Automated Certificate Issuing and Students' Management System for College of Technology, Jaffna: Sri Lanka

[1]V. Thusyanthy, [2]K. Thiruthanigesan, [2]W.M.P.P. Wanninayake and [2]N. Thiruchchelvan

[1]College of Technology, Jaffna, Sri Lanka
[2]University College of Anuradhapura, University of Vocational Technology, Sri Lanka

Abstract: The Jaffna, College of Technology examination and the student enrolments were conducted in hand written method. An investigation was conducted to computerize their administration and the examination division. Thus, a designed maintains system named College of Technology Management System (COTMS) for entire details of the institute with an objective; to formulate a computer software application for Jaffna College of Technology. COTMS was developed by using C#.Net programming language and Relational database management system in design the secured database with some particular rights to access the system, it also facilitated us in maintaining the entire students' records effectively and print the final certificate without much effort.

Key words: College of Technology Management System · Automated Certificate Issuing

INTRODUCTION

The Colleges of Technology in Sri Lanka originated from the Ceylon Technical College which was an institution of higher education for technical and scientific fields. It was established as the Government Technical College in 1893 at Maradana, Colombo; and in 1906, renamed as Ceylon Technical College. The Maradana Technical College Building has become a landmark in Colombo. Junior Technical Colleges were established in Galle, Kandy and Jaffna in the 1950s. In 1964 it was absorbed into the Department of Technical Education and Training over the next decades the several technical colleges were established around the country and the existing junior Technical Colleges were upgraded as College of Technology [1].

College of Technology's entire system of administration, such as student enrolments and maintenance, examination and issuing certificate procedures are handled manually, which causes for the possibility of misplacement of records and also the accessibility to records by unauthorized person, wastage of time, papers and space, difficulties in finding records. Provides a simple interface for the maintenance of student information, it can be used to maintain the records of students easily. Achieving this objective is difficult using a manual system as the information is scattered, redundant and collecting relevant information is time consuming [2]. These difficulties are totally resolved using COT management system in the College of Technology Jaffna. The research focuses on presenting information in an easy and comprehensible mode thus it reduces paper work and enables automated certificate generation process in College of Technology, Jaffna.

System Description: Collective details of all the departments into a single database system which makes easier in managing the data properly without any single mistake. Student enrolment, easy to enter the details with unique IDs saved in the database. System admin can log into the system and able to view students' details and permitted to enter the results of the students. Finally system automatically generates the certificates based on the results. The system completely admin authenticated.

MATERIALS AND METHODS

System Development: The COTMS was developed by using the C#.Net as the front end [3] and relational database Microsoft SQL server as the backend [4].

Corresponding Author: K. Thiruthanigesan, University College of Anuradhapura,
University of Vocational Technology, Sri Lanka.

The system consists of the following modules such as students' data entry module, students' data update module and marks data module. All the modules were subjected to the following testing.

System Testing: Unit and acceptance testing were performed according to the methodology used by Thiruthanigesan *et al*. [5]. Each module, data field validation was done by entering correct and wrong values for example in the Students' data entry module, Students' name field accepts only alphabets. This field has been tested by entering alphabet to ensure system accepts it and by entering numeric values to ensure system throws error message. Marks field accepts only numeric values. Initially, few errors were detected on negative values testing and then it was overcome by including appropriate error handling message. Once the form was filled, add button was clicked and data was served in the database. Few run-time errors were encountered during testing and then it was resolved by adding proper loops and other methods.

Acceptance testing was done to ensure whether the different functions of this system perform as expected. The user was able to add or modify or delete the student's details at any time. Part of the acceptance testing was performed with existing students' details. Second login to the system, the modified updated details were observed as we expected. System showed that some minor errors were resolved after examining the code and a fix was done such that update details were saved to the database properly. System was validated using the methodologies such as static validation testing components, dynamic components, text field validation, numeric field validation, empty field validation, range validation [5].

RESULTS AND DISCUSSION

The COTMS consists of the following main functional modules such as students' admission entry module, students' data update module, NVQ course semi1, semi2 marks handling module, other courses marks handling module, student result (certificate) module.

To start off with the admin home menus open when the admin officer opens with admin id and password (Fig. 1). Admin has the authority to create the new user account. Then user entry was authenticated by the user name and the password. Fig. 2, used to verify the data from the user. The logged in user's name and login time and dates were stored, automatically in the database. It is very useful to administration which able to monitor the user entry. Thereafter verification user was entered into the main module of the system (Fig. 3). Fig. 4 reveals that to register and maintain the basic details of all students of College of Technology, such as name of the students, unique id of the students date of the admission and index no. This module (Fig. 4) is easy to enter and update the student details. Student's detail were deleted from the data table that data automatically stored in another data table in the database. Since losing the entered data were avoided. This deleting and updating button was only visible to the admin, other users unable to access the button. Using student's National Identity Card number admin have the authority to update the database. National Vocational Qualification (NVQ) Courses Semester 1, Semester 2 marks were handled with this module (Fig. 5). This module used to insert, update and delete the diploma students' marks based on the student ID and their courses. Fig. 6 showed the certificate was restricted for any changes. It was allowed only for viewing and printing. However system allowed to update the results. According to the Eludire [6] a number of problems associated with student academic record management include improper course registration, late release of students' results, inaccuracy due to manual and tedious calculation and retrieval difficulties/inefficiency in controlling student marks sheet. But, COTMS was developed and overcome above mentioned problems with validations. This new user registration (Fig. 7) form was handled to create a new user to allow using this system. Admin/ Director is only allowed creating the new user. The new user detail is stored in database with created time and it is easy and more secured. Password stored database with encrypted password.

Jaffna, College of Technology faced the problems of issuing certificates and maintaining the student's data by manually. It took more time and difficult to maintain. The data stored in a traditional method. This leads to have difficulties in calculating data. COTMS found a new way to overcome the above problem that will help to provide the certificates effectively without any corrupted data or information and to provide a secured data base to store all students' details.

According to the Ezenma [7] the computerization results processing system should consist of Efficiency, Accuracy, Retrieve ability and Safety and security. Because, increasing number of students enrolling hard to cope with the paper work involved in the manual system of processing. As in all manually operated systems there are often errors to a very negligible extent and in addition to that information is stored in files, these information can be retrieved by searching for the file.
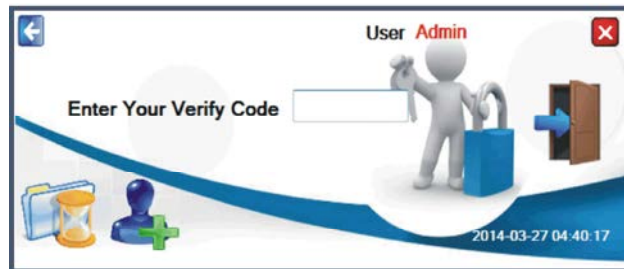
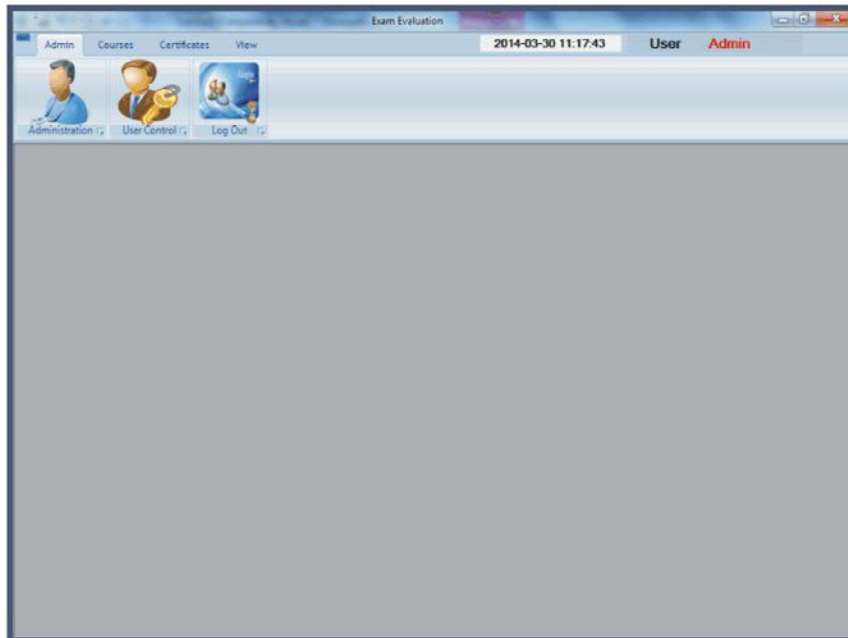Fig. 1: Login module for COTMS

Fig. 2: User verification module

Fig. 3: Main module of the COTMS

A computerized system will make the job more efficient and students will obtain their results soon after marking of the scripts is completed. Information stored in the computer is safe from animals, insects and intruders. Also a password can be used to make program as a secured system. COTMS was developed with all these conditions. So that COTMS has efficiency, accuracy, retrieve ability and safety & security. This project helps the staffs to maintain the student's details very efficiently. Also there cannot be any calculation errors in marks since this system automatically calculates the total marks and generates grade. It is well documented and reduces manual labour and minimizes the time for the easy maintenance. Finally COTMS was developed with a very good management and automatic certificate issuing system for College of Technology Jaffna.
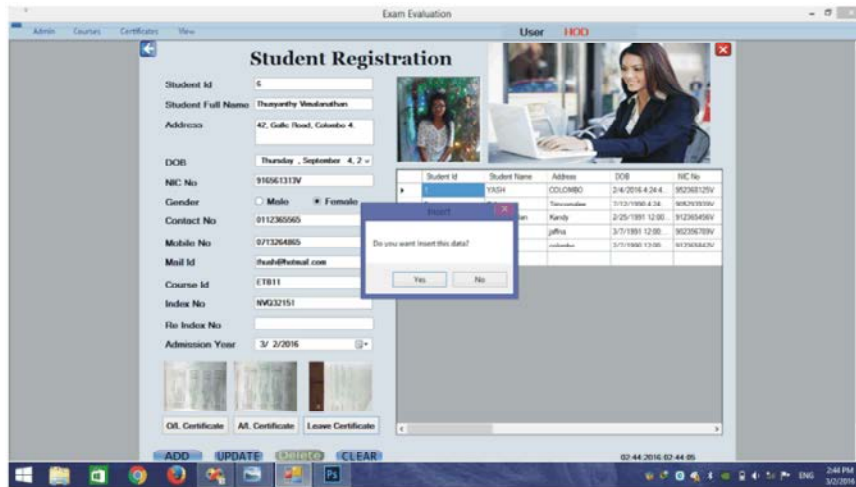
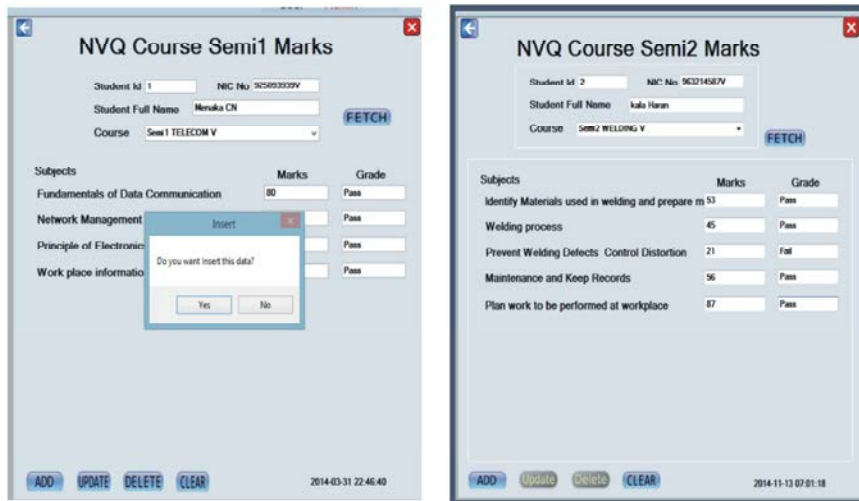Fig. 4: Student registration and update module of COTMS

Fig. 5: Module for marks entry

Fig. 6: Module for the generation of certificates

Fig. 7: Module for new user registration

CONCLUSIONS

COTMS is a complete database system for the College of Technology, Jaffna. It is gifted to store massive data related to students and produce final certificates according to the requirement of a secured system. COTMS successfully controls the data in a user-accessible manner. It furthermore permits the user to access, update and remove data in a flexible mode.

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