End of Semester Evaluation System

for

Uganda Martyrs University

Developed by

Michael Mutebi

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Introduction

A web based computerized system for end of semester evaluation of staff by students was developed to replace the existing evaluation system which involved a lot of manual handling and computing of data. The system was developed with a purpose of collecting complete and correct data, aggregating it into reports and doing all this in real time.

1.1 Background

Uganda Martyrs University Quality Assurance Directorate (QAD) carries out an end of semester evaluation exercise where students evaluate their lecturers and facilities at the end of every semester as required by the National Council of Higher Education. A student is required to evaluate every lecturer that has taught them for that semester. In the previous setting, students would fill out paper forms without appending their names as the process is supposed to be as confidential. This is done in order to collect true information without the student fearing to be identified and targeted in any case. On average, each student evaluates up to seven lecturers per semester, therefore, each student is given seven evaluation forms to fill out and submit to their administrators as a requirement for sitting the end of semester examination.

The data collection process begins with faculty administrators printing out data collection forms designed by the QAD office, handing them to the students for evaluation and receiving them after the evaluation form is filled out. The forms are then collected and sent to the QAD where the data processing begins. The data collected is transcribed from the paper forms to a data analysis program like SPSS or Excel and data aggregation is done. From the data generated, A report is generated using Microsoft Word and finally converted to PDF for storage and distribution to the necessary departments. This is done for every course unit taught in the semester.

1.2 Existing Problem

This manual system of capturing and processing data has been in use since the evaluation exercise started at the university. Initially with smaller numbers of students and staff, the manual process was practical, but as the university grew and the numbers increased, issues with data handling started to developed that rendered the data inaccurate and therefore defeating the purpose of the evaluation process.

The increase in the number of students without a corresponding increase in the number of staff lead to few staff having to handle very large amounts of data and yet the reporting time, which is per semester remains the same. This resulted in late and at times inaccurate reports due to human error resulting from huge amounts of data to work with.

Lack of confidentiality also added to the inaccuracy of the reports, say, for instance, a student had to hand in their forms to the administrators in order to get clearance to sit for their exam, and the student cannot be sure that the administrator will not read through their form and take note of how they have evaluated, so the student will not fill out the form the way they would have if they knew no body would trace their comment back to them. So, we end up getting inaccurate data which is used for evaluating lecturers and facilities.

This system also had costs that increase each time the student lecturer population increased whereby the university had to buy paper and print for the many evaluation forms per student.

1.3 Objective

The university incurs high costs in paying utility bills of electricity and Internet. It also spends lots of money stocking faculty labs, and the library with computers and paying IT staff who maintain an IT infrastructure with wired and wireless network. It is also worth noting that most students now have personal laptops, and smart phones. With all these resources available it made sense to utilize the electricity, Internet and the IT infrastructure in order to do away with the extra costs of paper and inefficiency of manual procedures. With regard to the end of semester evaluation process, a system that collects information submitted by students with close to 100% anonymity, aggregates the data collected making reports in a split second would solve these existing problems.

1.4 Specific objectives

After understanding the existing problems, there was a need to translate the existing manual evaluation procedures into a computerized evaluation process that utilizes the existing resources.

- Design and implement the system
- Test the system, first with seeded data to verify that the system is functional
- Deploy the system
- Provide user training
- Test the system with a pilot evaluation to ensure that the requirements were met and to refine the requirements to better meet the objective.
- Provide system support

1.5 Scope

The system was developed for the end of semester evaluation procedure for Uganda Martyrs University including all its branches country wide. It was meant to translate the existing end of semester evaluation process into a computerized system that will generate the existing reports using a fully computerized collection and data aggregation and reporting system.

Design and Implementation

The system, is a web-based system was written using the following languages:

PHP is the main application was developed using the PHP programming language. This is a server-side scripting language which revives requests from client terminals, makes requests from the database and delivers information to the client terminals. It runs on a server and is access by a client over the network. The PHP implements a lose MVC infrastructure.

MySQL is the database management system used for hold the and serve information to the main application program. It is a free and open-source database solution.

HTML and CSS, are the main display languages used for this application. HTML is used to define the web interface whereas CSS is used to style the web interface.

JavaScript is an application language that adds interactivity to the client side. It is used a little in this project

The system is hosted locally in the UMU Nkozi Server room on an Ubuntu 14.04 Server machine running apache web server software.

2.1 Functional requirements

- Generate semester evaluation form
- Enter programs/courses
- Register users (students)
- Provide authenticated access (students/staff)
- Edit user profile data and passwords
- Select course units for evaluation and evaluate
- Generate reports on student status of completion
- Generate reports for each course unit taught from the data collected
- Backing up of data for each semester

2.2 Non-functional requirements

- Users access the system using a web browser with input validation that ensures only the correct/expected data is entered.
- Provide an easy way for users to select their course units/programs with the corresponding lecturer (auto-suggest)
- Ensure that the evaluation form is filled completely before submitting
- Provide the student feedback when evaluation is done (disable evaluated course units)

2.3 System requirements

2.3.1 Database

MySQL version 5.5 Database Management System is used to create and manage the database. This database contains information that is shared by both the existing Library portal and the End of Semester Evaluation system, like staff, Faculties and Schools, course, course/programs. This sharing of information minimizes that effort of entering the same information twice and reduces of data integrity issues that result from duplication of data for the same users.

2.3.2 Sever side

The server runs PHP Version 5.5 sever side programming language and the scripts are written using Object oriented PHP using a lose MVC application development infrastructure

2.3.3 Client side

On the client side, the system relies on HTML for markup, CSS for design and JavaScript for client-side programming.

Testing and validating the system

The system development was concluded in April 2016 and system testing with dummy data was carried out with Quality Assurance staff to further refine the requirements and fix errors that existed.

In December 2016, the system was implemented in a pilot test using the Faculty of Business Administration and Management and the Faculty of Education. The system proved to work as expected, but still some issues of scalability were identified. More work was done to improve on usability and speed especially in the reporting process.

Deployment

In April 2017, the system was fully deployed and close to 1000 students (all students at the main campus) used the system to evaluate successfully.

It is currently available at the URL: https://qa.umu.ac.ug/

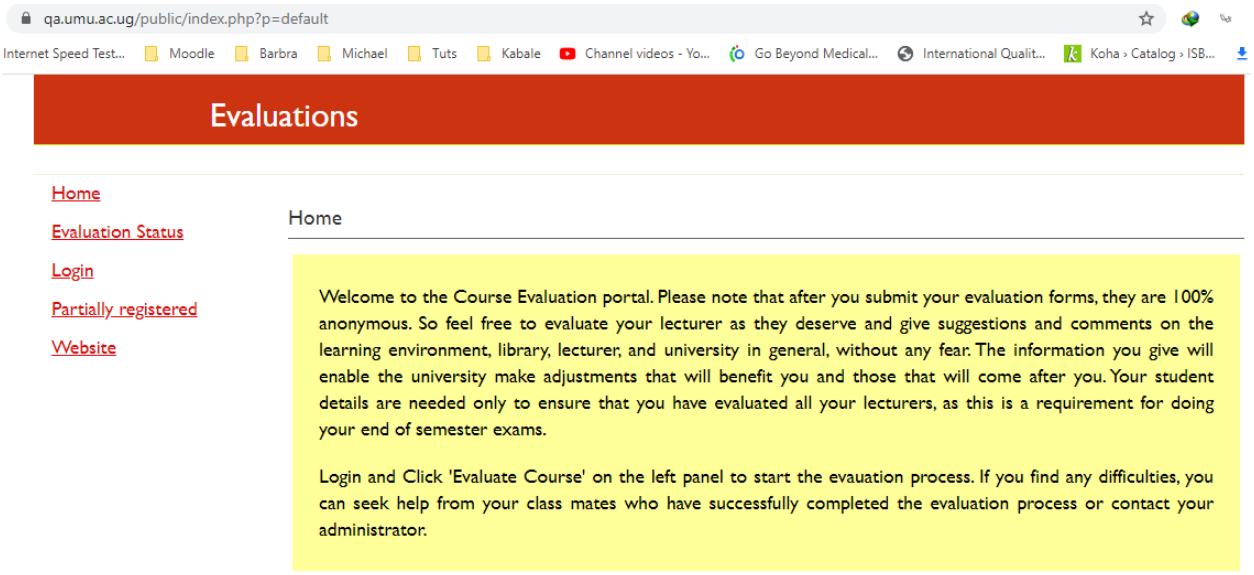

Figure 1: The home page for the end of semester evaluation system

Further improvements were made to the system like:

Improvement of the report format and quality

- Optimization of speeds as a result of latency which resulted in a higher number of concurrent users.
- Improvement in the feedback given to users after evaluation
- Improving on the input forms and input validation to make data entry easier, more painless and more accurate.

Evaluations

Staff: Mutebi Michael | (Logou

Theories and Practice of Educational Administration and Management: Mr. [redacted]

Program:	Master of Education Distance Learning/Evening/Part Time (Year 2) Rubaga		
Course Unit:	**Theories and Practice of Educational Administration and Management**	**Lecturer's/Facilitator's Name:**	Mr.Tebaese Christopher
Faculty/Institute/School:	Faculty of Education	**Academic year-Semester:**	20[redacted]/20[redacted]-Sem I
Department:	Faculty of Education	**Date:**	20[redacted]-[redacted]-25 03:59:48 PM

Instructor office hours are available (online)

	Frequency	Percentage
Average/Good	1	
Very Good	3	
Excellent	4	
Total	**8**	

Required textbooks and other course materials are listed

	Frequency	Percentage
Average/Good	1	
Very Good	1	
Excellent	6	
Total	**8**	

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	A	B	C	D
2	Faculty:	Faculty of Education	Semester:	1
3	Lecturer:	Mr.	Class & Year:	Master of Education (year 2) Rubaga
4	Academic Year:	20[redacted]/20[redacted]	Program:	Distance Learning/Evening/Part Time
5	Date:	20[redacted]-[redacted]-25 04:02:43 PM	Course Unit:	Theories and Practice of Educational Administration and Manageme
6				
7	Instructor office hours are available (online)			
8			Frequency	Percentage
9		Average/Good	1	
10		Very Good	3	
11		Excellent	4	
12		Total	8	
13	Required textbooks and other course materials are listed			
14			Frequency	Percentage
15		Average/Good	1	
16		Very Good	1	
17		Excellent	6	
18		Total	8	
19	The purpose of the course is clearly stated			
20			Frequency	Percentage
21		Very Good	2	

Figure 2: Sample Excel report for a lecturer

Figure 3:Sample online evaluation report

4.1 User training

User training was carried out during the beginning of the testing phases all through to deployment. The QAD staff were taught:

- how to enter the time tables,
- How to generate reports.
- They were taught how to use the system as students such that they could train the students

Student were taught how to:

- Access the system, register and login
- How to pick their courses and lecturers
- How to evaluate and logout of the system
- How to interpret the feedback from the system
- How to contact the QAD staff and get help

It was realized during the training that the system was easy for the students to understand and use. Systems for user assistance were put in place and the evaluation exercise was carried out successfully.

Currently the system is set to be used in Masaka and Lubaga campuses and students have been trained on using the system.

4.2 System support

4.3 Support

System support was provided from the point of deployment in April 2017 to September 2017 when the system management was handed over to the QAD. System support will continue in case there is a system failure provided there is no system modification made to the software or database by another developer that the current developer is not aware of.

4.4 Further developments

Almost always, when a system is deployed and is in use, the user begins to realize improvements that can be made. Any improvements that will be required by this developer after the point of handing over the system will involve a new understanding between the developer and the customer.

Conclusion

The End of semester evaluation system was successfully designed, implemented, tested and deployed. All the problems it was meant to solve have all been solved and it is my firm belief that this system can operate in this state for up to 3000 users. More fine tuning can be done to expand that capacity but this requires gaining more knowledge of the technologies involved and purchase of higher capacity systems that support extremely high numbers of user.

The software that I have written is available to Uganda Martyrs University to edit and develop further If they choose. I have given the QAD a copy of the source code, and the database.

I am grateful for the opportunity that has been given to me as the developer of this system. Thank you.

Report By

Michael Mutebi

Systems Librarian, Uganda Martyrs University, October 2017