create staff user

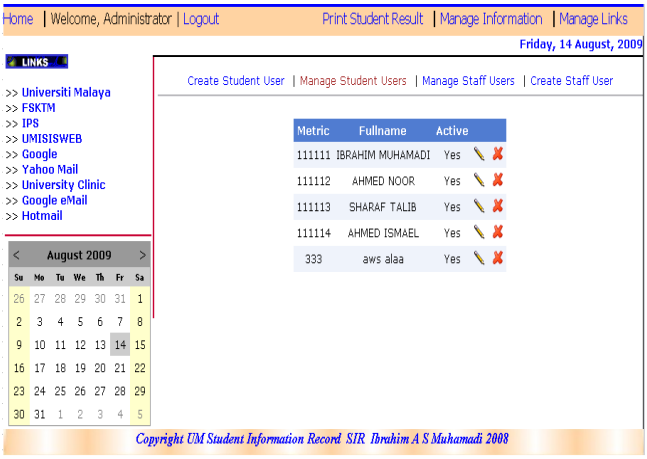

Figure 6. Shown interface manage student users

Figure 7. Shown interface manage staff users

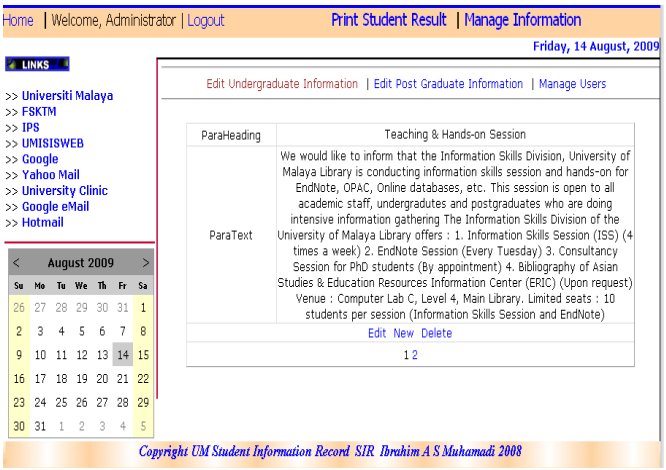

Figure 8. Shown interface edit undergraduates students

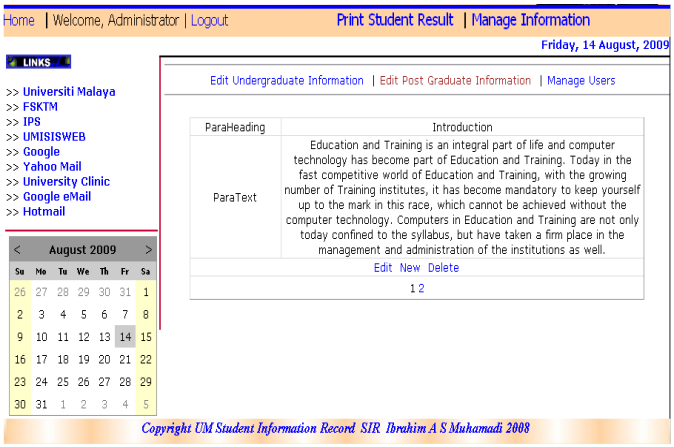

Figure 9. Shown interface edit postgraduates students

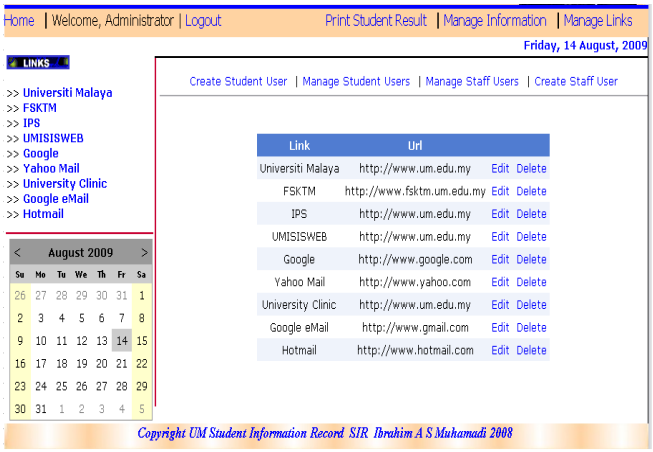

Figure 10. Shown interface manage links

7. Conclusion

The important conclude for this paper presents an enhancement to the role of the administrator in administering the (SRRS) Student Record Retrieval System so as he can manage staff users, manage student users., and manage information for two part first part to edit the postgraduate information and the second part to edit the undergraduate information the proposed system has been developed using ASP.Net.

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