Design and Development of Alumni Tracking System for Public and Private HEIs

Ruth G. Luciano, Gloria M. Alcantara, Renato Bauat, Jr.

Abstract — Employability of graduates is one of the indicators being assessed by Higher Education Institutions (HEIs) to find out whether the quality of education they provide is suitable to the needs of the industry. This study was conducted to develop an alumni tracing system designed to allow the University to purposely trace its alumni using the internet. The system can be used as tool in finding out important information about them like their employment status and in identifying which skills are essentials in their present work. This information in return can help the HEI determines the improvement that they need to do with the existing curriculum. It can also generate comprehensive reports which are necessary for planning, program implementation and any decision-making purposes.

Index Terms— alumni, alumni tracking, curriculum, employment, higher education institutions, online alumni tracking

1 Introduction

Higher learning institutions (HEIs) must maintain close supervision among their students to ensure that they are getting adequate preparation to guarantee stable employment and to pass national board examination. This could also help assess the usefulness of the academic programs offering of the HEIs. According to Quitevis, et al. (2019), tracer study results could help assess the usefulness of the programs as well as their effectiveness, and eventually its success or failure [1]. In fact, Commission on Higher Education (CHED) has been firm on its stand that part of the moral responsibilities of HEIs is to know the whereabouts of their alumni - the kind of employment they have, their success and difficulties while seeking for jobs and while on-the-job. They are very rich sources of information which can help improve the HEIs' market relevance to address the following job-related problems (cited by Garcia, 2016): Imbalance between the supply of and demand for higher education graduates in the Philippines (Daguay and Padua, 2001) and mismatch between the level of competencies gained by graduates of HEIs and the expectations of industry resulting to unemployment (DOLE Report, 2008) [2].

The same situations prevailed in later years. An article of Bernabe published in Philippine Daily Inquirer on October 28, 2013 reported a World Bank study in 2011 which found that tertiary education failed to meet its potential because HEIs were operating as "disconnected individual institutions," rather than as parts of a larger ecosystem that included employers and companies [3].

In 2012, unemployment rate was placed at 16 percent in the second quarter of 2012, albeit lower than the 16.6 percent recorded in the same period in 2011, and the largest groups of unemployed or underemployed in the Philippines were college graduates.

Incompetency and the lack of skills for jobs available were often the reasons for graduates' failure to land jobs. Bernabe also reported what UP President Pascual stressed that youth unemployment was alarming and the pressures of globalization were compelling HEIs to produce graduates that were "business-ready" or graduates who could be readily employed right after graduation which relieved the industry of providing the initial training for its recruits.

The reasons above motivated the researchers to design and develop an online system that could help HEIs to trace the whereabouts of its graduates in all of its academic program offerings. It was in September 2019 when the researchers made a bold decision to do alumni tracking system as part of the academic requirements of the student-researcher involved in this study. It was made possible through the involvement of all program deans and other stakeholders of the HEI where this study was initially conducted.

Conceptual Framework

The October 2017-2019 graduates, the more recent graduates, were prioritized in the implementation of the proposed alumni tracking system because they were the ones who could provide more reliable recollections of their college education or experiences and more realistic Information on their biographical and educational profiles as well as the their employability in terms of job search methods, waiting time, employment status and monthly salaries.

Figure 1 below shows the research paradigm of the study.

- *Ruth G. Luciano is a full-time faculty of College of Information and Communications Technology (CICT) at Nueva Ecija University of Science and Technology (NEUST), Cabanatuan City, Philippines. rcgluciano@gmail.com*
- *Gloria M. Alcantara is a full time faculty of CICT at NEUST, Cabanatuan City, Philippines. She is also designated as the Program Chair of the said College.*
- *Renato Bauat, Jr. is a senior BSIT student of NEUST.*

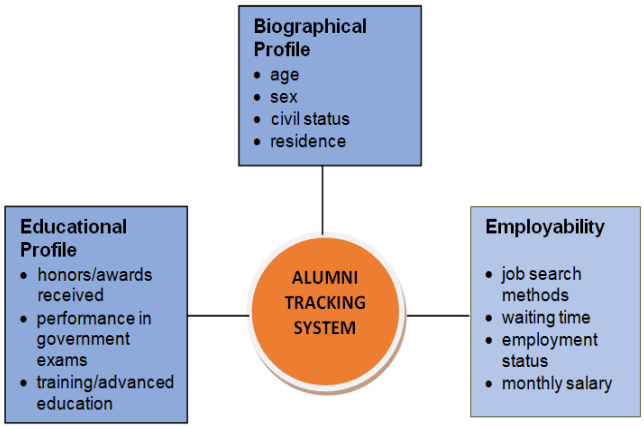


Figure 1. Research Paradigm

Statement of the Problem

This study generally aimed to design and develop an online alumni tracing application. Specifically, this study sought answers regarding the similarities and differences of the existing alumni tracing system and the one being proposed in this study. It also tried to find out ways on documenting the requirements of the system in terms of hardware and software and creating blueprints of the proposed online alumni tracking system.

2 METHODOLOGY

Research Design

The developmental research design was used in this study. It involves situations in which the product-development process is analyzed and described, and the final product is evaluated [4]. This study aims to develop a system that is designed to assist HEIs in tracking its graduates.

Respondents

The respondents of this study were composed of 10 college deans and program chairpersons from one state university in Nueva Ecija, Philippines. The purposive sampling procedure was used in selecting them. They were chosen on the basis of ability to provide information needed in the development of the proposed system.

3 RESULTS AND DISCUSSION

Current System vs. Proposed System

At present, the University under survey uses the traditional manual system in tracing its alumni. This activity is spearheaded by the Alumni Office which is under the umbrella of Office of Student Affairs (OSA). Generally, tracing of alumni is done per college. Every college is regularly conducting homecoming activities as a means of getting in touch with their alumni and in trying to see the relevance of the curriculum in the industry where they are working. Other means to collect data is through the use of Google form especially to those graduates who are working abroad. House to house method of data gathering is also employed to gather data.

The proposed system on the other hand, is designed and developed to automate the gathering of alumni information. The alumni tracking application is a web-based system that is accessible to all alumni. It can also be used as a website/medium for graduates and their respective college alumni coordinators to stay in touch with each other. Important data from the alumni are solicited through this platform. These data, particularly on their employment, can be used as bases in making strategic decisions, i.e. curriculum revision, research agenda preparation, potential extension activities among others. The website can be accessed using a mobile device through which college graduates can update their current employment status and other information. All the collected data shall be stored in a server.

System Requirements

Hardware

The researchers made used of devices capable of connecting the system to the internet. Listed below is the hardware requirement in order for the system to be used efficiently and effectively.

SUPPORTED PLATFORMS		
Windows 7 – 32 / 64 bit Windows 8 – 32 bit / 64 bit Windows 10 – 32 bit / 64 bit Linux – 32 bit / 64 bit		
COMPONENT	**MINIMUM**	**RECOMMENDED**
RAM	4 GB	8 GB2
Processor	Intel Core 2 DuoAMD A6	Intel Core i3 AMD A8
Graphics Display	Built-In	
Hard Disk Space	250GB	1TB+

It is can also be installed on any mobile devices like Android or IOS, with at least 2GB of memory.

Software

The following programs were utilized in designing and developing the proposed system:

Hypertext Markup Language (HTML) 5.0 or higher. This scripting language is used to add paragraphs, headings, images and links to the webpage [5]. In this study, this is very useful tool in designing the interface of the software including its hyperlinks.

Notepad++. A software that is used to edit the source code [6]. In this study, this is used as the main source code editor in designing and developing the alumni tracing system.

PHP (Hypertext Preprocessor). An HTML-embedded scripting language and interpreter [7]. It is used to develop the proposed system by connecting it to the database.

PhpMyAdmin. It is used to perform different tasks such as managing databases, tables, columns, relations, indexes, users, and users' permission [8].

JavaScript. It is used in the development of the proposed website for the purpose of validation. In addition, it also supports external applications like PDF documents. It can also load content into a document whenever the user requires it without even reloading the entire page [9]. Generally, this software is used in the proposed system to make the web pages functional.

Bootstrap. It is a free front-end framework for faster and easier web development. It includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, modals, and image carousels and so on [10]. It also includes optional JavaScript plug-ins and also gives the ability to easily create responsive designs.

JSON. It is used as syntax for storing and exchanging data. It is written with JavaScript object notation [11]. This software is used to create the dashboard which shows the survey statistics through graph presentations.

Ajax (Asynchronous **J**avaScript **A**nd **X**ML). It is a technique for accessing web servers from a web page. It allows web page to be updated asynchronously by exchanging data with a web server behind the scenes [12]. This means that it is possible to update parts of a web page, without reloading the whole page. It also helps PHP to execute all the programs connected to it.

Font Awesome. It is a font and icon toolkit based on CSS and LESS. Font Awesome has a 20% market share among those websites which use third-party font scripts on their platform [13]. This is used by the developers to enhance the appearance of the icons, pictures and font colors.

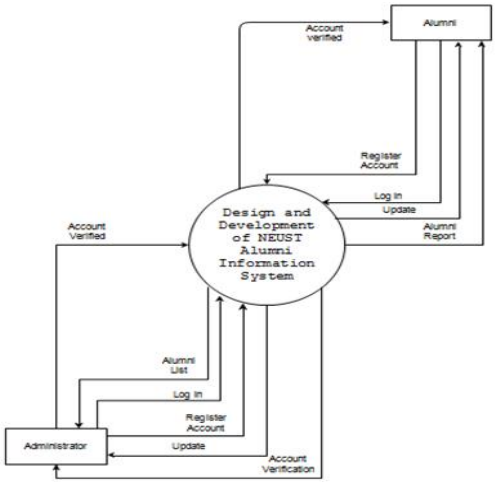
Requirement Documentation

The researchers decided to create a system that can help the university to track its alumni easily and to secure the information solicited from them. They thought that this system can provide innovative way for the university to communicate with its graduates. They also added some special features like SMS notification to encourage alumni to regularly update their information. Diagrams presented below are used as blueprints in designing and developing the system.

The figure below shows the context level data flow diagram (DFD) used by the researchers as guide in designing and developing the alumni tracking system.

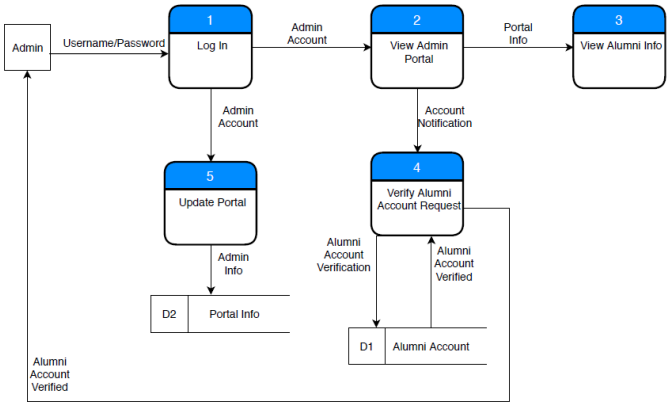
Figure 2. Context Level DFD

Specifically, figure 2 is used by the researchers to define and clarify the boundaries of the proposed system and it also identifies the flows of information between the system and external entities.

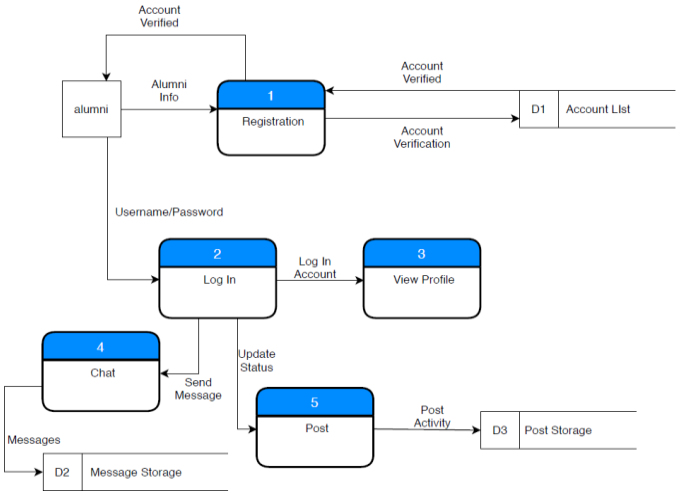


The researchers also prepared level 0 data flow diagrams for system administrator (figure 3-a) and for end-users (figure 3-b). These diagrams are used to give an overview of the full system.

Figure 3-a. Level 1 DFD for System Administrator
Figure 3-b. Level 1 DFD for End-Users (Alumni)



The diagrams above also show that major processes in the system are broken down into sub-processes. Level 1 DFDs also identify data stores that are used by the major processes.



In addition, the researchers also prepared two (2) use case diagrams, 1 for system administrator module and another one for the alumni. These diagrams show the interactions among the elements of the system (see figure 4-a and 4-b).

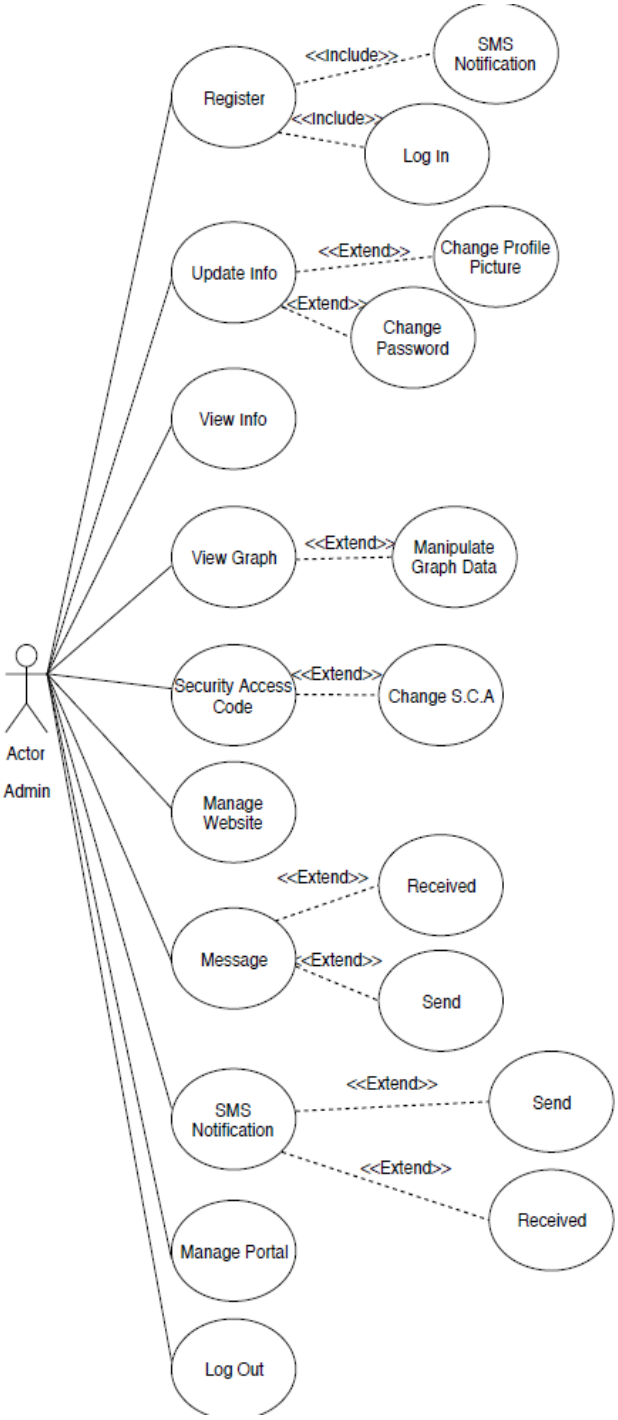
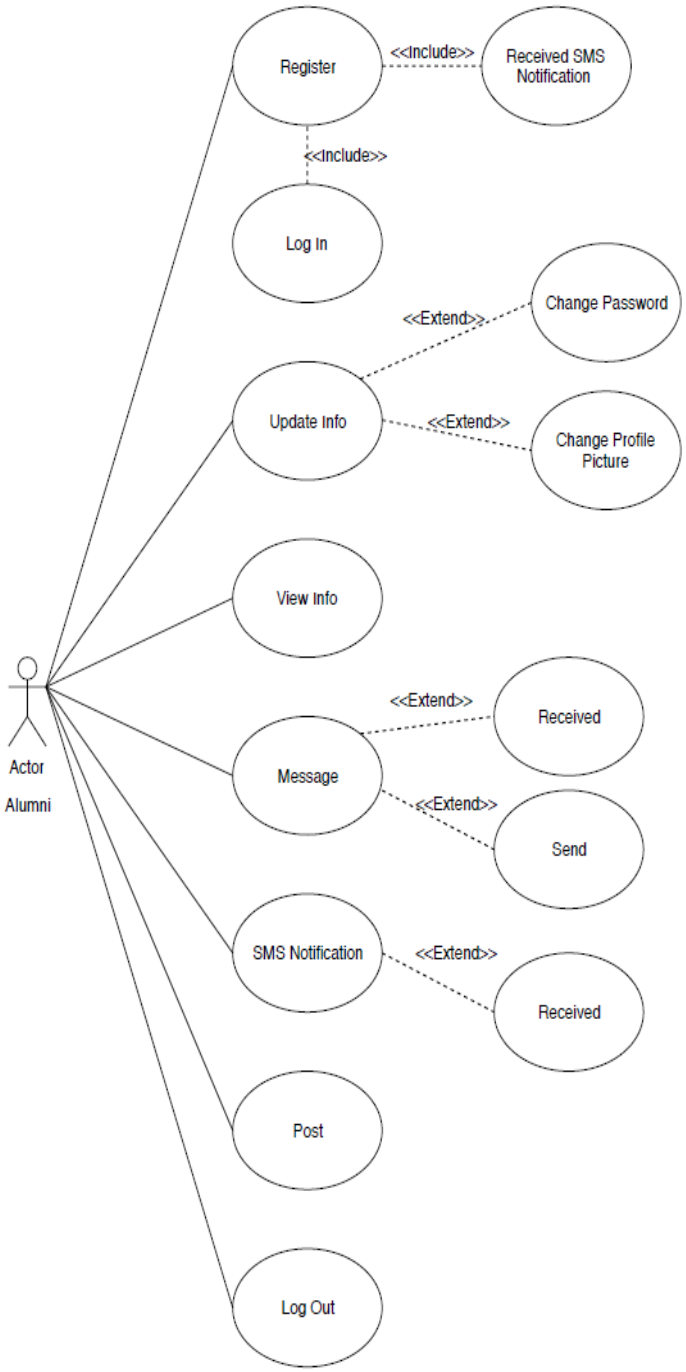


Figure 4-a. Use Case Diagram – Administrator

Figure 4-b. Use Case Diagram – Alumni



4 CONCLUSIONS

Admittedly, alumni are valuable assets of the institutions of higher education. Thus, the more alumni communication is in-tact the greater opportunities for feedback and knowledge development. An alumni portal facilitates the promotion of research, the exchange of experience, in addition to providing personal, professional and academic networking. The developers decided to create the Alumni Portal System to help the university to track the alumni and to gather their information thru online portal without hassle. Alumni can use their own mobile devices to register,

monitor and update their current status. In view of the above, the developers would like to recommend that additional verification procedure be made to ensure that only bona fide alumni can register in the system. Main innovations encompass the inclusion not only of the alumni, but also the current students to the alumni portal, therefore, the link with the university is strengthened from the beginning with a tendency to bolster the bond between the students (current and alumni) and the educational institution.

ACKNOWLEDGMENT

The authors wish to acknowledge and extend their sincere appreciation to the: (1) participants of this study; and (2) faculty, staff and students of NEUST – College of Information and Communications Technology (CICT), Sumacab Campus.

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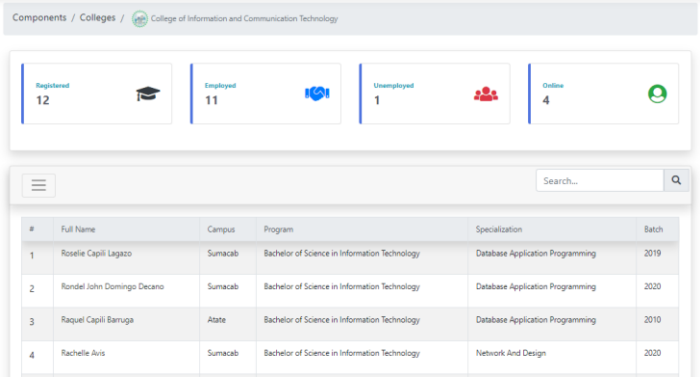
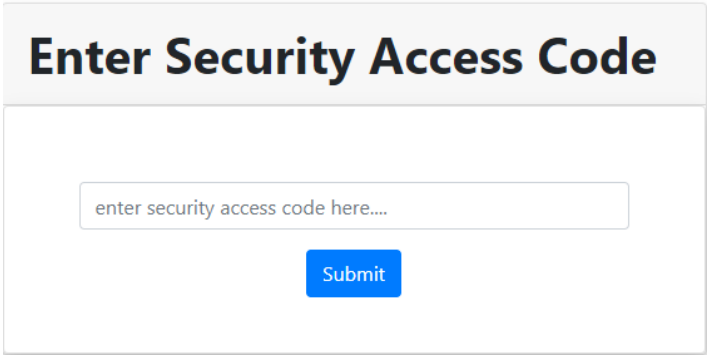
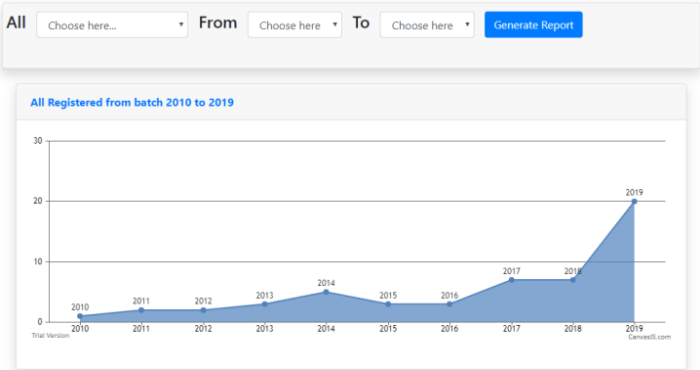
Appendix A - User's Guide with Screenshots

ADMINISTRATOR'S MODULE

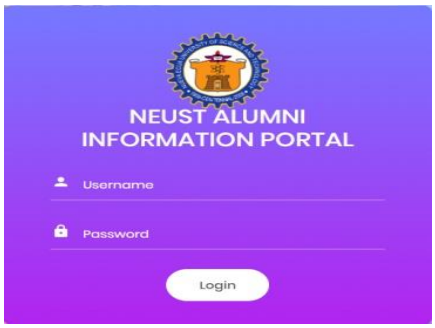
The administrator (admin) has to enter a Security Access Code first.



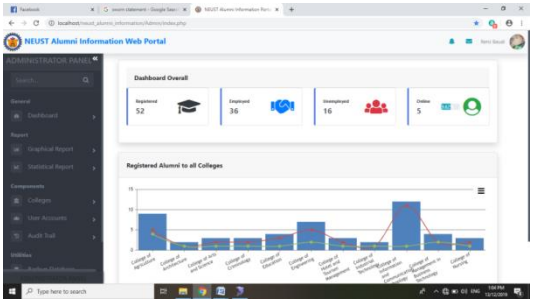




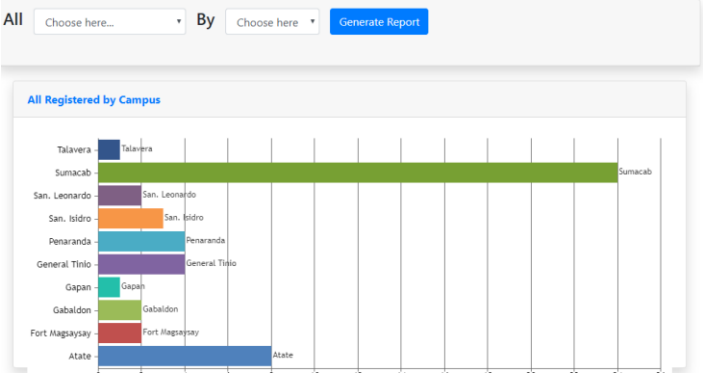
After entering the Security Access Code, the admin must login using the assigned username and password.



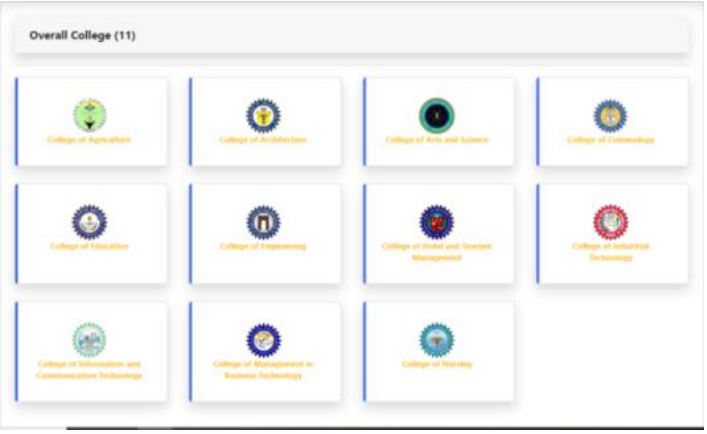
After he/she logged in, the system dashboard will appear. In the dashboard, the admin can see the total number of registered users. Likewise, statistics of employed and unemployed alumni can also be seen in the dashboard.



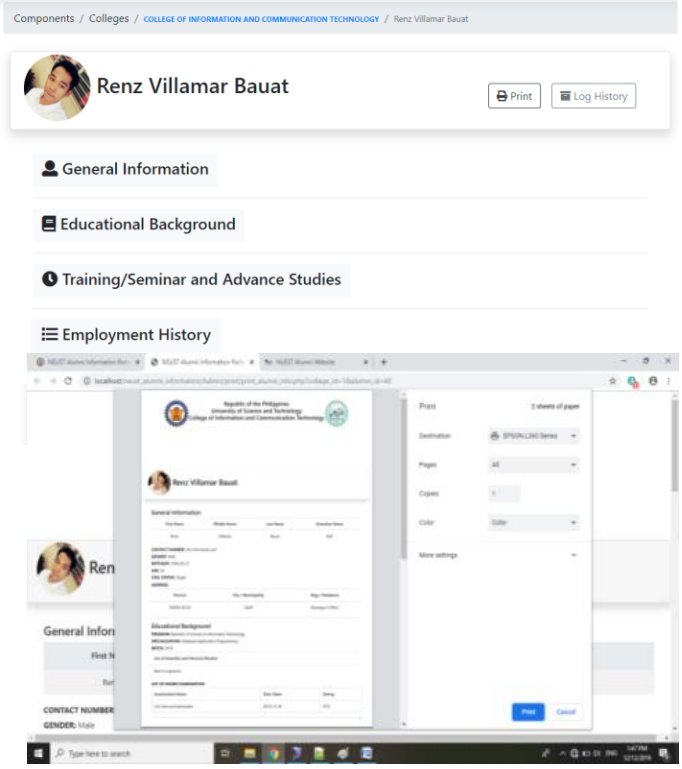
In the Graphical Report, the admin can manipulate graph depending on what he/she wanted to view, i.e. by program, by batch, etc.



The Statistical Report tab is used to view graphical illustration of records stored in database. It also includes important statistical reports that the system can generate. In the College tab, the user shall be prompted with clickable links showing the different colleges in the university, i.e. College of Information and Communications Technology, College of Nursing, Graduate School, etc.

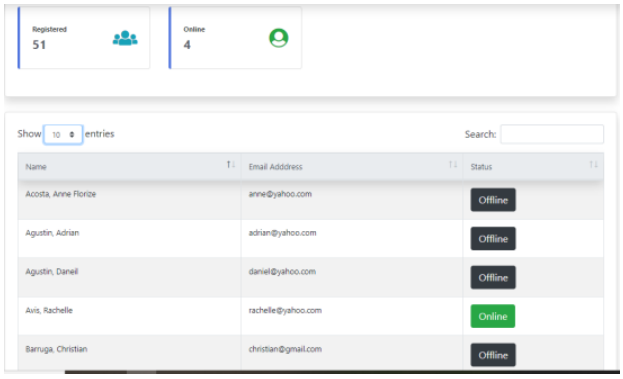


When the admin clicks on the College tab, all registered alumni of the selected college shall be displayed. Employability reports are also made available through this. In this form, monitoring of alumni who are online at the moment the system is active is also provided in the system. When admin clicks the name of any of the registered alumni, their information can be viewed. Printout of the same can be generated. In addition, the admin can also view their log history.

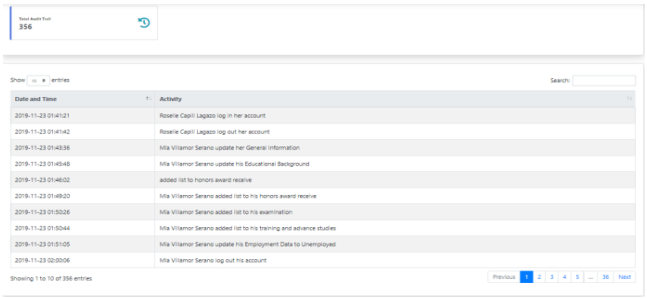


ALUMNI MODULE

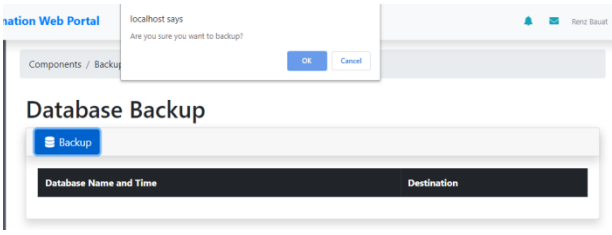
In the User Accounts Tab, the names, email addresses and status of all registered alumni are shown.

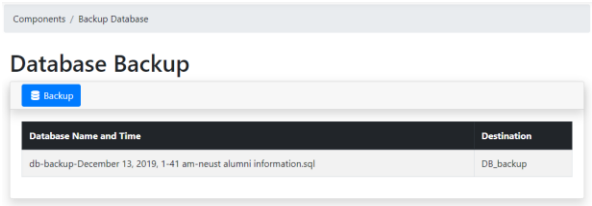


The log history of all alumni including the admin can be viewed in the audit trail tab.



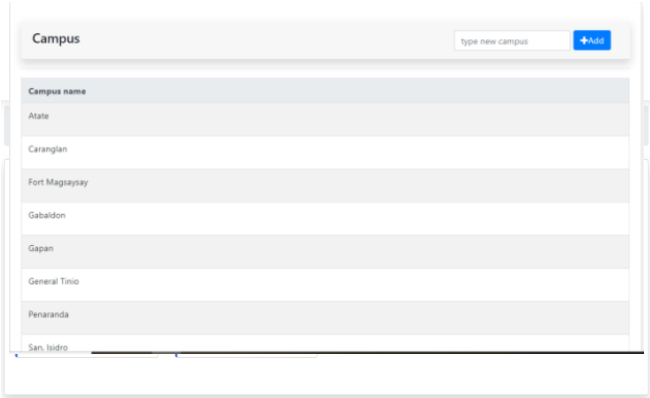
In the Backup Database Tab, the admin can backup of all data/information stored in the database.



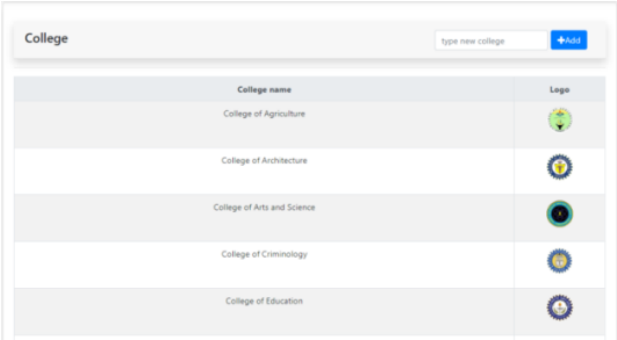


In the Settings tab, the options like campuses, colleges, programs, specializations, alumni website and send SMS cab be seen.

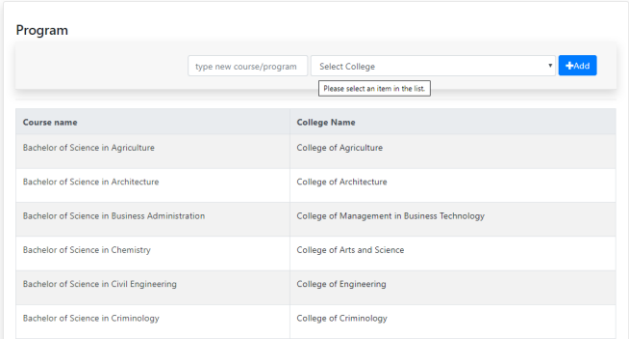
When the admin clicks the “Campuses” tab, all campuses will be shown. The admin can also add and update campuses’ information.



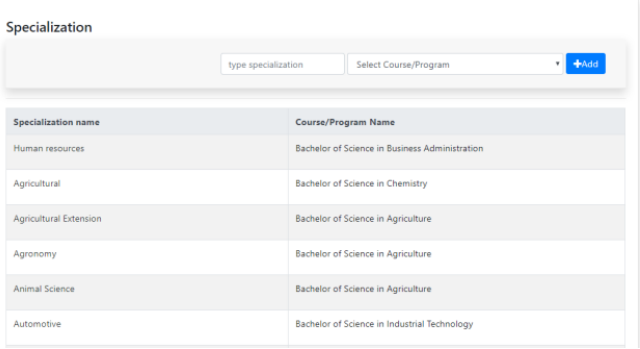
When admin click the Colleges tab, all colleges will be show. The admin can also add and update colleges.



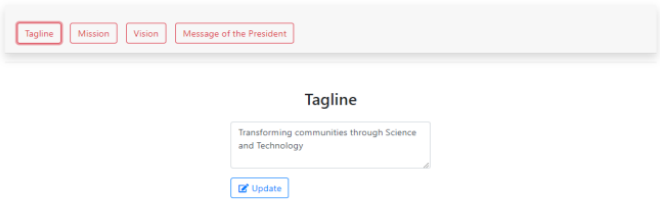
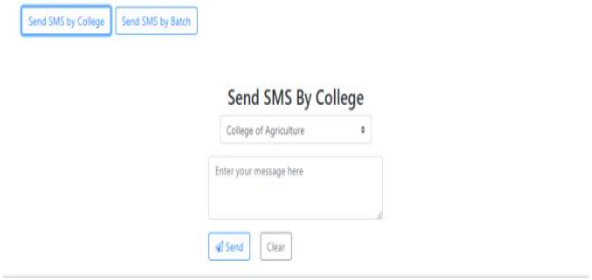
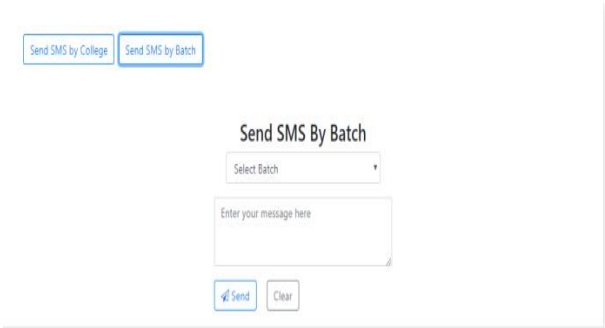
When admin click the Programs, all programs will be shown. The admin can also add and update programs.



When the admin clicks the “Specialization” tab, all the specializations will be shown. The admin can also add and update specialization.



When the admin clicks on the Alumni Website, the Tagline, Mission, Vision and Message of the President of the University will be shown. These contents can be edited/updated by the admin as the need arises.



When admin clicks on the Send SMS button, SMS notification will be sent to the intended recipient/s. The admin can also choose to sort the alumni records either by college or by batch.