An Implementation Of An Online Based Registration System In Tertiary Institutions In Zimbabwe

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ABSTRACT

Web-based services offer users convenient access to and the ability to manipulate information that is of concern to such services. Due to the high requirements in functionality and performance, these systems are often very large in terms of the size of the underlying software. The use of Component-Based Design (CBD) for web-based software comes into play for this very reason. Not only does Component-Based Software Engineering (CBSE) address the manageability issue of web based software, but it also ensures greater consistency and high re-usability of web-based components. These advantages in turn lead to better productivity and hence better quality of the overall design of the system. In order to exemplify the effectiveness of CBD, the design and implementation of a component-based online course registration system is proposed for this project. The application will allow students, department members, faculty members and the registry members to view and make changes to course registration related issues for a specific semester. The system will be developed using a Service-Oriented Architecture (SOA), which involves grouping components into web services.

Keywords: Web-based, Component-Based Design, Component-Based Software Engineering, online course registration, Service-Oriented Architecture.
1.1 Introduction

The study sought to provide a more convenient way to conduct course registration at a tertiary institution which has a very wide coverage and an unwavering support from many individuals who benefit from it and has also become an instrument for students and institutions to save time and organizations that are immensely benefiting from its services. Having seen that time plays such a paramount role, in the efficiency of every system it is a highly prioritized role to enhance the convenience of the online registration in its conduct so as to maintain the wide range of beneficiaries to follow through the dynamic technologies that are taking shape and business of today. In educational institutions the effect is more felt due to the crowding and the hassles that are normally termed the last hour rush but bearing in mind that it is the human norm of having to folk out money at the due time.

1.2 Background to the study

The field of Information technology has improved tremendously in the past decade with the invention of all kinds of new technologies for example e-commerce, e-learning and online registration to mention just a few. The proposed model is to implement online registration system at Bindura University of Science Education (BUSE) a tertiary institution in Zimbabwe with the overall view of improving efficiency in the registration process. The need to speed up the process of registration at institutions of higher learning is more vital and need is there to automate the process itself and move away from manually visiting the school for the process. This has wasted much time for students and money as they sometimes travel only to register and some have failed to meet the stipulated time frames.

Registering for courses of the semester in a faculty is an activity students undertake towards the end of every semester. The students at the Bindura University, like all other universities in Zimbabwe manually fill their course registration forms by collecting them from the Assistant Registrar’s (AR) office. These forms are approved by the students’ Department head first and then the Dean of Faculty before they are returned to the AR’s office again for processing. Since
there are a lot of chronological steps that need to be followed in the manual registration process, chances are high that mistakes can be made for instance students can register a course that is not being currently offered that semester or registration of a course which a student would have failed the prerequisite course. These mistakes compounded by the monotony involved in the manual registration process has got a huge impact to the university in terms of administration and efficient running of the university, because registration is the crucial starting point of all other processes in an academic year. BUSE lecturers complain on time lost during the first weeks of a semester because students spend time in long queues trying to register thereby failing to attend lectures since teaching would have commenced yet students will be still registering.

This paper presents our experience in developing, deploying and running an online course registration system at BUSE. In this system, students register for their courses online, which are processed automatically to provide a set of reports to the administrative staff at AR’s office, where the information is used. Most aspects of course registration and enrolment such as pre-requisites and minimum qualification the maximum number of courses a student can register per semester, etc. are checked automatically reducing the burden (time and pressure) of the advisers and the administrative staff.

1.3 Research Objectives

1. To design and implement an online registration system.
3. To analyze the impact of an online registration system at Bindura University.

1.4 Research questions

- How can we make use of the knowledge encapsulated in existing catalogues to improve registration at Bindura University?
- How can systems be validated against our requirements?
What is the system’s long-term viability (are they vulnerable to future scientific or technical breakthroughs)?

1.5 Justification/significance of the study

The need to utilize time wisely for those students who travel just to register at the institution and who find the unbearable queues just to collect a form that one has to move around to get it signed and sometimes finding the responsible personnel not in the office at the time of need. This brings more frustration especially when one has a lot of work to do other than being at the institution to register. The need to do all this process at the comfort of one’s home or work place thereby maximizing the time one puts on personal issues during the vacation time. There is a notable loss of time of the lectures on the first days when those who registered late could not attend the lectures in a bid to finish off the registration process. The aspect that the Information Technology is seen as another great supporter of the environment friendly development, this system by getting rid of the manual paper work would have complied with the Green IT initiative.

2.0 Literature review

2.1 Online Registration

An online student registration system streamlines the application, registration, and monitoring of students in a school or training institute. According to Morris Wall (1990), online registration systems are websites that allow users to sign up for memberships, events and training by completing a form. Online registration systems are replacing manual processes, such as registering by telephone, mail or at events using paper forms. Many universities and educational institutions have a wide range of courses, students and faculty (Wells 2001). Registering for classes on line reduces paperwork, personnel, cost and conserves resources. It has been defined by Ralph E. Johnson (1996) as a system where many of you register for courses online. The computer knows all the courses that are available each semester and also knows which ones you
are taking. It makes sure that a student can't register for too many courses, and that a course is not oversubscribed.

2.2 Existing Online Registration Systems

2.2.0 Online Registration University of Peradeniya

There are a number of online registration systems that have been made in different context and to suit the need arising. Gunawardana et al in December 2008, researched on the online course registration for the faculty of engineering in university of Peradeniya and in their research they generated a solution named Online Registration. The project was divided into three namely, Online Registration which is the start-up project of their system, and depending on Data Access and Web security. Data Access would actuate the data transaction between the client and the server and Web Security would configure the database and handle the authentication and authorization. The research described their experience in designing, developing and deploying an online course registration system at the Faculty of Engineering in University of Peradeniya. The system has not only reduced the burden of all parties involved in the course registration process, but also improved the process by reducing errors.

Though their system managed to reduce the errors significantly it lacked the continued interaction with the student in the updates of the student’s registration status updates. It also lacked accountability as some stakeholders in the registration process do not have access to the system.

2.2.1 The Web Portal

Ala'a M. Al-Shaikh from the Computer Department at the Institute of Public Administration (IPA) Dammam in Saudi Arabia worked on the production of a web-based application designed, developed, and implemented as a web portal that enabled different parties working with
Associate-Degree General Examination to benefit. They came up with a system that tried to curb the registration problem but the following points were lacking on the system:

- Short Messaging Service - this is a very important service which allows continued updates to the student about their registration status.
- Upgrading the system to support AJAX (Asynchronous JavaScript and XML), this reduces the load time of each page, and thus makes interacting with the system much easier and faster.
- Customized Reports: This is a service which allows stakeholders to manage the reports they need, so that the system never controls the way and format in which reports are displayed, but each user can customize a set of reports as they are seen appropriate to their usage.

2.2.2 Online Course Registration System

An Online Course Registration System Project Report from Tolstoy Newtonraja and AdityaNafde of the Computer and Information Science & Engineering at the University of Florida saw that there was need for structured storage, modification and maintenance of huge amounts of data that had resulted in the emergence of the Database Management System (DBMS) as one of the core fields in the Computer Science industry. DBMS is the system of computer software that is aimed to provide a managing tool for maintaining the data, through various data models.

An Online Course Registration system for University of Dataville was developed with a front-end web interface and a back-end database. An example of the system had been University of Florida’s ISIS Registration. A Database system had to be chosen as the back-end such as Oracle, MySQL, Microsoft SQL Server, DB2, and Access. A web server had to be chosen for the front end such as Tomcat, Glassfish, Run, etc. A server side language had to be chosen such as PHP, JSP, ASP, etc. The practical implementation of a real time database management system made
them understand the intricacies involved in designing the database schema with inter related constraints and the complexity that exists in integrating the front end system with the back end data-store. Their project was developed keeping in mind the functionalities for students and instructors and the project also provided all the functionalities specified in the project document and more functionality can be added over the existing one so that the system has more enhanced features and is more efficient.

In this project, a web-based course registration system is to be designed and implemented using CBD. The main aim is to utilize the advantages of component-based development to solve the issues associated with most online course registration systems. Developing this online system using components will provide the following benefits: Quicker Development of System, Better Services Provided to Users, Friendlier User Interface, and Adaptable to Changes in Functionality, Flexibility in Upgrade and Replacement of System Components, Easier Maintenance, Simpler Testing and Analysis.

The proposed web-based course registration system is a system that allows students and faculty members to have access to different services.

2.3 Summary

Good systems, if well implemented, can propel excellence to the next level. Online registration demands the integrity of those in play and the efficiency of the system. The system that is being proposed will fill the gap by providing an actual online registration system which will enable the students to register outside the campus. More and more, institutions in Zimbabwe are contemplating on the registration aspect component, either exclusively or in conjunction with other registration systems such as traditional paper registration system. The adoption of online support for internet registration systems in any institution would entail a considerable overhaul of traditional registration methods. Students would eventually depart from having many forms of
traditional registration methods and data-gathering processes to having just two methods, delivered by the superior connectivity characteristics of online registration.

There is a great need to standardize the method of registration throughout the students at the same institution in order to enhance and streamline the registration process – this is evident by the recent publications of e-registration journals and the academic interest in these areas. Many of the security issues debated involve technically based solutions, currently being developed, to thwart attacks on e-commerce sites. It may be years, or never, before a 100-percent-secure, risk-free internet service, such as online registration, reaches its full potential. But, the same can be said about the numerous registration systems that are currently in place, and for the most part, institutions still conduct their registration and their systems are still relatively stable despite the controversies associated with registration fraud. Registration techniques and its IT infrastructure and combinations present a direct path to online registration, and constitute a logical evolution considering the popular and increasing growth of e-commerce, e-marketing, medical information, e-travel, news, and other web-enabled sources of information online. It is logical that the more educated technology users would want the opportunity to register via the internet. Many students and lectures maintain a web site to communicate their social views and to attract the educated and technologically sophisticated people. According to Bhandari (2004), there are several examples of permanent online registration lists that were developed and are regularly updated through modern technology. It is important to realize the importance of how a new registration system will affect other facets of registration processes, such as access and participation by different groups of student registration, administration and costs. In addition, the sense of saving the cost of the student in travelling to and from the institution just to register would put the credit on the technology we have today.

3.0 Methodology

3.1 Research Instruments

The proposed system is a 3-tier web-based client/server Architecture in which the user interface, functional process logic (business rules), computer data storage, and data access are developed and maintained as independent modules, most often in different platforms.
3.1.1 The Database Layer

The proposed system's database was implemented using MySQL Server 5.5.24. This layer provides high connectivity and availability, plus, it provides system developers with the ability to manage and administer their databases easily, especially using the Graphical User Interface (GUI) of its Management Studio. In addition to enabling developers to create their own stored procedures or use built-in system ones.

Figure 1: Diagram for 3-Tier Architecture design
Using MySQL Server as a Relational Database Management System (RDBMS) of the entire solution gives the user the ability to create Server-Side Cursors to iterate programmatically through different table records and manipulate them row by row. At development time, developers may need to process resulting records at the server without the need to use another programming language, i.e. by means of the built-in functionality of the RDBMS. Never forgetting the use of triggers to perform actions on data upon insertion, deletion, or updating. All of the previously mentioned features make MySQL Server a good environment to host the system’s database.

3.1.2 The Application Layer

Application Layer contains the User Interface (UI), Business Rules, and the Data-Access Components. In this system, .Net 2.0 framework is used to provide data access to the MySQL Server. All the accessing data code and business rules implementation was developed using PHP; the code was written in files, each contains a class or more to handle the operations of web forms designed using PHP.

3.1.3 The Client Layer

The simplest client must have a PC, preferably running Windows XP as an operating system, with Internet Explorer (IE) installed to enable the users to browse the website over the Internet. The code was made using Mozilla Firefox so it works very well on such browsers and the support of XML or HTML5. As a web-based application, all processing is done on behalf of the users' computers on the server hosting the system. So, other operating systems such as Linux, UNIX, Mac OS, etc. might be acceptable as client machines.

3.2 Research design

The research was conducted at Bindura University of Science Education located in Bindura Zimbabwe using the department of computer science as the sample group. Fifty students were selected randomly from the department and these students were allowed to use the system to
register online for an upcoming semester thus they had their results from previous semester migrated to the new system.

The sample group used the new system for their registration and was given questionnaire to respond to both online and offline copies were distributed as well.

3.3 Analysis of existing Bindura University manual system

The current system Inco-operated some of the following processes in its functionality:

- Paying of the money at the bank.
- Serving of students at windows to cash in receipts.
- Data capture of the details submitted by students.
- Issuing of the registration forms to the students.
- Movement of student to all relevant departments to get the form signed.
- Submission of the signed forms at the registration offices.
3.4 Proposed system design process

3.4.1 Requirements specification

System users

- Students
- Chairperson
- Faculty personnel
- Registrar
- Cashier
- System administrator

The requirements will be classified according to each user:

Figure 2: Context diagram to show the flow of data in the current system.
3.4.2 Functional requirements

Statements of services the system should provide how the system should react to particular inputs and how the system should behave in particular situations.

**Student module**

- Login - Each student would need a unique login user name and password.
- Change password - students should be able to change their passwords.
- The students should be able to input their courses for the semester.
- The students should be able to input their banking details.
- Logout – the student be able to logout his /her profile.

**Cashier module**

- Login – cashier would need a unique login user name and password.
- Change password - cashier should be able to change his / her passwords.
- The cashier should be able to view the student’s banking details.
- The cashier should be able to approve or disapprove the student’s registration.
- Logout – the student be able to logout his /her profile.

**Chairperson / faculty personnel module**

The chairperson’s main process is to approve the registration at a departmental level and should be able to see those students registered in his/her department.

The following system functions are needed for the chairperson to achieve the above:

- Login – the chairperson should also have a unique login username and password.
- Approve or disapprove the pending registrations in his/her profile.
- View the list of those registered students.
System administrator module

The system administrator keeps the system running and therefore should have more access than any other user. The administrator should be able to reset passwords and add new users to the system. To achieve this, the following system functions should be available:

- Administrator should be able to view from the back end.
- Should be able to add new users and activate/deactivate user profiles.
- Update user profiles
- Administrator should be able to reset password for users who would have forgotten their passwords.
- Should have access to all system components.
3.4.3 Data flow diagram proposed system

![Data Flow Diagram](image)

Figure 3: Data flow diagram for the proposed system

3.4.4 Requirements Analysis

3.4.5 Hardware Specifications

- 1 HP/Mac Server with the following minimum specifications
  
  1GB DDR3 RAM
  
  Intel Core i2 Processor 3.2GHz Speed
  
  1x80GB Hard disk drives.

- 1 HP Backup Server with the following minimum specifications
  
  1GB RAM
  
  Intel Core i2 Processor
  
  3.2GHz Speed
1x500GB Hard Disk drives.

- 2 HP Multiplex Desktop with the following minimum specifications
  
  1GB DDR3 RAM

  Pentium Core 2 Duo Processor

  2.4Hz Speed

  120GB Hard drive

3.4.6 Software Requirements

- Windows 2008 Server Enterprise Edition / Linux Mint 10 Julia/Mac Os X
- Windows 7 Ultimate / Windows XP Professional Edition
- Apache Web Server and MySQL
- Mozilla Firefox 6.0
- Google chrome

Most of the software required need to be purchased from the local market where it is readily available or downloading it from the internet if they are open source software. This analysis stage focuses on the requirements of the system users and clarifies what needs to be done and it mostly proves to be very crucial because the importance of the system depends wholly on how it is going to interact effectively with the users. It caters for two categories which are namely; the functional requirements and the non-functional requirements.

3.4.7 Functional Requirements

These are a set of features within the system which includes the inputs, processes, outputs and data stored for service within the system. The requirements are explained below as:

3.4.8 Inputs

The following are needed as input within the system
1. Student registration number and password.

2. The Student details which include name, next of kin address, banking details, year of study, and all student details required for registration.

3. The Registrar’s, the Faculty personnel’s details, the Cashier’s and Department chairperson’s username and password.

3.4.9 Processes

The system will be carrying out the following processes:

1. Storage of student’s details into the database.
2. Storage of the Registrar’s, the Faculty personnel’s details, the Cashier’s and Department chairperson’s details.
3. Creating audit trails and tracking all session as on logs in and out.

3.4.10 Output

1. Sending text notification and email notifications of the registration status to the student.
2. Display relevant details to the cashier, chairperson, faculty dean and the registrar.
3. Notify via text and email to the student that the registration is complete.

3.4.11 Non Functional Requirements

Listed below are the requirements expected in the system

1. The system should have a user friendly interface.
2. It should be able to curb errors.
3. Every input that requires authentication should be properly handled.
4. It should provide a relief to users that are remarkable from the old system i.e. Should greatly improve in efficiency.
5. The system should be compatible on platforms like the Microsoft windows platform and Macintosh or Linux families.
4.0 Analysis and Interpretation of Results

The results drawn from the tests were as follows for the questionnaires:

4.1 Online registration can improve the registration process efficiency.

![Figure 4: Registration process efficiency](image)

<table>
<thead>
<tr>
<th></th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>33 65%</td>
</tr>
<tr>
<td>Agree</td>
<td>12 24%</td>
</tr>
<tr>
<td>Disagree</td>
<td>6 12%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0 0%</td>
</tr>
</tbody>
</table>

![Figure 5: Graph showing registration process efficiency](image)
From the responses on the above pie chart and bar graph 65% did strongly agree on the process efficiency of the system and 24% agreed with only 12% not agreeing to it. This shows that the students support the implementation of the new system replacing the manual registration process.

4.2 The online registration system can be used in the future

![Pie chart showing responses]

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>2448%</td>
</tr>
<tr>
<td>Agree</td>
<td>1938%</td>
</tr>
<tr>
<td>Disagree</td>
<td>714%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0 0%</td>
</tr>
</tbody>
</table>

4.3 You have had no reports of difficulties in accessing the system?
Question 1
The analysis of the responses

**Question 2**

<table>
<thead>
<tr>
<th>Question</th>
<th>1 (YES)</th>
<th>0 (NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you really think using the system will remove the pressure and</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>crowding of students thereby giving more time for learning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think it is a good idea to use the system at the institution now?</td>
<td>47</td>
<td>3</td>
</tr>
</tbody>
</table>

**RATING**

| 1) This system should be implemented at the institution.                | 2       | 1      | 20     | 33     |
| 2) This system is **cost effective to the institution** to a greater    | 5       | 2      | 13     | 30     |
| extent.                                                                 |         |        |        |        |
| 3) This system is going to improve the attendance of the first lectures | 4       | 1      | 35     | 10     |
| by students to a greater extent.                                       |         |        |        |        |
| 4) This system is **cost effective to the students** to a greater extent.| 0       | 3      | 15     | 33     |
| 5) This system is user friendly and easy to use.                       | 0       | 1      | 29     | 30     |

**Figure 6:** Questionnaires results drawn from the research study
Analyzing the frequency table of the question one on whether the system should be implemented at the institution. This shows that 51.9% did strongly agree on this idea and 38.5 disagree which is a big thrust against those who did disagree standing at 3.8%.the frequency table is the response 1 below:

<table>
<thead>
<tr>
<th>response1</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>disagree</td>
<td>2</td>
<td>3.8</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>don't know</td>
<td>1</td>
<td>1.9</td>
<td>2.0</td>
<td>6.0</td>
</tr>
<tr>
<td>agree</td>
<td>20</td>
<td>38.5</td>
<td>40.0</td>
<td>46.0</td>
</tr>
<tr>
<td>strongly agree</td>
<td>27</td>
<td>51.9</td>
<td>54.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>96.2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System</td>
<td>2</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On getting the opinion for whether the system is cost effective to the institution, the ideas did really vary with 55% strongly agreeing and 25% agreeing but only 11.5% disagreed. This gave a picture on how the people really wanted a solution to save the cost .the table response2 below shows the analysis:
The other factor analyzed was whether the system would increase the attendance of the lectures at the beginning of the semester. Those who strongly agreed where only 19.2% but those who agreed stood at 67% which depicted that it is a positive hope in the stakeholders. The table below shows the results:

<table>
<thead>
<tr>
<th>response2</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid disagree</td>
<td>6</td>
<td>11.5</td>
<td>12.0</td>
<td>12.0</td>
</tr>
<tr>
<td>don't know</td>
<td>2</td>
<td>3.8</td>
<td>4.0</td>
<td>16.0</td>
</tr>
<tr>
<td>agree</td>
<td>13</td>
<td>25.0</td>
<td>26.0</td>
<td>42.0</td>
</tr>
<tr>
<td>strongly agree</td>
<td>29</td>
<td>55.8</td>
<td>58.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>96.2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing System</td>
<td>2</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Getting whether the system would be cost effective to the students the table response4 below showed that 61.5 strongly agreed and 28.8 did agree with 5.8 not having that knowledge and none could disagree on this aspect.
Finally testing whether the system was user friendly only 38.5% strongly agreed and 55.8% agreed with less than 2% not sure but still none could disagree hence the system was user friendly. The table response below shows the results:

<table>
<thead>
<tr>
<th>response4</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don't know</td>
<td>3</td>
<td>5.8</td>
<td>6.0</td>
<td>3.0</td>
</tr>
<tr>
<td>agree</td>
<td>15</td>
<td>28.8</td>
<td>30.0</td>
<td>33.0</td>
</tr>
<tr>
<td>strongly agree</td>
<td>32</td>
<td>61.5</td>
<td>64.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>96.2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>System</td>
<td>2</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.4 Summary of research findings

Based on the results collected and the analysis of those results from the study, it can be deduced that, the introduction of an online registration system will go a long way in improving efficiency of the university as a whole because a greater number of the respondents supported the idea of having registration being done online. Online registration does not only help the students in reducing the cost on their side but also helps the university authorities in improving their operations in terms of having up to date records where customized reports can be generated. In as much as this would bring about a positive change to the institution and would save a lot of resources there is also challenges that comes with having registration done online since security issues would become a priority.
The development of such a system is a step further in regard of some functionalities added to the system but there is also need to add a link of the system to the Bindura University of Science Education main website forum and also on the moodle e-learning platform so much that there is integration of the online systems within the institution. There is also need to integrate to the various banks which students use for payment of their fees so that third parties are eliminated in the verification of the financial transactions of the students.
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8. WIKIPEDIA, The Free Encyclopedia, Multitier Architecture, cited on 29th April 2009,


Appendices

The hard copy questionnaire was as below:

**B.U.S.E ONLINE REGISTRATION SURVEY**

*Please tick on the box corresponding to your response*

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you go online or use the internet.</td>
<td>A] Once a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B] Once a month</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C] Every day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you really think using this system will remove the pressure and crowding of students thereby giving more time for learning?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think it is a good idea to use the system at the institution now?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RATING</td>
<td>Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>-------</td>
<td>----------------</td>
</tr>
<tr>
<td>This system should be implemented at the institution.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This system is <strong>cost effective to the institution</strong> to a greater extent.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This system is <strong>cost effective to the students</strong> to a greater extend.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This system is going to improve the attendance of the first lectures by students to a greater extend.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This system is user friendly and easy to use.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Any recommendations to be made or your comments: ............................................................

................................................................................................................................................
The online questionnaire was as below:
If you have trouble viewing or submitting this form, you can fill it out online:
https://docs.google.com/forms/d/1UcH_N-lbnzS1Q43AsZH0vN77N6KvxuvZKo0QvyM/viewform

QUESTIONNAIRE FOR THE ONLINE REGISTRATION SYSTEM
This serves you with an evaluation platform for the online registration system you recently used....
Please feel free to put your views.

Online registration can improve the registration process efficiency.
Please click where appropriate.

- ( ) Strongly agree
- ( ) Agree
- ( ) Disagree
- ( ) Strongly Disagree

You have had no reports of difficulties in accessing the system.
Please click your response

- ( ) Strongly Agree
- ( ) Agree
- ( ) Disagree
- ( ) Strongly Disagree

The Online Registration System can be used in the future.
Please click your response

- ( ) Strongly Agree
- ( ) Agree
- ( ) Disagree
- ( ) Strongly Disagree

Registration in the past had been more difficulty and had many challenges it faced..
Please click your response

- ( ) Strongly Agree
- ( ) Agree
- ( ) Disagree
- ( ) Strongly Disagree

[Submit]
Never submit passwords through Google Forms.

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