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Design and Development an Interactive On-the-Job Training Monitoring and Help Desk System with SMS for College of Information and Communication Technology

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Abstract

This study aimed to develop An Interactive On-the-Job Training Monitoring and Help Desk System with SMS for the College of Information and Communication Technology Nueva Ecija University of Science and Technology. The system made the OJT course procedure trouble-free by emerging a system accessible through the internet. Students have a user account, which gives them the aptitude to upload document files of their reports, thereby minimizing the time and energy spent traveling from the company's location to the university and the other way around. Similarly, the OJT coordinators of the college are given their accounts to access and check the reports submitted by the students. The system is capable of generating reports and requirements in real-time, as long as all data is stored within the database and, therefore, the process is completed online. In addition, the system provides an interactive website that might help both students and coordinators to communicate instantaneously by having an online help desk where the students can ask related questions on their OJT course that the OJT coordinator and other students will answer. The coordinators can send a brief message service to the students enrolled within the OJT course through the utilization of the proposed system - this can be for the students who aren't capable of opening their account more often, in order that they are still informed of the announcements they need to understand immediately. The interactive OJT help desk system with SMS can be used as a tool to help the students of the College of Information and Communication Technology (CICT) and the OJT coordinators in their tasks more conveniently.

Keywords

Short Message Service (SMS), Application Program Interface (API), On-the-Job Training, PHP, Bootstrap, MySQL

1. Introduction

One of the University and Colleges's main goals is quality education and producing graduates with the knowledge and skills needed to succeed in the field of choice. This can be achieved through the provision of excellent education, equipment and quality programs. NEUST offers a selection of programs that are either on-the-job training or internship courses.

This style of training combines on-the-job training for students with applied learning at university. This opens up opportunities for motivated and academic students to begin their careers while still in school. It enables students to achieve academic performance, learn a trade, and ultimately find employment. The training will be attended by students, a field supervisor, and an internship coordinator. It enhanced the technical, personal, and conceptual skills of the students taking up the OJT course. In addition, these skills can be boosted through this course. On-the-job training (OJT) course is one of the requirements for students to earn a degree. This course offers the opportunity to apply the theories, principles and ideas learned at the educational institution under supervision. These training programs ideally expose students to the reality of improving their skills and preparing them in the real world. [1] [2] [3]

In this regard, many universities and state colleges use national and private institutions as venues for on-the-job training programs, one of which is Nueva Ecija University of Science and Technology. Due to the importance of on-the-job training programs, students training in these private and public institutions must be ensured that competency-specific assignments and mentoring are given. At each private or public company, working students are assigned every two weeks by an on-site supervisor assigned by a partner agency/company/office to discuss job performance, abilities, work attitudes, reporting compliance, attendance and expertise. It will be evaluated. Normally, NEUST-CICT students pursue their internships in these public and private institutions, and in most cases, these companies are outside Nueva Ecija. [4]

This provides an opportunity for students with enthusiasm and academic ability to embark on a career while in college. It enables students to achieve academic performance, learn a trade, and ultimately find employment. However, once a student is enrolled in a course, they must submit a training report on a pre-agreed schedule while complying with the requirements. This will continue until the student completes the required number of hours. In doing so, OJT coordinators face the difficulty of monitoring student performance and submitting their weekly reports in a timely manner, especially if the number of trainees

is large and their location is not nearby.

In this regard, the main objective of this study is to lessen the problem of students and the OJT coordinator; the proponent proposed to develop an interactive OJT monitoring and help desk system with SMS for the students at Nueva Ecija University of Science and Technology (NEUST) Bachelor of Science in Information Technology Gen. Tinio Campus. The system will be used as online monitoring for the students' requirements they pass every week. Instead of traveling back and forth from the company to school, the students will submit their weekly reports online. The scanned weekly report will be sent as a portable document file (PDF) to ensure that the company ratifies the student's requirements. [5]

In addition, students who take this course can benefit by submitting a weekly report to the OJT Coordinator each week to minimize the time and cost of round-trip travel. On the OJT coordinator's side, there can monitor student requirements weekly without having to collect cumbersome requirements paperwork. In addition, the OJT coordinator can use this system to distribute information about OJT courses to students via SMS. [6]

Objectives of the Study

This project aims to develop an interactive OJT monitoring help desk system with SMS for the benefit of the College of Information of Science and Technology (NEUST), General Tinio Campus.

Specifically, this study has the following objectives:

- To design and develop An Interactive On-the-Job Training Monitoring and Help Desk System with SMS for the College of Information and Communication Technology Nueva Ecija University of Science and Technology.
- To provide a valuable system for the OJT students to minimize the time, effort, and money they spend submitting their weekly reports.
- To improve the process of keeping the weekly reports submitted by the student by collecting the files through an online system.
- The integration of SMS functionality to the system for immediate sending of important information/announcements to OJT students.
- The OJT students can use an online system to post their inquiries regarding the OJT course.
- To make accessible communication between the OJT students and coordinators by using the online help desk.

2. Methodology

The proponent used the Systems Development Life Cycle (SDLC), and developed an interactive OJT monitoring help desk system using SMS for the benefit of the University of Science and Technology (NEUST). The Systems Development Life Cycle (SDLC) is a conceptual model used in project management that describes the phases associated with an information system development project,

from initial feasibility studies to maintenance of the completed applications. This method of investigation seeks to represent what exists in a group or population. It is more comprehensive and more comprehensive than all other research methods. Helps you know how to achieve your goals in less time. Applied methods refer to scientific research and research aimed at solving real problems. Applied research is used to find solutions to everyday problems and develop innovative techniques. This method is used to find answers to the problems faced by all OJT students and to develop innovative systems to address the problems of OJT courses. [7]

Procedures of the Study

This study involved the following phases of the Web Development Life Cycle: Planning, Analysis, Design, Coding, Testing, Implementation, and Maintenance.

This study involved the following phases of the Web Development Life Cycle: Planning, Analysis, Design, Coding, Testing, Implementation, and Maintenance.

2.1. Planning

The first phase involves the identification of the goals and purpose of the website and activities that were accomplished during this phase.

1) The system's primary goal is to make the OJT course more convenient, secure, and less expensive. And its purpose is to provide an easy and cheaper way of submitting weekly reports by the students to the OJT coordinators and to disseminate related information and messages to the students from OJT coordinators. The target is to provide a website where the users could view their profile, upload a portable document file of weekly reports and pass it through the use of the system, post an inquiry to be answered by the coordinator and other students and receive text messages from their OJT coordinator.

2) Interviews were conducted with the OJT coordinators and On-the-Job trainees of the College of Information and Communications Technology. By presenting the prototype design of the researcher, the trainees will gain more knowledge of what the system is about and how the users can help the system in submitting weekly requirements through online.

2.2. Analysis

The following activities were accomplished during the analysis phase:

1) The proponent determined the website contents and functionalities.

2) The proponent considers the related reviews as the addition of information regarding the project's title and its contents which is the most important on the website.

2.3. Design

The following activities were accomplished during the analysis phase:

1) The proponent organized the website's contents in some general pointers,

including the elements of the website, which are the titles, headings, horizontal rules, paragraphs, lists, page length, information, and tables.

2) The proponent links or connects each layout of the web pages in a different structure to define how users navigate and view the web pages. The proponent used a format for a website based on how users will most easily navigate through the site to complete tasks and view the website contents.

The following diagrams were described and constructed by the researcher to aid the proponent in the design according to what the system needs.

a) Data Flow Diagram

Figure 1 & Figure 2 below show the context diagram and the Data flow Diagram of the Online Interactive OJT Help Desk and Monitoring System with SMS. The OJT coordinator can disseminate student announcements through the system by posting and sending text messages. The students can see and receive the notification and post a question related to the course, which will be answered by the students or coordinator. The students also can submit their weekly reports through the said system and be reviewed by the coordinator.

b) Database Normalization

A Database Normalization is a technique for organizing the data in the database. Figure 3 below shows the data normalization table from the unnormalized

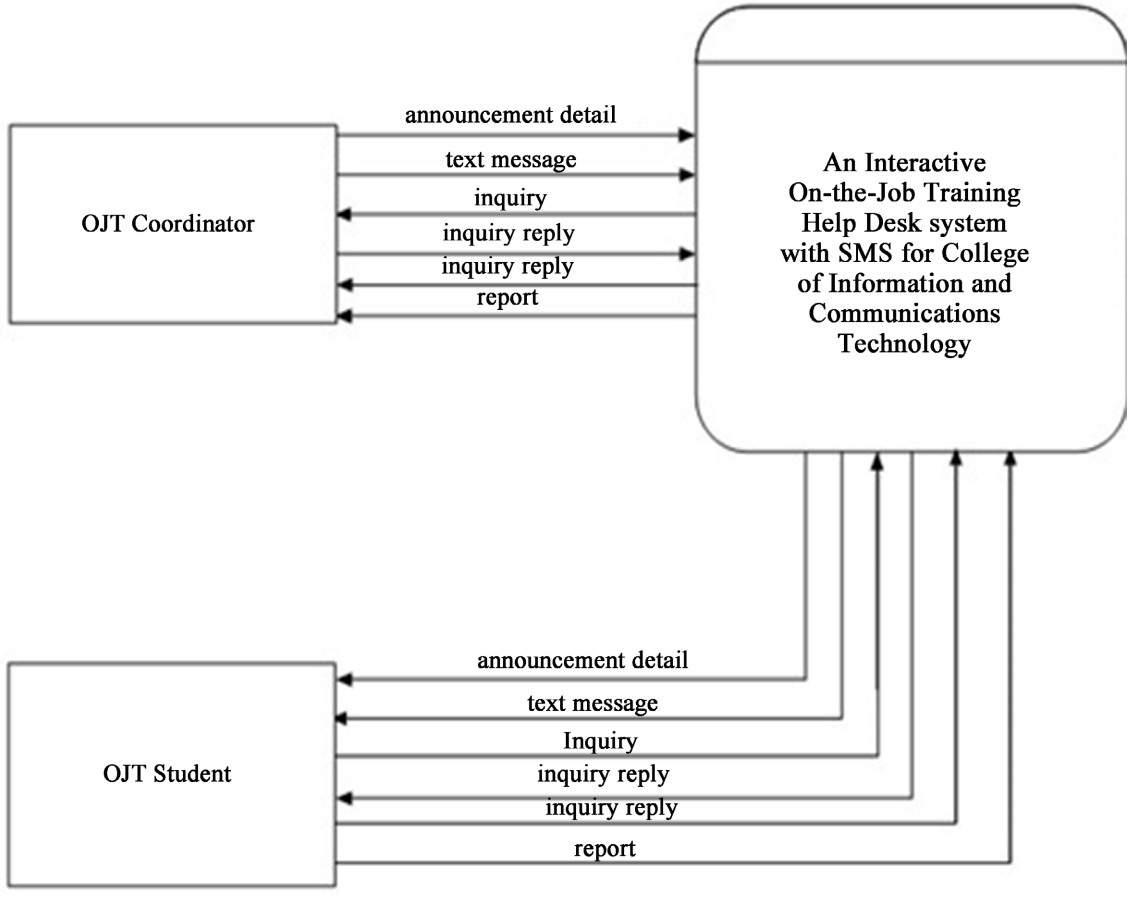

Figure 1. Context diagram.

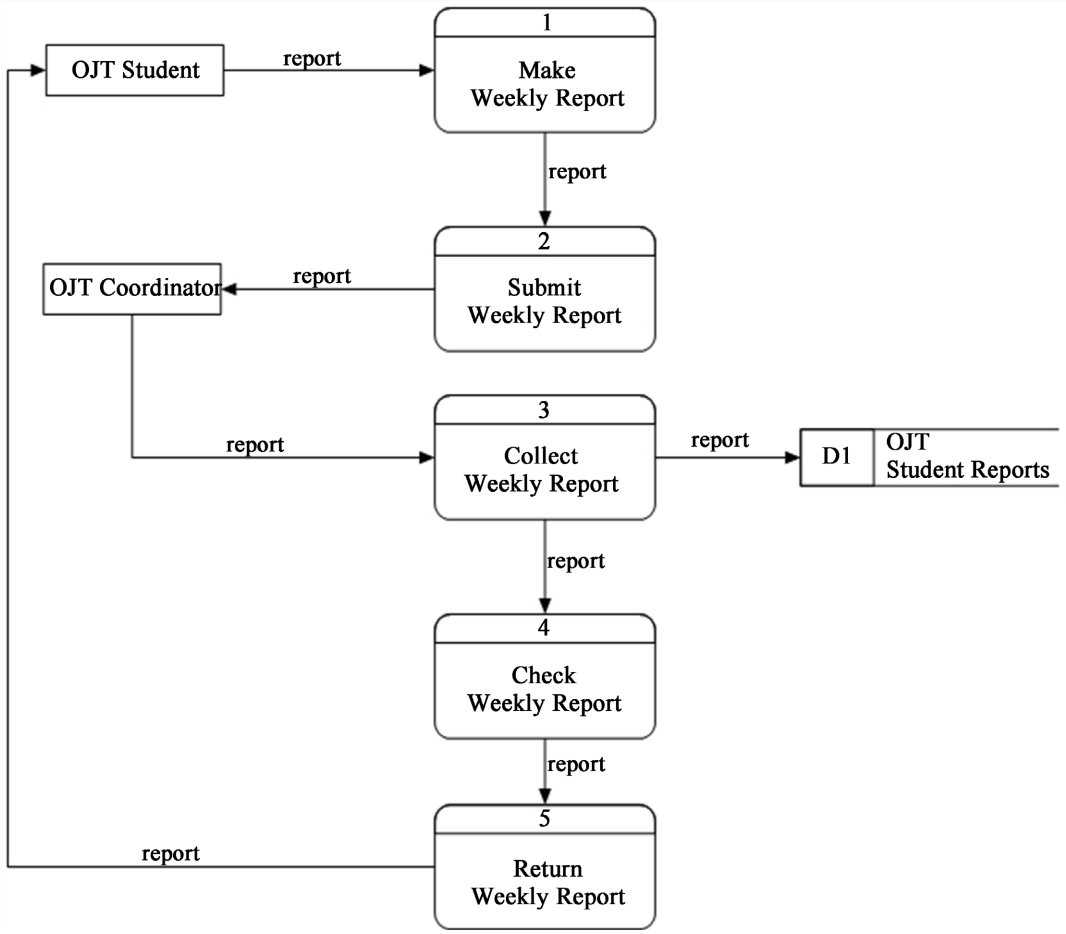

Figure 2. Data flow diagram.

form to the third normal form.

c) Entity-Relationship Diagram

An Entity Relationship Diagram (ERD) is a specialized graphic that illustrates the relationships between the entities in a database. Figure 4 below shows the relationship of each table used.

d) Use Case Diagram

The use case is a software and system engineering term that describes how a user uses a system to accomplish a particular goal. It defines interactions between external actors and the procedure to attain specific goals. Figure 5 below shows the Use Case Diagram of the interaction of the student as the user, OJT coordinator as the admin of the system, and SMS gateway.

e) Data Dictionary

Data Dictionary is a set of information describing the contents, formats, and description of a database. The table below shows the Data dictionary of the OJT Database. (See **Appendix A**)

2.4. Coding

The following activities were accomplished during the coding phase;

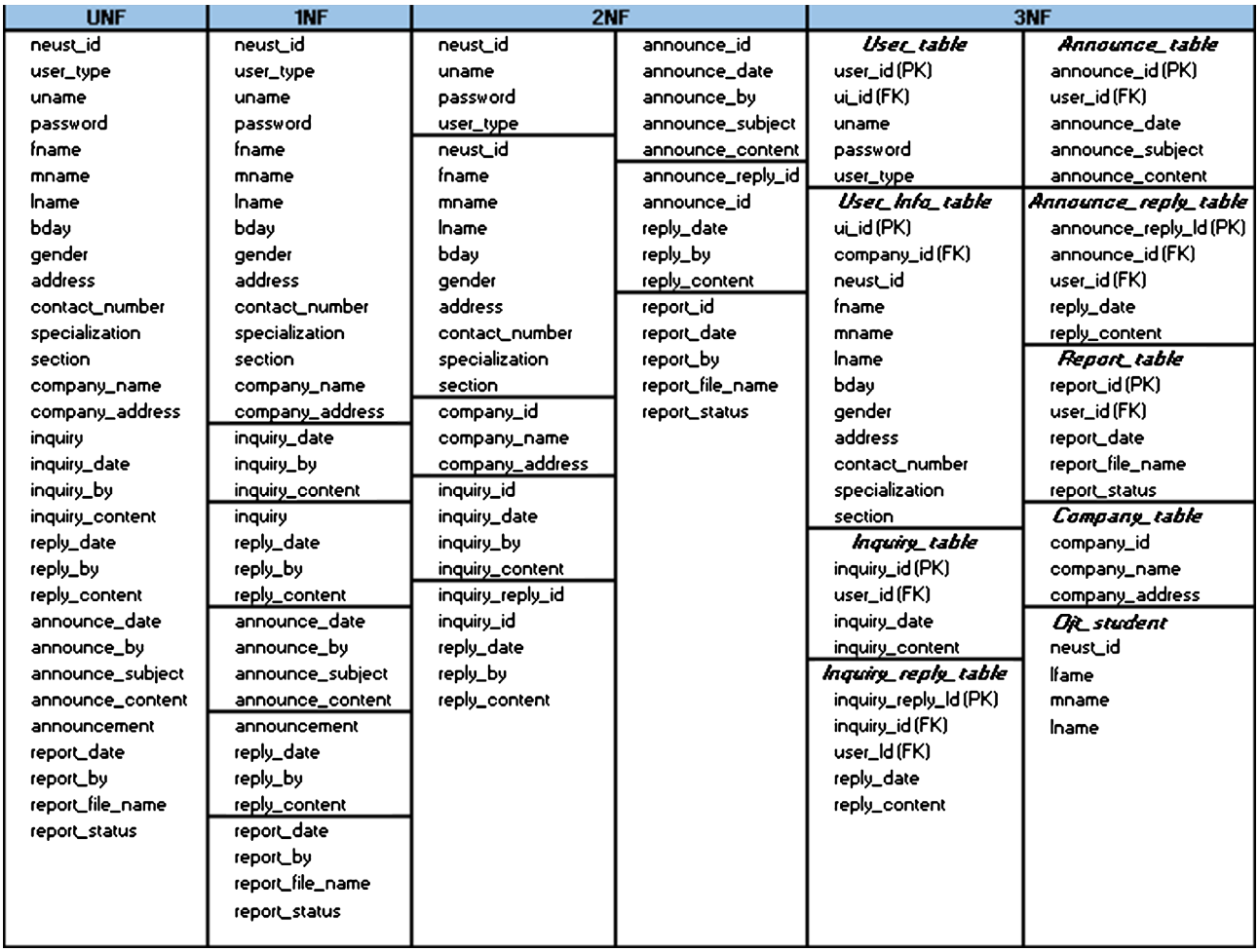

Figure 3. Normalization.

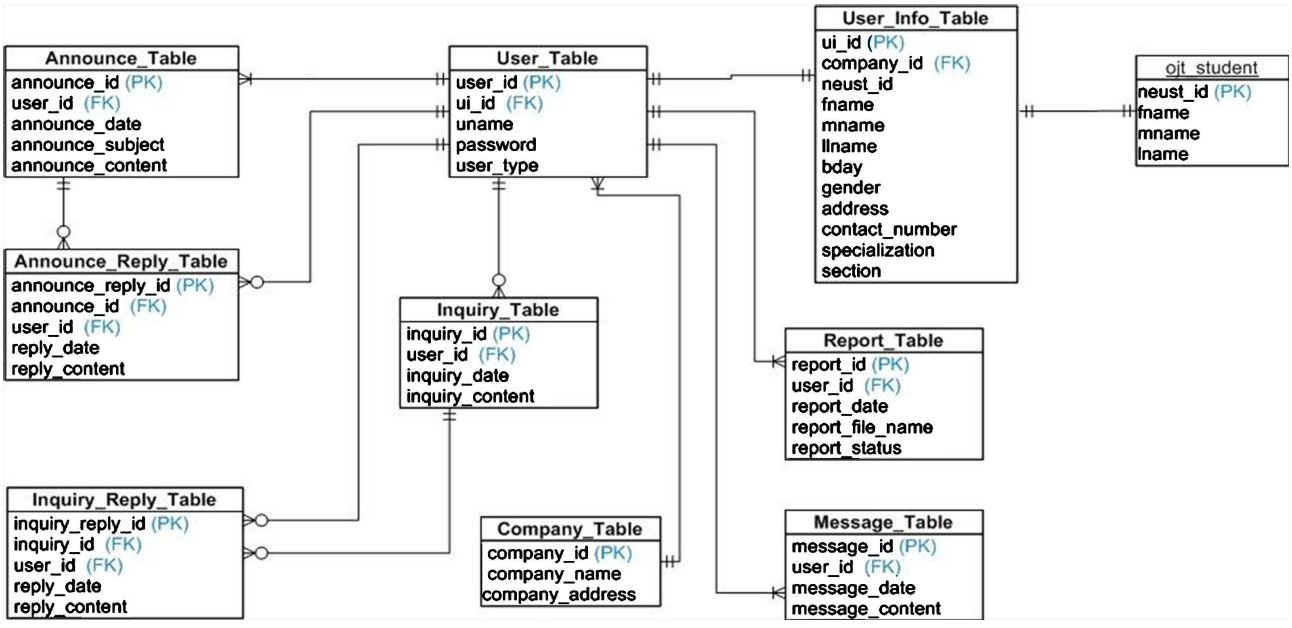

Figure 4. Entity relationship diagram.

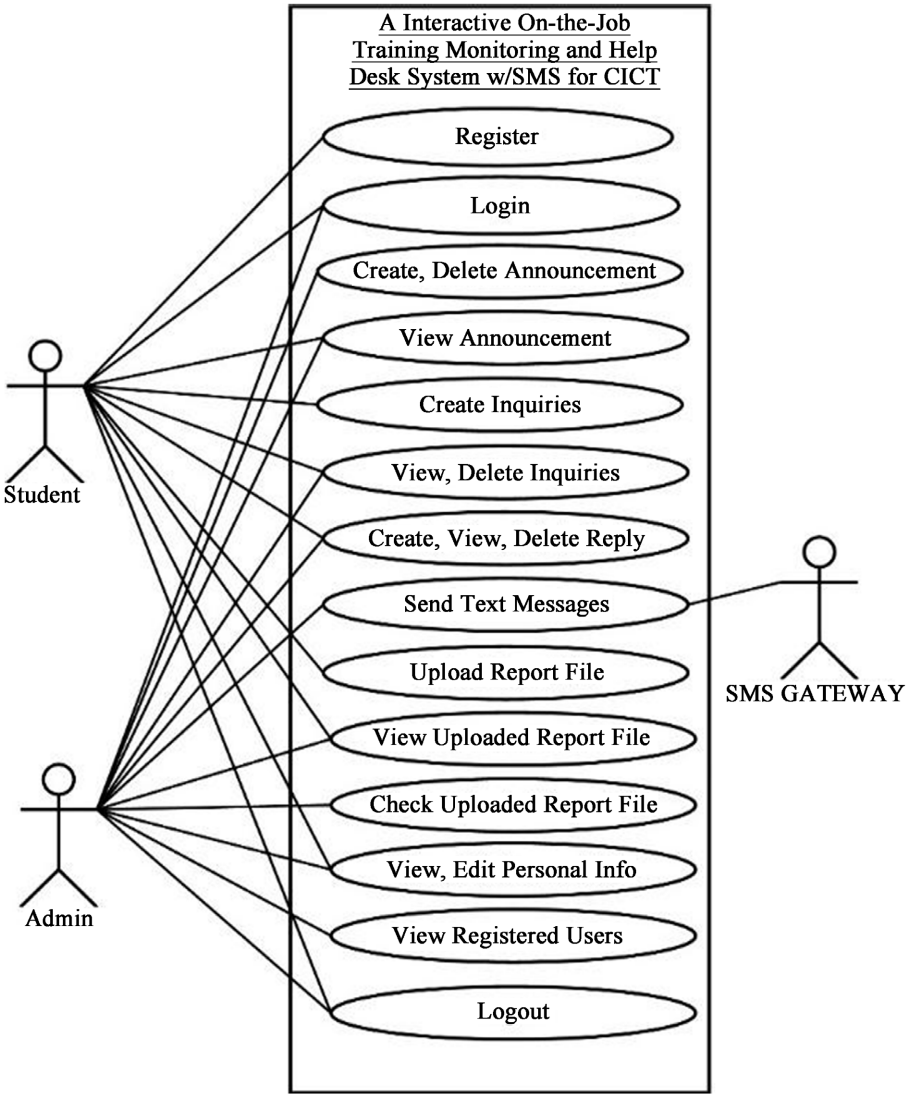

Figure 5. Use case.

1) The proponent used up all their programming knowledge to develop the proposed system. The project is a web-based system that is developed using Hypertext Markup Language 5 (HTML5), Cascading Style Sheets (CSS), Bootstrap, JavaScript, and jQuery for the front-end development and PHP Hypertext Preprocessor (PHP) and MySQL for the back-end development.

2) For the integration of Short Message Service (SMS) in the system, the researcher used a Short Message Service (SMS) Gateway Application Programming Interface (API) to handle the sending of announcements and information.

3) For the Graphical User Interface of the Online Interactive OJT Help Desk and Monitoring System with SMS shown in **Figure 6** and **Figure 7**, Homepage or the Login Page and the Registration Page where students and coordinator will register their credentials to be able to log in in the system.

Shown in **Figure 8** and **Figure 9** are the announcement pages where coordinator will post their intended announcement with the student taking up OJT courses.

Figure 6. Home page/log in page.

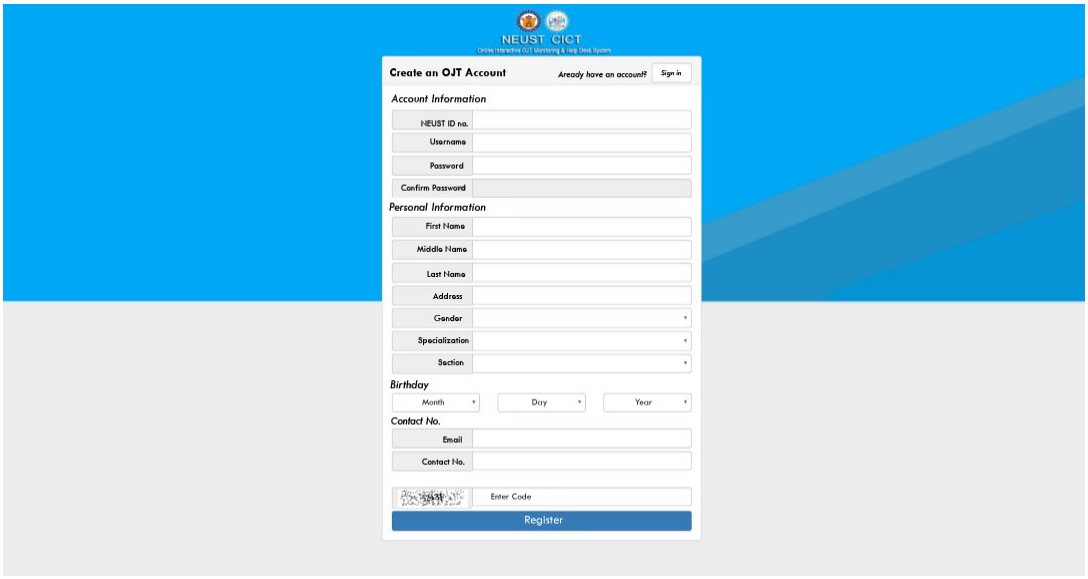

Figure 7. Registration form.

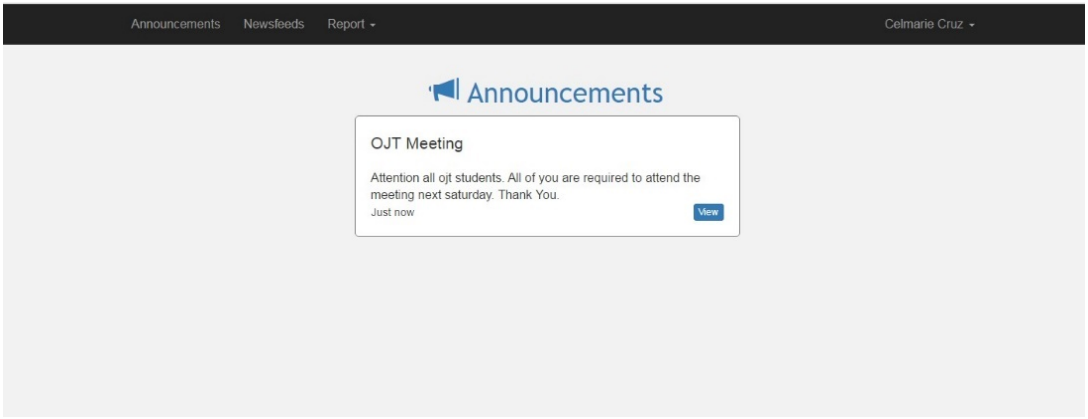

Figure 8. Announcement page.

Shown in Figure 10 and Figure 11 are the Inquiry page the new feed posts the different queries about the OJT and students at the same time can ask the question, if any.

Shown in Figure 12 is the PDF Report File Submission where a student will upload their weekly report or any permanent documents related to OJT course.

Shown in Figure 13 the Weekly Report Compilation where the OJT Coordinator will view the submitted report of the student.

2.5. Testing

The following activities were accomplished during the coding phase:

1) Reviewing for accurate spelling and proofreading content including page titles.

2) Checking links to ensure that they are not broken and are linked correctly

3) Checking graphics to confirm they display properly and are linked correctly.

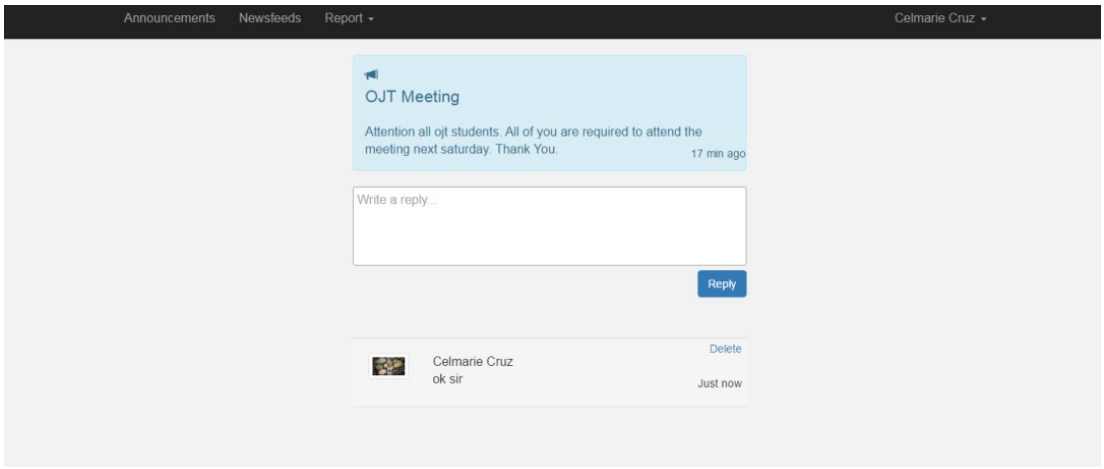

Figure 9. Announcement content.

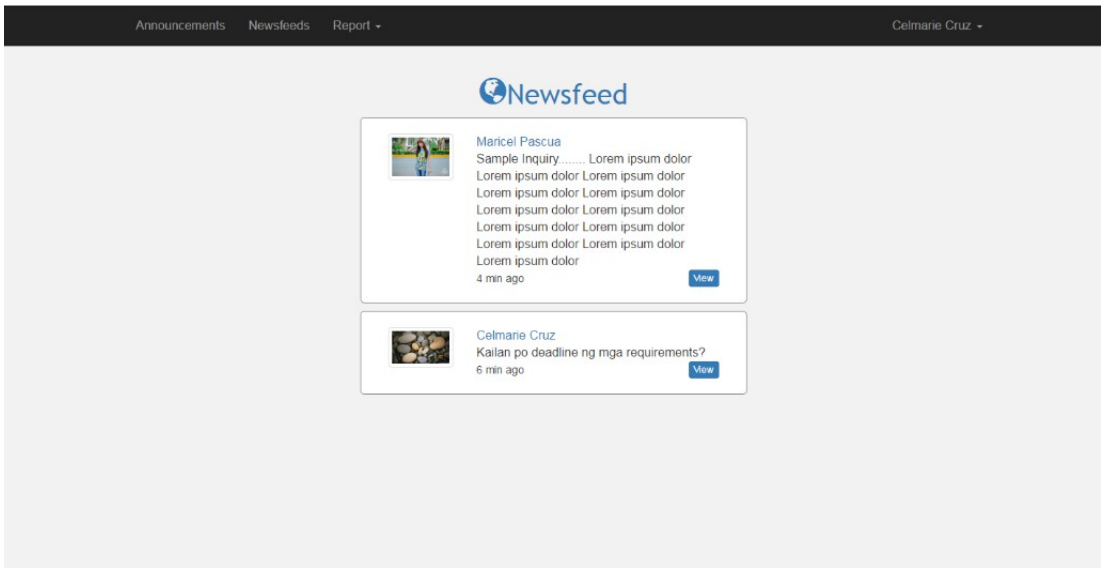

Figure 10. News feed page.

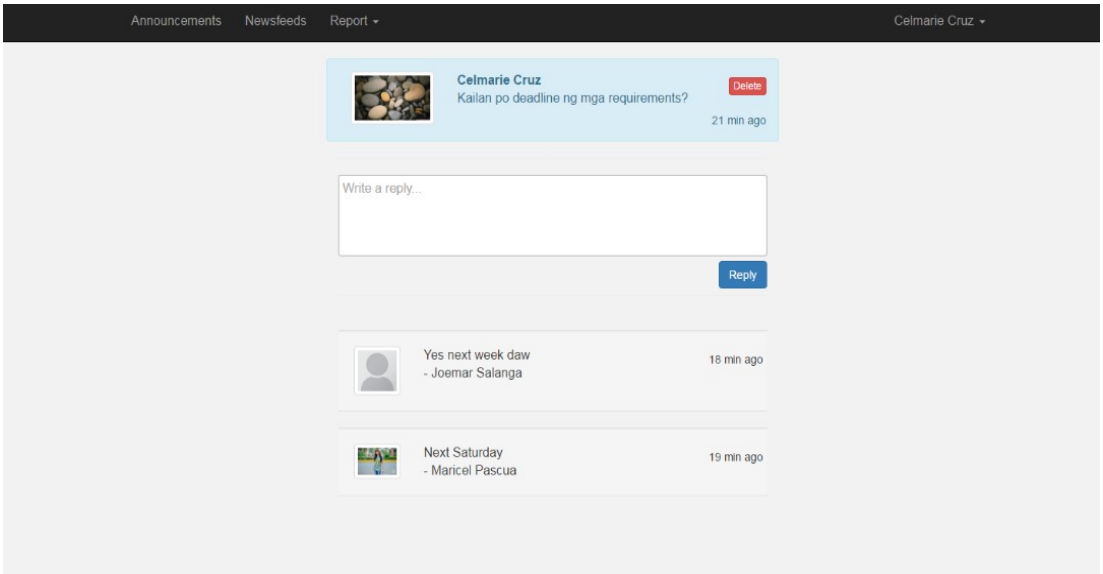

Figure 11. Inquiry content.

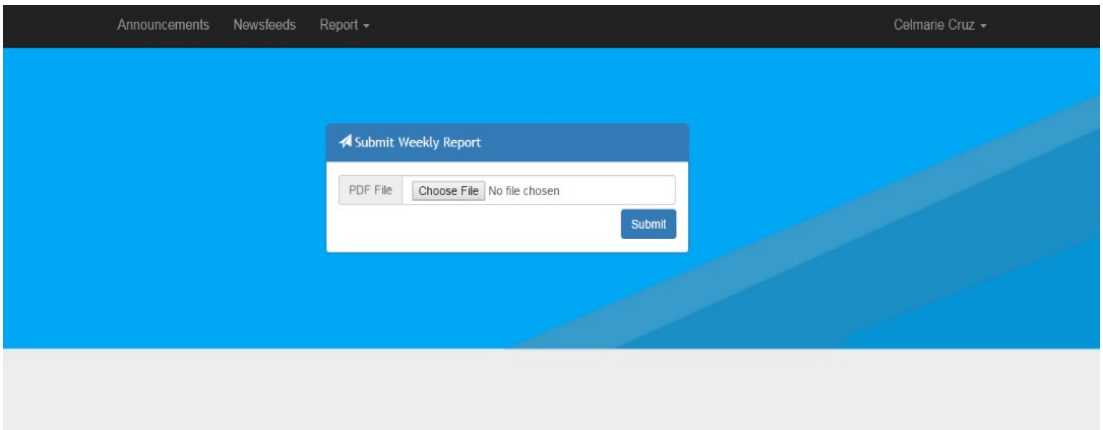

Figure 12. PDF report file submission.

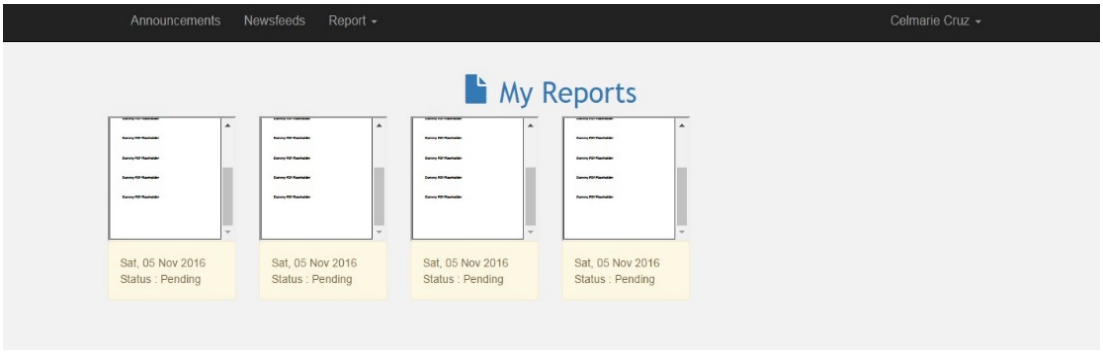

Figure 13. Weekly report compilation.

4) Testing forms and other interactive page elements.

5) Testing pages to check for speed of loading on lower speed connection.

6) Testing each Web in different browser types and versions to verify they display correctly.

2.6. Implementation

Implementation of a Web site means publishing the Web site or uploading it to a Web server. The proponent will publish the website on a web server allowing the students taking the OJT course to use the system. The Graphical User Interface (GUI) of the Interactive On-the-Job Training Monitoring and Help Desk System with SMS for the College of Information and Communication Technology is shown in Figure 14 research process.

Shown below that the Interactive On-the-Job Training Monitoring and Help Desk System with SMS is a stand-alone application and can be accessed through the website. Within the Interactive On-the-Job Training Monitoring and Help Desk System with SMS, the coordinator can enroll the students, add requirements and check submitted requirements. Students in turn are enabled to view OJT requirements, submit OJT requirements and view their status.

2.7. Maintenance

The following activities were accomplished during the Maintenance phase:

1) Mismatched links that have gone unnoticed were modified.

2) Errors in the content observed by the users were modified.

3) Some changes were made based on the suggestions of the users who have tried browsing the sites.

3. Assessment

The assessment was based on the four web characteristics, namely, accessibility, understandability, portability, and security. **Tables 1-4** show the results of the assessment of the respondents.

3.1. Accessibility

Table 1 shows the items "maintains standard layout and navigation method throughout the website", "user is able to move around within site with ease", and "the links to other pages within site are helpful and appropriate". Their assessments had a verbal interpretation of "Strongly Agree" according to the evaluation

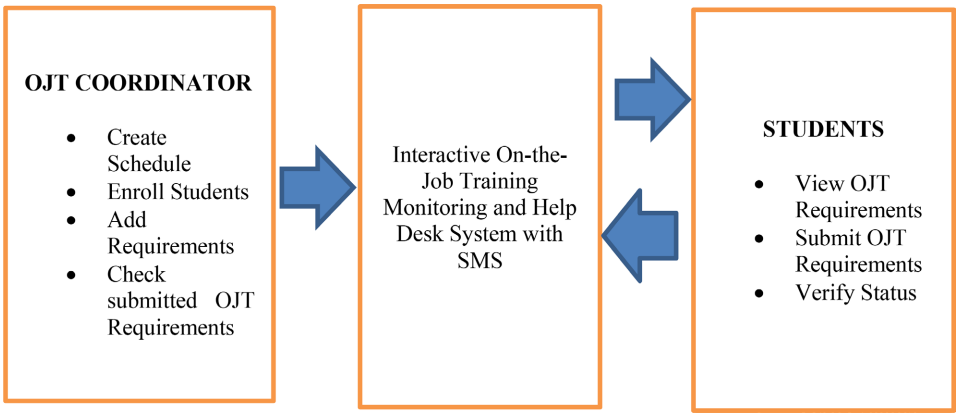

Figure 14. Research process.

of the groups of respondents.

These assessments mean that the proposed OJT Monitoring and help desk system is accessible, well designed, developed and edited.

3.2. Understandability

Table 2 shows the assessment of the items under understandability as follows: "the text content is readable and understandable", "the information is clearly labeled and organized", and "graphics and files are clearly identified". Their assessments had a verbal interpretation of "**Strongly Agree**" according to the evaluation of the groups of respondents.

3.3. Portability

Table 3 shows the assessment on the items under portability as follows: "Site can be browsed with latest versions of browser", "Site can be viewed with a different type of device", "site is flexible that it could meet the requirements and limitations of the NEUST, CICT office". Their assessments had a verbal interpretation of "**Strongly Agree**" according to the assessment of the groups of respondents.

The respondents found that OJT Monitoring and help desk system was portable

Table 1. Assessment on accessibility of the website.

Web site Characteristics	Respondents				
	OJT Students		OJT Coordinator		Verbal interpretation
1.0 Accessibility	**WM**	**VI**	**WM**	**VI**	
1.1 Maintains standard layout and navigation method throughout the website.	4.9	SA	4.4	SA	Strongly Agree
1.2 User is able to move around within the site with ease.	4.9	SA	4.9	SA	Strongly Agree
1.3 The links to other pages within the site are helpful and appropriate.	4.8	SA	4.2	SA	Strongly Agree
Average Mean	4.86	SA	4.50	SA	Strongly Agree

Table 2. Assessment on understandability of the website

2.0 Understandability	**WM**	**VI**	**WM**	**VI**	**Verbal interpretation**
2.1 The text content is readable and understandable.	5	SA	4.8	SA	Strongly Agree
2.2 The information is clearly labeled and organized.	4.8	SA	4.7	SA	Strongly Agree
2.3 Graphics and files are clearly identified.	4.9	SA	4.8	SA	Strongly Agree
Average Mean	4.9	SA	4.76	SA	Strongly Agree

enough to be accessed using the latest versions of browsers and different types of devices and met the requirements and limitations of the NEUST CICT department.

3.4. Security

Table 4 shows the assessment of the items under security as follows: "Account is secured by password", "Verifies the authenticity of the user", and "Non-members cannot view, edit and delete restricted information". Their assessments had a verbal interpretation of "**Strongly Agree**" according to the assessment of the groups of respondents.

The respondents found that OJT Monitoring and help desk system is secure

Table 3. Assessment on portability of the website.

3.0 Portability	WM	VI	WM	VI	Verbal interpretation
3.1 Site can be browsed with latest versions of browser	4.8	SA	4.7	SA	Strongly Agree
3.2 Site can be viewed with different type of device	4.9	SA	4.9	SA	Strongly Agree
3.3 Site is flexible that it could meet the requirements and limitations of the NEUST, CICT office	4.9	SA	4.7	SA	Strongly Agree
Average Mean	4.86	SA	4.76	SA	Strongly Agree

Table 4. Assessment on security of the website.

4.0 Security	WM	VI	WM	VI	Verbal interpretation
4.1 Account is secured by password	5	SA	5	SA	Strongly Agree
4.2 Verifies the authenticity of the user	5	SA	5	SA	Strongly Agree
4.3 Non-members cannot view, edit and delete restricted information	5	SA	4.9	SA	Strongly Agree
Average Mean	5	SA	4.96	SA	Strongly Agree

Table 5. Summary of result.

Web site Characteristic	Respondents				Verbal Interpretation
	OJT Students		OJT Coordinator		
	WM	VI	WM	VI	
1.0 Accessibility	4.86	SA	4.50	SA	Strongly Agree
2.0 Understandability	4.9	SA	4.76	SA	Strongly Agree
3.0 Portability	4.86	SA	4.76	SA	Strongly Agree
4.0 Security	4.90	SA	4.96	SA	Strongly Agree
Average Mean	4.90	SA	4.74	SA	Strongly Agree

enough to use as online submission of weekly reports and handle each user's account and information.

Table 5 shows the summary of results from the two groups of respondents. The OJT students had an overall weighted mean of—and—weighted mean from OJT coordinators.

4. Conclusions

The project aims to gratify the following goals and objectives:

- To provide a useful system for the OJT students that will minimize the time, effort, and money they spend in submitting their weekly reports.
- To improve the process of keeping the weekly reports submitted by the student by collecting the files through an online system.
- The integration of SMS functionality to the system for immediate sending of important information/announcements to OJT students.
- An online system that can be used by the OJT students to post their inquiries regarding the OJT course.
- To make communication between the OJT students and coordinators with ease by using the online help desk.

From the finished output of the project, the proponent, therefore, concluded that the proposed project is specifically checked and given suggestions for any changes and improvements from the evaluator. All gathered data were used and all objectives were successfully accomplished by having an interactive OJT monitoring and help desk system that the College of Information and Communication Technology (CICT) in Nueva Ecija University of Science and Technology (NEUST) could use to send and posting OJT-related announcements to the students, letting the students inquire through the website, viewing those posted announcements and inquiries, uploading a weekly report, and checking all the student's weekly report.

Acknowledgements

The author wishes to acknowledge and extend their sincere appreciation to the: 1) Participants of this study; 2) College of Information and Communications Technology. She would also like to extend their most profound gratitude to all those who had, directly and indirectly, contributed to the conduct of this noble undertaking.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix A. Data Dictionary

Field Name	Data Type/ Range	Size	Description	Reference
user_id	Int	4	Primary Key for user table	user table
Uname	Varchar	32	User name of the system administrator or students	user table
Password	Varchar	32	Password of the system administrator or students	user table
user_type	Int	1	Type of users in the system, it can be the OJT coordinator or OJT students	user table
ui_id	Int	4	Primary Key for user information table	user_info table
Fname	Varchar	50	First name of the system end-user	user_info table
Mname	Varchar	50	Middle name of the system end-user	user_info table
Lname	Varchar	50	Last name of the system end-user	user_info table
Bday	Date	--	Birthday of the system end-user	user_info table
Gender	Char	1	Gender of the system end-user, either male or female	user_info table
Address	Varchar	255	Address of the system end-user	user_info table
contact number	Varchar	11	Contact number of the system end-user	user_info table
Specialization	char	3	Specialization of the system end-user, it can be Web Applications Programming, Database Applications Programming, Network Analysis and Design	user_info table
Section	char	1	Section of the system end-user	user_info table
Email	varchar	100	Email of the system end-user	user_info table
announce_id	int	5	Primary Key for Announcement table	announce table
announce_date	datetime	--	Date and time when the announcement was posted	announce table
announce_subject	varchar	100	Subject or title of the announcement	announce table
announce_content	text	--	Content of the announcement	announce table
ar_id	int	5	Primary Key for announcement reply table	announce_reply table
reply_date	Datetime	--	Date and time when the reply for the announcement was posted	announce_reply table
reply_content	text	--	Content of the reply for the announcement	announce_reply table
inquiry_id	int	5	Primary Key for inquiry table	inquiry table
inquiry_date	datetime	--	Date and time when the inquiry of the student was posted	inquiry table
inquiry_content	Text	--	Content of the student's inquiry	inquiry table
ir_id	Int	8	Primary Key for inquiry reply table	inquiry_reply table
reply_date	Datetime	--	Date and time when the reply for the inquiry was posted	inquiry_reply table
reply_content	Varchar	--	Content of the reply for the inquiry	inquiry_reply table
report_id	Int	8	Primary Key for report table	report table
report_date	Datetime	--	Date and time when the report was uploaded	report table
report_filename	Varchar	255	File name of the student's report	report table

Continued

report_status	Int	1	Status of student's report, either checked or pending	report table
company_id	Int	5	Primary Key for company table	company table
company_name	Varchar	255	Name of the company	company table
company_address	Varchar	255	Address of the company	company table