Advancing Pre-Enrollment Procedure through Online Registration and Grade Evaluation System

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Abstract—**Online processing is one of the many advantages of the use of internet technology. Enrollment procedures in many universities not only in the Philippines usually done in manual process even with the advent of internet and with many sophisticated technologies. The purpose of this study is to design and develop an Online Registration and Grade Evaluation System in advancing the Pre-Enrollment Procedure. The system can help improve student's registration, grade evaluation and record keeping system of Bulacan State University, one of the Universities in the Philippines. The system can provide online registration of students, viewing of grades through their personal account, creation of subjects and curriculum, managing of different user accounts for faculty members and students, online evaluation of grades using the subject pre-requisite system and printing of evaluation certificates and grade checklist of the students. The developed system can help the different Colleges of the University in terms of their enrollment procedure which can minimize inaccuracies and errors.**

Index Terms—**online registration and grade evaluation system, enrollment system, pre-enrollment, online grade evaluation system**

I. INTRODUCTION

Technology has put down the barrier and has bridged the gap that hinders the communication among people. Computers are now marked as one of the leading innovations an educational institution should have.

As technology developed through the years, computers are no longer use just for computing but also in communicating and disseminating important information. People have never been satisfied with the way they are living at present, which leads them to keep on searching for modern ways to make the work much easier and faster.

These technologies are more central for many colleges and universities; the changing technology landscape together with data reporting demands has compelled colleges and universities to evaluate their major software systems [1]. It is believed that online system is a clear improvement over paper-based [2].

With younger generation having grown up with technology, students now expect to get information and do business with colleges and universities on the web [1]. Ease and convenience on the part of the students is essential for many universities and believing that the student services on the web play a major part in this. The internet and other related technologies have changed the way businesses operate and people work, and how information systems support businesses processes, decision making competitive advantage. Like when the enrollment processing will be done online that even international students can inquire and enroll through internet without traveling [3], which makes the institution competitive.

Through the inter-connectivity of computer across the world, nearly anyone and anything is a just seconds away. Everything is now cyber-connected like communication, business, education, entertainment, health and other sectors of the society are being influenced by the use of the internet.

Higher Education Institutions envision itself not only on excellence in producing globally competitive graduates [4], but also to ensure that they are ready to respond to the changing needs of the society [5]. In Bulacan State University, the College of Information and Communications Technology (CICT) reached its status as one of the largest colleges in the university resulting to difficulty in its pre-enrollment process. Even if the College is using a LAN-based enrollment system, limited numbers of computers are being used to cater the enrollment of many students which slows the enrollment procedure from registration to grade evaluation.

The proponents designed this Online Registration and Evaluation System for the different programs of the University. Not all Colleges are using a LAN-based enrollment system and most of them perform the enrollment process manually. The proponents believed that the Internet can provide an effective and efficient way of enrollment system faster.

II. GENERAL OBJECTIVE

The main objective of the study is to develop an Online Registration and Grade Evaluation System: A Web-based Pre-Enrollment Procedure" that will make the pre-enrollment registration and grade evaluation procedure could be done online.

A. Specific Objectives

In order to develop the said system, specific objectives were considered:
- To develop a system that can perform functionalities like:

➢ Online registration for freshmen students;
➢ Viewing of student grades through their personal account;
➢ Manual encoding and batch uploading of student list;
➢ Creation of subjects and curriculum different courses;
➢ Online evaluation of grades using the subject prerequisite system and
➢ Printing of certificate of evaluation, subject checklist, and temporary certificate of grades.
- To identify the information requirements in the existing system.
- To identify the problems encountered using the existing system.
- To determine the level of acceptability of the system in terms of the following criterions:
  ➢ Functionality;
  ➢ Reliability;
  ➢ Usability;
  ➢ Maintainability;
  ➢ Portability; and
  ➢ Training and documentation.

III. SCOPE OF THE PROJECT

The proponents developed an "Online Registration and Grade Evaluation System in advancing the Pre-Enrollment Registration Procedure". In this study, the proponents asked the permission of the College of Information and Communications Technology (CICT) at Bulacan State University (BulSU) to develop the system for their programs Bachelor of Science in Information Technology (BSIT) and Bachelor in Industrial Technology major in Computer Technology for preliminary testing of the website.

Pre-enrollment registration procedure for the incoming freshmen and grade evaluation are the major function of this project where the student can register and access their account online using their desired username and password. Once they are logged into their account, they can now view their grades within the current semester through the online checklist in the system.

The system can evaluate the student and automatically shows the subjects that they can enroll for the next semester. The student can print the evaluation form and have the faculty evaluators check the subjects printed on the evaluation form. Once all the information had been checked, that's the time the adviser (faculty evaluator) signs the evaluation form needed for the tuition fee assessment. If the student was not able to print the evaluation form, the faculty evaluators will print the form upon evaluation.

The developed system has three accounts, one for the administrator, the faculty members (faculty evaluators), and the student. The administrator will handle the creation and updating of the curriculum, and the management of the accounts for the faculty and the students. The faculty, on the other hand, is the one who will input the grades and the list of the students that can

register into their online accounts. Lastly, students have limited capabilities like managing their personal accounts and viewing of their grade records only.

IV. SIGNIFICANCE OF THE PROJECT

Technology has been making enormous progress. And the Internet has given us the opportunity to connect to any place in the world, to share or get information in only a few minutes [6] like school registration and enrollment.

With the development of the Online Registration and Grade Evaluation System for pre-enrollment procedure, the University will further promote its vision, mission statement and goals of contributing to the development of the society.

The *College* will have an accurate and systematic student records and grade evaluation procedure managed by the faculty members as the evaluators.

Faculty members may use the online evaluation system in recording and monitoring of student grades that will be used in evaluation process which can be done online.

The *students* will have an easy access in viewing their academic records like their grade evaluation and will be able to the subjects that they may or may not be taken for the next semester.

In this way, an easier and more convenient way of accessing information and evaluation transactions could be done without sacrificing much on the cost means, time delay and security. The use of the Internet in the educational environment has enabled easy access to many resources, and information sharing has, therefore, significantly increased [7].

And lastly for *future researchers*, this study can be used as reference related to their research topic.

V. PROJECT METHODOLOGY

The *Systems Development Life Cycle (SDLC)* is a set of activities developer use to build an information system, is the overall process of developing, implementing, and retiring information systems through a multistep process from initiation, analysis, design, implementation, and maintenance to disposal [8]. SDLC is a model of a detailed plan on how to develop and implement the software. It is said that SDLC is a complete plan outlining how the software will start and end from its function.

One of its development models is the *Agile model.* Agile SDLC model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product [9].

In using Agile model, it is believed that every project needs to be handled differently and the existing methods need to be tailored to best suit the project requirements. In agile the tasks are divided to time boxes (small time frames) to deliver specific features for a release. It has five phases from planning, requirement analysis, designing, building and testing. Iterative approach is taken and working software build is delivered after each iteration. Each build is incremental in terms of features; the final build holds all the features required by the client.

VI. CONCEPTUAL FRAMEWORK

The conceptual framework is the set of coherent ideas or concepts organized in a systematic manner in which this study was based on. It is an organized way of thinking about how the proponents understand its activities using the Input, Process and Output framework as shown in Fig. 1.
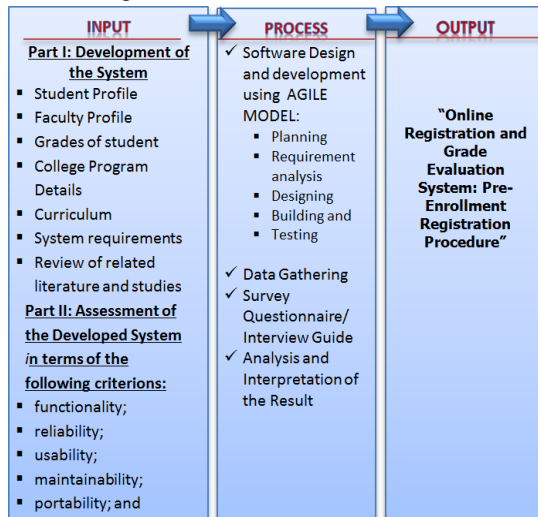

Figure 1. Input process output model

The *input frame* contains all the necessary information and resources needed in developing the system. Data was gathered concerning the profile of the students, faculty members and the College curriculums and programs. Different criterions in determining the level of acceptability were also included like: functionality; reliability; usability; maintainability; portability; and training and documentation.

The *process frame* is the activities in which the proponents undergo in developing the system using an Agile Model. And lastly, the *output frame* is the outcome "Online Registration and Grade Evaluation System" in advancing the Pre-Enrollment Registration Procedure at Bulacan State University which aims to contribute and provide useful and efficient way of pre-enrollment system for the College.

VII. SOFTWARE ARCHITECTURE

Fig. 2 presents the Use case diagram of the online registration of grades.

Three actors play an important role in the system. The first is the *Student.* Faculty adviser will give the default Username and Password to the officially enrolled student in order to *Register* into the system. In this account, the student can customize the avatar by uploading new picture and can edit the personal information.

Username and Password can also be changed by the student. *Faculty member* will be the *evaluator* of grades and will encode the grades into the system. After encoding and updating the record of the student, evaluation certificate, temporary transcript of record and grade checklist can be printed and issued to the student.

The *Admin* on the other hand is the one who can create an account for faculty member/s and can customize the

content of the online registration and grade evaluation system.

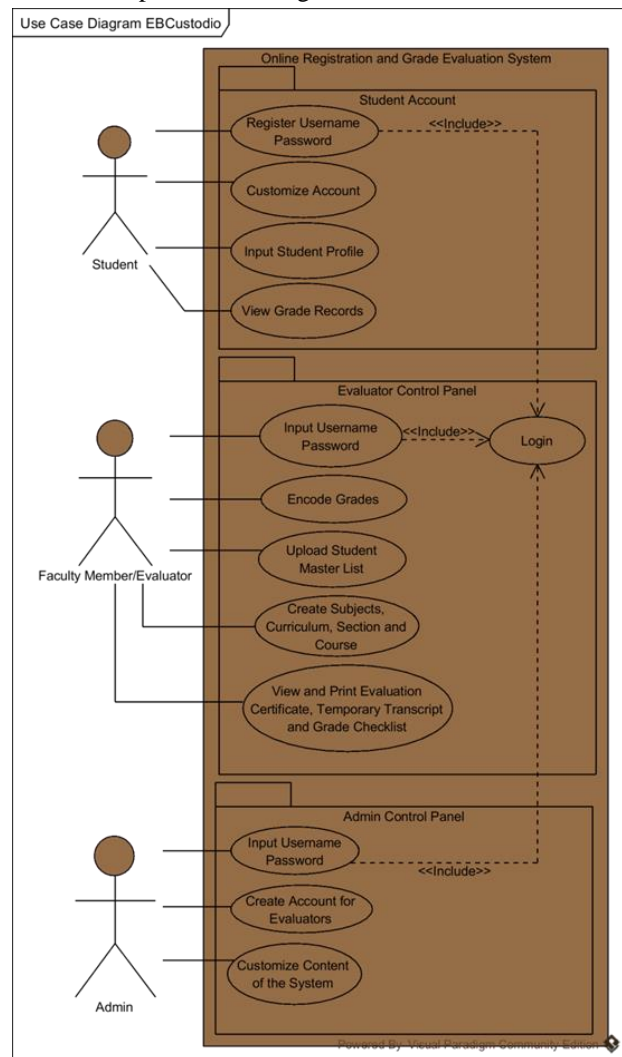Initial Class diagram of the developed system with its attributes is presented in Fig. 3.

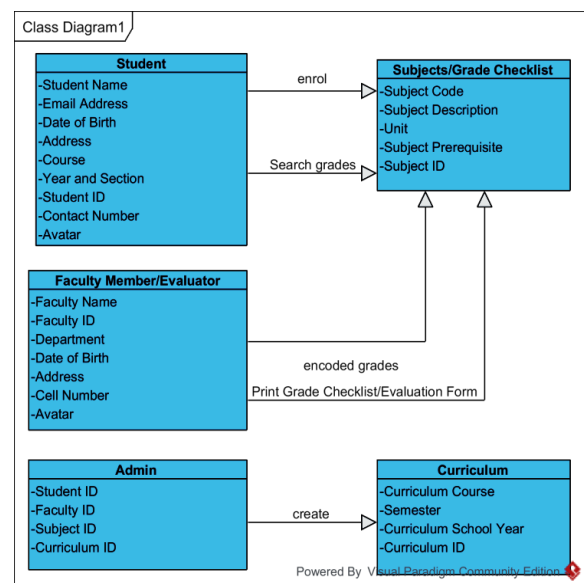Figure 2. Use case diagram of the system

Figure 3. Initial class diagram of the system

Five different classes were presented. The first is the *Student* which can enroll subject and search subjects from the class *Subjects/Grade Checklist.*

The second is the Faculty Member/Evaluator which is responsible for encoding the grades of the students and can print grade checklist and evaluation form. The Admin class is connected to the curriculum class. This is where the Admin can create Curriculum course for different possible program of the College.

VIII. THE DEVELOPED SYSTEM

This section shows the different forms, controls and pages for the different user-levels of the developed system. Fig. 4 shows the Log-in/Main Page of the System.

This is the main page when you access the site, where the user can enter their username and password for their account.

Figure 4. Log-In/Main page

This is also where the *registration* page for the students, *Help, About Us, and Contact Us* pages can be accessed. After the student logged into the system, they will be directed to the *Registration Page* where they can edit their account once the admin has added them into the student back-end of the system as a validation of their legitimacy of being an officially enrolled student of the College. This is where the students will enter their account and personal information and even choose their desired profile picture. The student will also be required to enter the *captcha code* for verification and security purposes.

Figure 5. Search student page for admin account

Fig. 5 shows the *Search option* for the Student Page. This is where you can view all the students registered in the system. Once the student number of the student is clicked, the personal information of the student will then be showed.

The admin can sort and filter the data according to name, by student ID, course, year, and section. This is also where the admin can access the students' curriculum records where grade encoding can be done.

IX. SYSTEM EVALUATION

The data analysis was generally descriptive and quantitative. For the results presentation, analysis and interpretation of data, the following statistical tools were utilized: (1) frequency and percentage distribution in identifying the classification of the respondents; and (2) weighted mean in determining the level of the system's acceptability concerning the different system criteria.

To facilitate the interpretation of the weight mean score of the responses, the upper and the lower limit of scale was adopted using the 5-point Likert Scale as shown below:

Numerical Rating	Descriptive Interpretation
4.60 5.00	Excellent
3.60 − 4.59	Very Good
2.60 − 3.59	Good
1.60 − 2.59	Fair
1.0 − 1.59	Poor

Five (5) IT professionals, six (6) faculty members and seventy (70) students were asked to evaluate the developed system. Total number of respondents and evaluators are presented in Table I.

TABLE I. RESPONDENTS AND EVALUATORS OF THE STUDY

Evaluators	Frequency (N)	Percentage (%)
Students	70	85%
Faculty Members	6	8%
IT Professionals	5	7%
Total	81	100%

A. Implementation Assessment

For the implementation assessment, different criterions for software evaluation were used as follows: functionality; reliability; usability; maintainability; portability; and training/documentation.

Table II presents the summary of the computed mean of the said software criterions. The table also shows the level of acceptability of the developed system.

Functionality registered a computed mean of 3.87 with a descriptive interpretation as "Very Good". Reliability on the other hand acquired 3.64 which is also interpreted as "Very Good" as its level of acceptability. Maintainability acquired 3.89 which garnered the highest mean among the other criteria. A total mean of 3.71 was computed for the website Usability, whereas portability got 3.79.

Lastly, Training and Documentation registered 4.89 total mean. Therefore, the system's level of acceptability was interpreted "Very Good" by the students, faculty

members and IT professionals during the system evaluation.

TABLE II. IMPLEMENTATION ASSESSMENT OF THE ONLINE REGISTRATION AND GRADE EVALUATION SYSTEM AND ITS LEVEL OF ACCEPTABILITY

Criterions	Mean	Descriptive interpretation
1. *Functionality*. Suitability, accurateness, interoperability, compliance and security.	3.45	Good
2. *Reliability*. Maturity, fault tolerance, recoverability and correctness.	3.02	Good
3. *Usability*. Understandability, learnability, operability, and provision for comfort/convenience.	3.59	Very Good
4. *Maintainability*. Analyzability, changeability and stability.	3.00	Good
5. Portability. Adaptability, installability, software compatibility and build environment portability.	3.23	Good
6. *Training and Documentation*. Availability of guides, technical or user's manual, provision for trainings/tutorials and provision for help component.	3.55	Very Good
Overall Mean	**3.76**	**Very Good**

X. CONCLUSIONS

In the light of the findings of the study, the following conclusions were drawn:

- This study developed an "*Online Registration and Grade Evaluation System: A Web-based Pre-Enrollment Registration Procedure*" which can perform several functionalities in order to accommodate the pre-enrollment registration process of different Colleges of BulSU.
- Several system functionalities were incorporated into the developed system like: (a) Online registration for students and recording and viewing of student grades; (b) encoding of officially enrolled student list; (c) creation of subjects and curriculum for different courses; (d) confirmation through email after registration; (e) online evaluation of grades using the subject prerequisite system and; (f) printable certification of evaluation and grade checklist.
- The developed system can be accessed by different users from its Main page. The Admin user interface on the other hand, could be accessed by the administrator only. In this count, the admin can easily edit or modify the content of the system. The admin can also delete information, print reports and maintain the website. Part of Project Evaluation is to conduct post-implementation reviews at the end of the project to validate the completion of the developed system for improvement.

XI. RECOMMENDATIONS

Recommendations could help broaden the scope of the study and perhaps give better clarity in particular areas.

In the light of the findings of the study, the following recommendations were drawn:

- It is recommended that the developed Online Registration and Grade Evaluation System should be implemented and utilized in the University in advancing its pre-enrollment procedure.
- Maintenance of the developed website is recommended. The administrator should maintain and update the student and curriculum information.
- A password recovery for the account users should be provided in case they have forgotten their account passwords.

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