AN ARCHITECTURE PROPOSAL FOR TEACHERS' CONTINUAL FEEDBACK COLLECTION IN ETHIOPIAN UNIVERSITIES

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ABSTRACT: In this paper, web based architecture is introduced which is used for the collection of continual feedback for teachers' from students, teacher's colleagues and from supervisor or head of the department (HoD). The system is intended for performance evaluation of academic staffs in which students, colleagues and supervisors can provide their feedback regularly to the teachers to debate and to comment on overall classroom performance and students' improvement, to discuss about professional goals and developmental needs, and about the facilities that leaders will deliver to attain quality of education in the universities. In almost all universities of Ethiopia, teachers are evaluated only at the end of each semester of an academic year through paper-based system in which the final result of the evaluation process is trivial in improving the performance of teachers. The paper-based teachers' performance evaluation is discussed and identified difficulties those are associated with it. And also the proposed system is compared with the existing one in terms of cost feasibility, processing time and the quality of evaluation.

Keywords: anonymous, continual feedback, performance evaluation, staff development program.

I.   INTRODUCTION

Teachers are the main role takers of any academic institution in the provision of quality education to the students and they are often supposed to be responsible for the teaching learning process, within the limitations of the students' competences, time and the necessary resources obtainability. Teachers' performance evaluation is a crucial mechanism in making sure of good and quality of education. In academic institutions, teachers' performance evaluation result is used as a tool to describe teachers on how they are undertaking their profession. Performance is stated as a set of results produced throughout a certain period of time, and it does not represent to the qualities, personal characteristics or competencies of the performer and evaluating the performance is intended to recognize the strengths and weaknesses of the performer [1]. Teachers' evaluation is usually understood to be the most efficient instrument to increase the quality of education in universities [2]. Pertinent and truthful information is useful in nearly at every stages of the decision-making process. Problems are identified when information discloses that some part of performance is less than required. The timely, truthful and valuable performance evaluation result can be offered to the decision-makers; the timely problems can be corrected, decreasing the possibly unwanted or pricey costs to the organization [3].

This research project is proposed to crossover the manual performance evaluation system and to move towards web based continual feedback provider mechanism on the way to improve competence and staff performance for attaining the university's teaching and research goals. It will provide a platform for the university to better administer teachers' performance evaluation and in managing the users (academic staffs and students) based on their roles and responsibility. Currently, the means of teachers' performance evaluation in the university is done by giving one of five ratings based on evaluation criteria those are printed out on a paper at the end of each semester of an academic year: for example, the ratings are "Very Low", "Low", "Average", "High" or "Very High". All teachers are evaluated based on 20(twenty) different criteria by students which they are teaching, their colleagues and by their immediate supervisors. The ratings in each evaluation criteria from each category of staffs and students will combine to yield evaluation result for 100% towards each teacher.

However, this way of teachers' performance evaluation is ineffective and unsuccessful in supporting teachers to identify their drawbacks and to make improvement on it and due to the vagueness of the evaluation result it will not help the leaders to find effective teachers and to recognize them and to prepare staff development program for those who are less effective. Web based continual feedback provider system is implemented to allow academic staffs to get continual feedback from their HoD, peer/colleague, and from their students anonymously in order to assess their

overall performance and the system will provide user friendly graphical user interface for giving and receiving feedback and inclusive evaluation reports to specific teacher and to the HoD a semester and annual wise.

II.   LITERATURE REVIEW

Kasiar JB et al. [4]. Have compared the paper based evaluation process with web based evaluation system in a study containing of 169 students. 50 students were randomly selected to finish evaluation process the same criteria online, and the other 119 students finished their evaluation on paper. The results of the study discovered: (1) students who evaluated online provided more comments, in addition the number of words entered per each student via the web based system was more than 7 times with that of student via the manual system; (2) students expended nearly 10 minutes or fewer for evaluation using web based system where as 25 minutes using paper based evaluation; besides (3) the amount of workload for staffs reduced from around 30 hours consumed collecting and calculating ratings from the paper based evaluation to approximately 1 hour for copying results and comments from the web based evaluation system.

Dommeyer CJ et al. [5]. Student commentaries incorporated in instructor evaluations have a great advantage to the instructor and to the university. The crucial factor is a web based evaluations rise to yield more typed comments than paper based evaluations. Students who choose web based instructor evaluations also footnotes the capability to prompt themselves more comprehensively by typing rather than lettering information on paper based evaluations on paper form as they have the chance to pull together their opinions before start keyboarding their comments.

Ravelli B. [6]. Has revealed that anonymity is a significant stimulus for online course evaluation as handwritten comments on paper based course evaluations system may recognize the student, linking specific students to the given comments. But when typing comments online, the diagnosing of handwriting is no longer an issue. Students who has evaluated using web based evaluation system feel more anonymous and they consider that web based evaluation system endorsed them to provide more thoughtful feedbacks and comments than did the paper-based teaching evaluation system.

McKone K.E. [7] suggested that instructors offer for continuing feedback from students all the way through the semester. This will help instructors to improve their teaching practice. Hence, the implementation of regular constructive instructor evaluations throughout the semester will also benefit students directly and provides for enhancement of the course over the semester. Goltzbach et al. [8]. They have developed a web based application for online instructor evaluation using ASP.Net and Microsoft SQL Server Database. And also, they have delivered supplementary functionalities such as charting and graphing in the system. In conclusion, a number of researchers have pointed that it is crucial for teachers to be evaluated and to get continual feedback from students and from their colleagues on their performance to support them to identify how to better enhance and advance their teaching practice [11]. For the evaluation process they have compared and contrasted the paper based evaluation approach with web based evaluation system and pointed out the advantages and the disadvantages of both approaches [15]. In this paper I have proposed to develop web based continual feedback provider system that can allow students to assess the performance of their teachers while still the course is going on and throughout the semester instead of waiting for end of semester evaluation.

III.   PROBLEM STATEMENT

In recent times the demand for better responsibility and enhancement in the quality of education has come to be a main concern in educational institutions in Ethiopia. The necessity of quality, on time and significant information for the endowment of decision-making process continues to pose a great challenge to many academic managers. In many circumstances, evaluations of instructors teaching and research performance has been taken as a crucial source of facts about the quality of teaching and learning process and most universities are gathering and examining teachers' evaluation data by distributing paper forms which contains evaluation criteria to students and staffs once at the end of each semester. Paper evaluation forms are collected and calculated by the departmental committee to provide the numeric value that represents the teaching performance of each instructors to the head of the department and other higher officials for the use of decision-making purpose, including promotion. The paper-based process is labor demanding, requiring significant staff time and resources to manually tabularize numerical ratings and qualitative commentaries and feedbacks. Duplication of evaluation papers and calculation of evaluation results will become very extensive when the number of students and academic staffs increase in the universities. Instructors often waits for several weeks or months to see the reports of the final evaluation results.
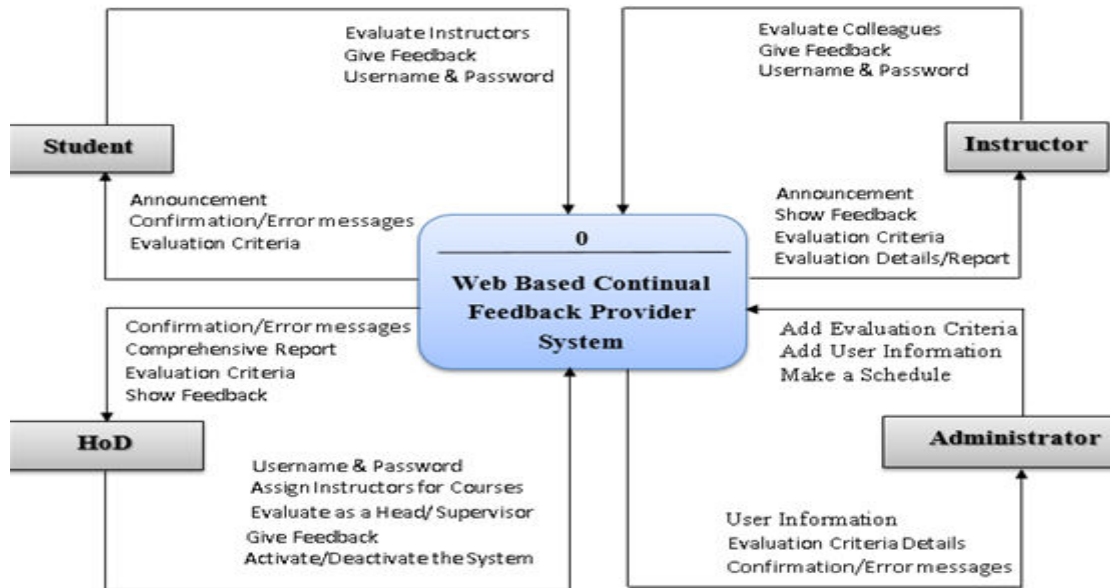
IV.   PROPOSED SOLUTION

The solution for the problems stated under problem statement is to develop a web-based continual feedback provider system which is intended to allow the students to evaluate their respective instructors and to provide continuous feedback anonymously at anytime and anywhere in the university, and also instructors can access their own evaluation report and the feedbacks that he/she has got from students and from his/her colleagues using their own user account. The proposed system will generate general report for head of the department so that he/she can come to know the status of instructors those are found in his/her respective department.

The web based continual feedback provider system will increase the degree of response of the academic staffs and students to the evaluation process by:

- Sending announcement for evaluation schedule on the home page of the system.
- Providing important information about the significance of evaluation.
- Providing directions and ways to show the students how to evaluate their teachers using the web based system.
- Making the system accessible with their own smartphones.
- Providing simple to use and interactive user interfaces.

The core advantage of the web based continual feedback provider system is to produce quick reports in a simple way to the instructors and head of department to understand the degree of achievement or failure of the teaching learning processes, and also to know the strong points and weak points for the determination of growth and enhancement in educational system. The contextual data flow diagram of web based continual feedback provider system as shown in fig. 1 networks with 4 users: students, instructors, head of the department and the administrator of the system.

Fig. 1: Data Flow level 0 diagram of the proposed system
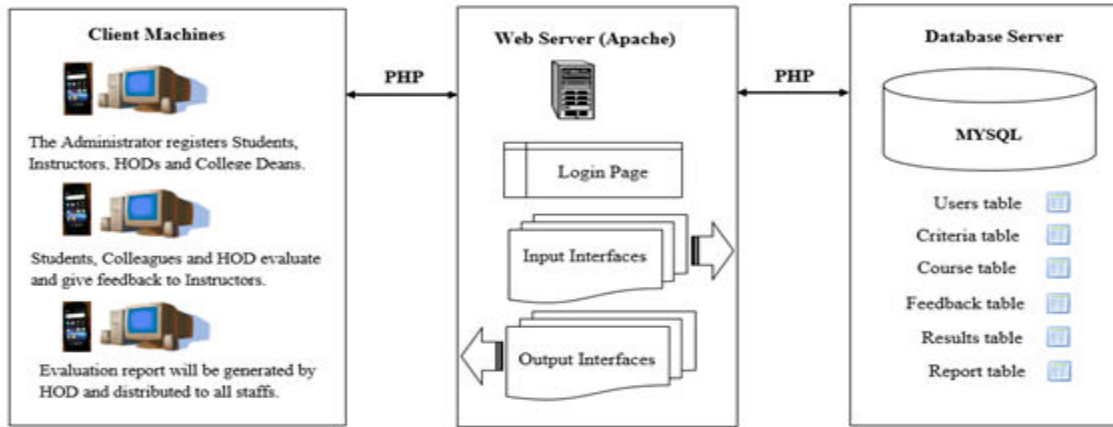

V.   METHODOLOGY

The methodology of this study has two parts, reviewing of the existing system and development of the newly proposed solution. As almost all universities in Ethiopia are handling teachers' performance evaluation by using paper-based system, I have observed the way how the ratings of instructors are being processed by means of paper-based system and how much time and finance is consuming to finish the evaluation process per each semester of an academic year. I made conversations with students and instructors of Bule Hora university of Ethiopia to figure out:

- What is their reflection about the existing evaluation system?
- What are the difficulties they have faced with existing evaluation system?
- What are their recommendations on the automation of the existing system?

HTML programming, bootstrap and java script are used to project the necessary input and output graphical user interfaces and script programs are written in PHP that will execute at the WWW server that will display web forms

using the information kept in the database server, that is MYSQL database management system which will used as the back-end database engine. While students or instructors initiate the system for evaluation, the web forms will be displayed on client's browser and after they finish the evaluation the result of their evaluation will be stored in the database. The interaction among the client's machine with WWW server and WWW server with the database server will be done by using PHP scripts as shown in fig. 2.

Fig. 2: System Architecture

VI.   IMPLEMENTATION

The newly proposed system will be menu driven and it will give directional information and error messages to assist the users in accessing several features of the system. All of the users of the system need to have username and password in order to login into and access the system and the system will provide an option to change their username and password. The system will allow students to evaluate and to give feedback to instructors and the result of the evaluation will be saved to the database, and also it will allow instructors and head of the department to view and to print out evaluation reports. The administrator of the system will register users and evaluation criteria in different languages. The site structure of the proposed system is as shown in fig. 3.
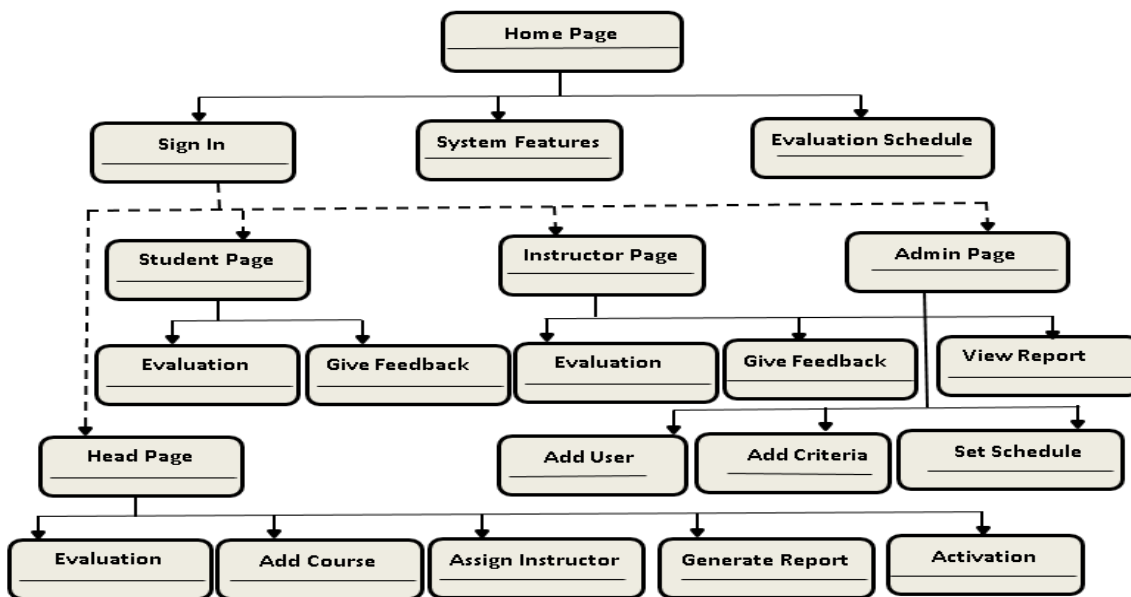

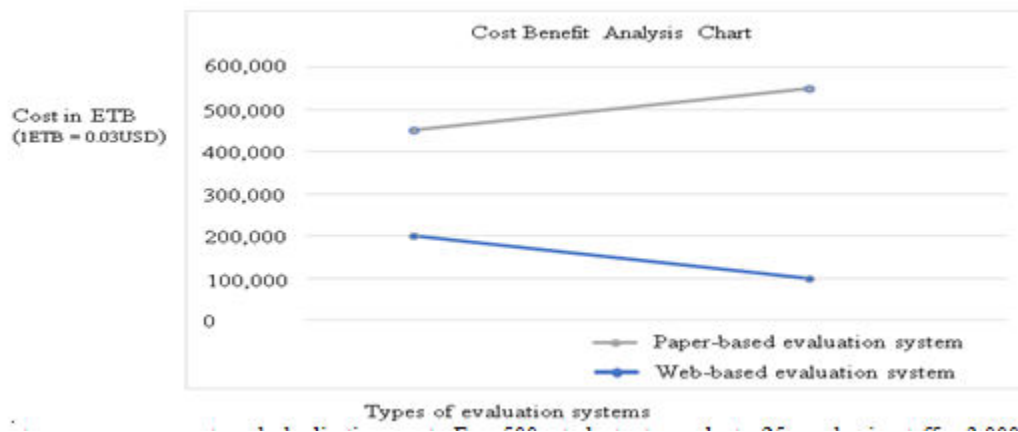**Fig. 3: The site structure of the proposed system**

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VII.   RESULTS AND DISCUSSION

In this study I performed the analysis of the two methods of teachers' evaluation system in terms of cost, processing time and the quality of the evaluation. The data is taken from one of the departments in Bule Hora University of Ethiopia. In the department there are 500 students in a regular program from 1st year to 5th year and there are 25 academic staffs those are delivering different courses to the students in each semester of an academic year. The evaluation is collected from each student for each academic staff per each semester. And each staff is evaluated by all of the staffs in the department as a colleague evaluation result. And all of the staffs are evaluated by the HoD as supervisor evaluation result.

Cost

The cost associated with web-based teachers' evaluation system are training and implementation which are one-time cost and ongoing maintenance and support cost. Whereas the cost associated with paper-based teachers' evaluation system are paper cost and duplication cost. For 500 students to evaluate 25 academic staffs, 3,000 papers are required as a student will evaluate at least 6 staffs in a semester, and for 25 academic staffs to evaluate each other, 600 papers are required and for HoD to evaluate 24 staffs excluding himself, 24 papers are required. Which means at least 3,624 papers are required for a single department in a single semester, i.e. the cost for paper is calculated as 1,449.6 Ethiopian Birr (ETB), as the cost of a paper is 0.4 cents. As one cartridge is used to duplicate 2,500 papers, 2 cartridges are required for the department, i.e. the cost of duplication of evaluation form is calculated as 2,000ETB, as a cost of a cartridge is 1,000ETB. The total cost evaluation for a single department in a semester is 3,449.6ETB and the cost of evaluation for one academic year or for two semesters will be 6,899.2ETB. The cost benefit analysis of the two types of teachers' evaluation system in an academic year for 60 departments with some difference in students' number is shown below in fig. 4.

Fig. 4: Cost benefit analysis of the proposed system

Processing time

Twenty students are selected to fill the evaluation form, ten of them have filled on paper-based evaluation system and the others have completed the evaluation on the web-based evaluation system. The students have started the evaluation at the same time and completed their evaluation in almost at the same time. However, the time required for the duplication of evaluation forms for 500 students and 25 academic staff will be calculated as: if a printer can copy 30 pages per minute, 2.01 hrs. will be required to duplicate 3,624 pages for a single department in a semester. And to calculate and to prepare evaluation report for each academic staff 5 committee members will participate and they have to add the ratings which found on each evaluation form. To add the ratings in a single evaluation form, it will take approximately 2 minutes, i.e. to process the evaluation report for each academic staff, each committee member must work for 24.16 hrs. In general, about 26.17 hrs. are required to process out teachers' evaluation in

paper-based system whereas time for activation, approval and generating report is required to process out teachers' evaluation in the case of web-based teachers' evaluation system.
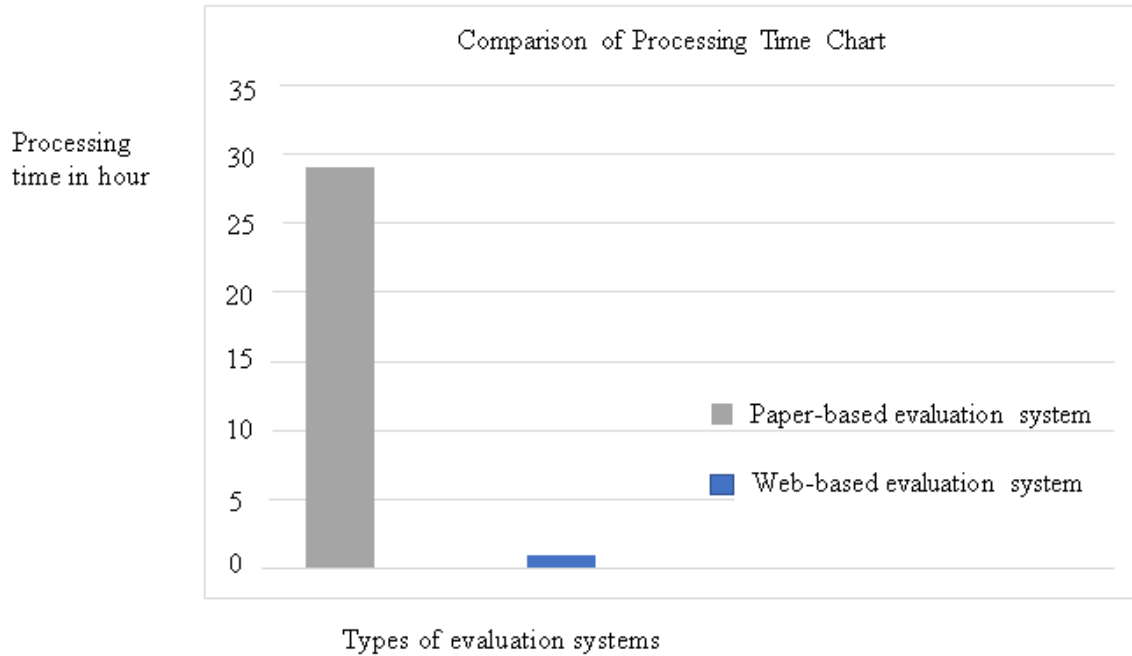

Fig. 5: Comparison of processing time for the two types of systems

As the number of students joining universities are increasing in every year, the cost and processing time of paper-based evaluation system will increase due to the cost for paper and duplication and the number of students and academic staffs increase.

Quality of the evaluation

In the case of paper-based evaluation method, the evaluation process is going on only at the end of the semester before final examination has started through the criterion which are given by two languages. i.e. English & Amharic. And students are rating their instructors without properly reading each evaluation criteria and without understanding the meaning of it. Whereas in the case of web-based evaluation system, since it can be accessible by desktops, laptops and smartphones, the evaluation can be conducted anytime and anywhere in the university once the HoD has activated the system and students can evaluate their instructors through the criterion which are developed by three languages. i.e. English, Amharic & Afan Oromo. And students can provide continual feedback to their instructors during teaching learning process so that instructors can enhance their way of teaching based on the feedbacks. Since students are evaluating their instructors by their own time and by their own device, they will have sufficient time to read each evaluation criteria without any pressure and to understand it properly so the quality of the evaluation will increase if it is completed through web-based evaluation system.

VIII.   CONCLUSION AND FUTURE WORK

The evaluation process which done only at the end each semester of an academic year through paper-based system is labor demanding, requiring significant staff time and resources to manually tabularize numerical ratings and qualitative commentaries and feedbacks and the final result of the evaluation process is trivial in improving the performance of teachers. Providing continuous feedback and evaluation to instructors' is recommended in order to enhance quality of education in higher educational institutions. Web based continual feedback provider system is important for performance evaluation of academic staffs in which students, colleagues and supervisors or HoD can provide their feedback regularly to instructors to debate and to comment on overall classroom performance and

students' improvement, to discuss about professional goals and developmental needs, and about the facilities that leaders will deliver to attain quality of education in the university. The automated system will allow students, colleagues and HoD to evaluate instructors, it will provide different reports to instructors about their own evaluation result and feedbacks which is given from students and colleagues, and also it will give comprehensive reports to HoD about all of the instructors those are found in his/her respective department.

The future focus of this paper will be to apply fuzzy expert system for qualitative facts evaluation of university instructors by taking some key performance attributes and those attributes will be associated with numeric values.

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