CHANCELLOR COLLEGE



FACULTY OF SCIENCE

COMPUTER SCIENCE DEPARTMENT

**ONLINE PUBLIC UNIVERSITY APPLICATION SYSTEM**

Individual Project Report

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**INTRODUCTION**

In Malawi, there are currently four public universities, namely University of Malawi, Mzuzu University, Malawi University of Science and Technology, Lilongwe University of Agriculture and Natural Resources. Previously, for a student to study in one of these colleges, he/she had to apply for each separately. In this system, a student could incur multiple costs for each application. On the other hand, a student could be selected to more than one university. National Council of Higher Education (NCHE) was then established to harmonize the selection of students into these public universities. In this current system, students apply for each of the public university at once using the form that is produced by NCHE. These forms can either be downloaded on NCHE website or be obtained at any of the public universities. The student is then required to fill and complete the application form. Together with some necessary documents is either sent to NCHE by post or submitted by hand at NCHE offices in Lilongwe. Apart from the application fee, the process is costly. It is costly in the sense that students who would like to apply for the place in one of these universities has to at least travel posing travel costs on him/her. The traveling can either be during submission or when a student wants to get the notification of results from Malawi National Examination Board (MANEB). Most of students who apply for a place in public universities are those who just for MSCE examination, and in most cases these do not have certificates with them by the time application period is open, hence the only alternative document to attach on the application form is the notification of results slip that is obtained from MANEB. Time to time, by this time of application, notification of results are not yet ready at MANEB, hence this prompt students to travel from wherever they stay to go to MANEB and individually apply and get their notification of results slip instantly. Despite the traveling cost, this process also add small costs that includes the cost of printing the application form, in cases where the form has been downloaded from the Internet.

On the other hand, the current system has flaws on the administration side. By this, we refer to the process of sorting, organizing and reviewing these submitted application forms. Since the process is manual based, it is prone to errors, mistakes as well as biases. For instance, in 2015 a total number of 17664 students applied for a place in the public universities. This means this huge number of applications had to be organized, reviewed and then sorted per district and per program before the actual selection is done. This is hence not an ideal system as it might not produce the desirable results. After the forms have been organized, the next process is to enter them into the computer. This is also a tedious task to do, as each of the 17664 forms has to be entered into the computer, yet another process that is prone to errors and mistakes.

For a students to be satisfied with the program he/she is studying, he/she must have a basic idea of what the program is all about. Most of students apply for a program because it is famous for example without having a clue of what it is all about and what opportunities does it have. This is so because there is no proper mechanism of providing students with appropriate details and description of each programs and its requirements. Proper information is so important. Hence there should be a way of giving these students clues.

Those are some of the problems faced by the current system of public university application. In the next section a solution to these problems is defined.

**SOLUTION**

In order to solve the problems that have been identified in the current public university application system, a paperless online public university application system has been proposed. This is the system that will be used by both the students and NCHE. Students who have the qualifications will be able to apply for a place in the public university and on the other hand the system will be initialized by NCHE officers to perform selection. The system will be available on NCHE website, hence can be accessed anytime and anywhere, moreover form can be submitted anytime. By building this system, lest be assured that no extra cost will be lost on traveling to MANEB for notification of results as the system will be able to automatically retrieve student details including MSCE results from the MANEB database, hence by entering the examination number the system will give out the results. The form will also be submitted on the same platform hence there will be no need to travel to NCHE or spend extra cost of posting the form. Since the system will allow students to submit their forms online, then the task of NCHE clerks entering the form details into the computer will no longer be necessary as the applications will reach directly to them online. This also reduces cost and time. It reduces cost that NCHE will have spent on these data clerks as their salary. Time is also reduced as no unnecessary time is spent on entering these details on the computers. The system will also be able to sort and organize applications. This is done by putting the application in various districts and also in the choice of program study. To reduce biasness the system will also perform the selection process which will be initialized by the NCHE officers upon application period being closed. The selection will follow the criteria that is put in place to select student into various programs. The process will also take into account program requirement as well as program space. Since the applications are organized per district level and per program level, the selection will be easier to execute. For a student to apply for a particular program, the system will also provide the section where he/she can study different programs offered in the public universities, from which he/she can choose. This give clue to the student as to which program he/she can study.

The system do not provide a complete solution as one part will still have to be done manually. In this we refer to the process where a student has to provide a proof that he/she has paid the application fee. As for this product, a student has to provide payment information that includes, bank name, branch, depositors information. A scanned deposit slip also to be uploaded. This is a flaw since there is currently no mechanism to check the validity of the deposit slip. The deposit slip has to be verified manually by the officers on a computer. To handle this scenario, an online payment is planned to be implemented. In this case a student can use his/her bank account to send the application fee to the NCHE account so that the NCHE side should be notified of the transaction and mark the student as paid. This can be done in collaboration with the bank. By implementing this, students will no longer need to upload a scanned deposit slip.

The assumptions that have been made is that we assume the users of the system are computer literate. The users including both students and NCHE officers. The other assumption is that the product will run on servers and the system where students will be able to apply online will be accessed via the NCHE website.

**DEVELOPMENT APPROACH**

The product has been produced using an adaptive development approach. In this case the initial system prototype was developed and sent to project supervisor for comments and recommendations. Depending on the comments got from the supervisor, changes were made. We had no direct link with the client to solicit requirements. Meanwhile we contacted on Dr. Eneya the dean of Science who is also currently in the selection committee to help us on the system requirements. During development, requirements and specifications were refined as we time to time consult our supervisor. This approach was used as we did not have clear requirement and system specifications and this approach helped us gather as much requirements as possible before and during development of the system.

**Source control**

**CONTRIBUTION**

Most of the tasks in this project was done as a group. In most cases a task was performed when both the group members were around to give in comments and recommendations on how to go about with it. We were together during requirements gathering, during prototype development and also the database was designed by both of us. But my focus in this project was designing and developing the NCHE side. This is the part of the system where applications are handled and this is where the selection is performed. The task here included designing the user and system interface and also structuring the hierarchy of pages within the system. It also involved distributing roles to the system user. The roles in this case refers to what pages can be accessed by which user and which tasks can be performed by which user.

**LESSONS AND EXPERIENCE**

Through this project I have learnt a lot and acquired a lot of experience as a computer science student in almost all areas of computer science ranging from design to implementation.

I have acquires knowledge and experience in the design issues. These include Human Computer Interaction, Design model and Database design.

On HCI, much has been learnt on how to come up with a system that attracts users. The system must also consider all the potential user since the system can be accessed by difference people with different perceptions. The use of color, layout, button, forms etc are much important to consider when designing the user interface. Main lesson obtained is that do not design what it looks good to you!

I also have got enough knowledge and experience on design models, these include design class models, interaction diagrams and many other that help to structure the system well.

A best information system is the one that organizes its data sufficiently. To be able to organize this data, a system must have a concrete and well designed database. This project involved a lot of data hence database design was the core for this project. Things like Entity Relationship Diagrams (ERD) and database normalization were inevitably core tasks for this project in order to produce a very usable and reliable system. Hence through this project I have acquired proficient experience in database design and development.

The other lessons include programming, security and team work.

The project also involved much of the programming both for the client side as well as server side. Hence much of programming skills have also been acquired. The project basically involved four languages, PHP, JavaScript, HTML as well as CSS. I happen to have used all of these in this project which has given me the strong mind toward programming and system development in general. Most of problems faced gave me the opportunity to research and fix them, giving me yet other experience of problem solving technique.

The project has also equipped me with the knowledge in security. The security ranges from system controls to encryption. For a system to be reliable security plays a crucial role.

Team work is the other component I have acquired from this project. Working with different individuals and coordinating with them. For a project to produce a successful product, team spirit is required and this is what I have gained from this project. Communication forms the bond among the team members. Without communication there is no way a projects can succeed.

**RECOMMENDATIONS**

The project has been so involving, and only for two people to follow all the software development techniques and object oriented development methodology was not easy. I have noted that, in order to come up with a complete product a lot of time need to be invested into it. Therefore, I firstly recommend that the project be done by at least four people. This can ensured even distribution of tasks instead of a single person or two doing all the steps of system development. I also recommend that the project be done from the first semester of the fourth academic year. This I believe could give students enough time to plan properly before venturing into the development stage. To come up with all the system and design model require enough time. I also recommend that some courses should be taught before the project is started. A specific mention goes to Object Oriented Analysis and Design, a course that has proven to be the core in information systems projects. I recommend that this be taught prior to information systems project course and not parallel.

In order to improve the product that we have developed, much focus should go to enhancing security mechanisms. The developed system will have more of the security concern as most of students will try their luck to be admitted into any of the public universities hence they may try their way into the system. Also I recommend that this system be presented to the sole client, NCHE to review and add some functionalities or system requirements that are missing in this system.