

Examination Management System

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Date Submitted:

March 20, 2026

Date Accepted:

May 15, 2026

Date Published:

July 28, 2026

DOI:

10.5281/zenodo.21639841

ABSTRACT

The main purpose of this study was to provide an efficient and easy way of giving an Examination at Estancia National High School. The main goal of this online examination system is to effectively evaluate the student thoroughly through a totally automated system that not only reduce the required time but also obtain fast and accurate results. Students who are enrolled at the Estancia National High School are required to take Examination in an automated way, for the results of exam, the developed system that includes subjects, exam scheme, evaluation patterns, grading criteria, record mark entry and result calculation. Examination Management System automates the activities carried around the Examination process. It manages all the details of examination, student and subjects. The proposed

system is totally built at administrative end and thus only the administrator is guaranteed the access. This system is also highly interactive and user friendly.

Keywords: *Examination Management System, Exam Scheduling, Administrator, Automated Grading*

INTRODUCTION

Examination Management System is developed for the students who take exams in school campuses, Universities and Institutes. It facilitates to access the examination information of a particular student in a particular class. It is a device that will change the method of observation of a teacher to a particular student during examination. The device is most recommended for those pregnant, getting old teachers and for disabled teachers.

The impact that technology as had on today's schools has been quite significant. This widespread adoption of technology has completely changed how teachers teach and students learn. Teachers are learning how to teach with emerging technologies (tablets, iPods, Smart Boards, Digital cameras, computer) while students are using advanced technology to shape how they learn by embracing and integrating technology in the classroom, we are setting our students up for a successful life outside of school (Leitz, 2016).

Examination Management System is one of the tools of the Senior High Department to assess the learning of learners as their admission on the said department. Giving of the Examination Management System to students is administered by Senior High School core faculties, one seat apart is the space required for every student before the giving of test questionnaires. Checking of paper is done manually and giving examination is time consuming and tiring to the Senior High School core faculties.

The study focused on reducing the manual work as it saves the time that will take to set the examination, check the paper and prepare mark sheets. The authenticity is maintained by administrator so that there is no chance of leakage of question papers. The system generates the result as soon as the test is finished. Administrator can insert, modify and delete the information available and can also access all the accounts of teachers and students. Teachers can view the test conducted by students and also can view their marks.

With these observations, the researcher would like to create an Examination Management System that allows students or trainees to do exercise or tests through computer. It not only reduces the workload of teachers, but also achieves the objectivity and impartiality of examination.

Objectives of the Study

This study aimed to develop an Examination Management System.

Specifically, this study aimed to:

1. Design a system that will;
 - a) automate the examination process;
 - b) accept and manipulates student's data;
 - c) automatically display the results of examination once the students is admitted in a program;
 - d) automatically display the time duration and remaining test questions during examination.
 - e) displayed test questions randomly;
 - f) generate results and percentage of the exam;
 - g) generate scores of the students during examination
2. Determine the quality of the developed system based on Mc Call's Software Quality Model;
3. Evaluate the system based on the five (5) characteristics from ISO 25010 Quality in use: Effectiveness, Efficiency, Satisfaction, Safety, and Usability.

Scope and Limitation of the Study

This study developed an Examination Management System for the Senior High School at Estancia National High School in order to help the Senior High School core faculties to give the Examination in an easiest way, not to waste time for computing the score of examinees.

The subjects of the study will be randomly selected by Senior High School core faculty and the senior high school students at the Estancia National High School, Estancia, Iloilo.

This study employed developmental research method that focused on the development of the information system and descriptive research to subsequently evaluate the processes based on specific criteria.

The respondents of this study were the students of Senior High School at Estancia National High School.

Significance of the Study

This study is a great help for the improvement of the current process of giving the examination at the SHS ENHS. The benefits of the developed system will surely help the following:

Students. The results of this study will be useful for the students as they could provide a fair examination time and they start all the same time. Easy for them because they will no longer used ballpen and papers, and also, they will not wait too long in receiving the test result.

SHS Faculty. The results of this study can save time, costs and manpower to the faculty. The task of the faculty can be more convenient and efficient in giving examination. Publish and deliver exam results instantly. Checking of papers manually will be no longer a problem.

Universities/School Campus. The results of this study can eliminate conflict with dynamic scheduling and invigilators. Capture and track incidents of students' misconduct real time.

Researcher. The study would be useful to her as it would serve as an additional knowledge about Examination Management System.

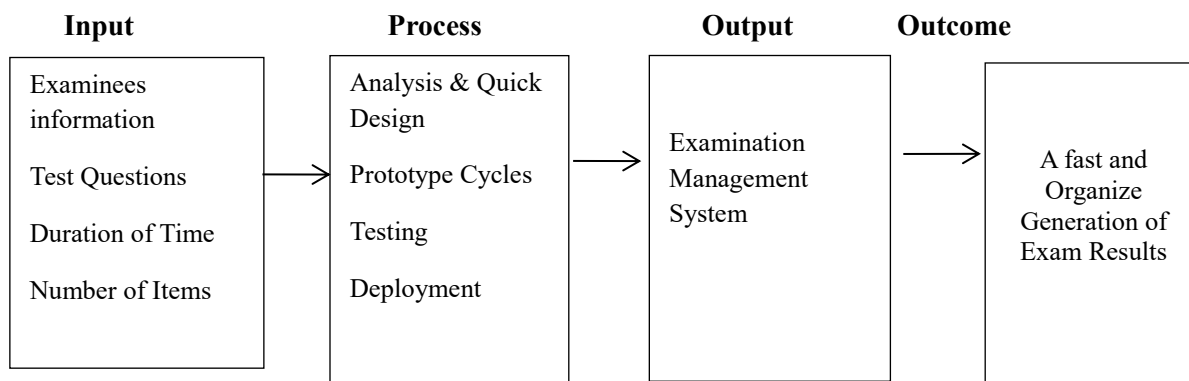
Future Researchers. This study would benefit the future researchers as they could use this study as a guide and bases in conducting further study, concerning Examination Management System.

Conceptual Framework

This study was conceptualized and developed an Examination Management System comprising of input phase, process and output phase. As such, the inputs of the study are the examinee information, examination information and Duration Time and Number of Items.

The process involved the development of an Examination Management System. The output of the study includes the evaluation of the developed system as to the level of functionality, usability and level of performance efficiency.

Figure 1. shows the Conceptual Framework of the study.



METHODS

Research Design

Software Design and Development Component

Software Life Cycle Model

A methodology (RAD) be applied to respond to the needs to deliver systems very fast. The project scope determined its size and circumstances that surround it. Thus, the diagram in Figure 2.0 depicts the dependency relationships between the stages in the RAD.

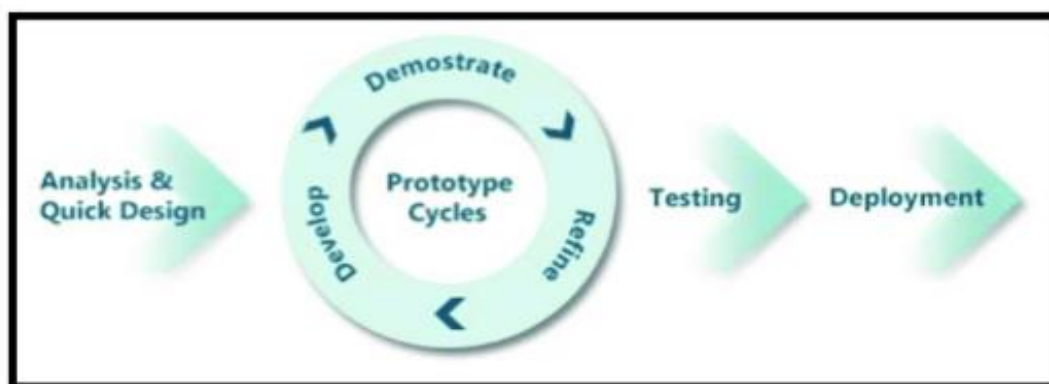


Figure 2.0 Rapid Application Development Model

Software Development Phases

The Software Development Phases for Rapid Application Development (RAD) includes Requirements Planning, User Design, Construction, Testing, and Deployment.

A. Analysis and Quick Design

This phase determined the current needs of the study and the best approach to be made during the development of the Examination Management System. The results of this phase helped the researcher select the best tools for the improvement and a concrete solution to the process needed for the system as a whole.

Context Flow Diagram

A context diagram is a data flow diagram that only shows the top-level known as Level 0. At this point, there is only one visible process node that represents the functions of a complete system in regards to how it links with external entities. The context flow diagram in this study identifies and explains the process of the Examination Management System to understand the concept of the system application fully.

Data Flow Diagram

The Data Flow Diagram in figure 3, illustrates the overall explanation and the process of the Examination Management System. It is for the user to know its functionality and sequence.

The primary user registers on the application for user profiling and shows their profile to all application users. If the user has already registered on the system application, then they have access to the Examination Management System. In administration, the administrator can create an exam, register students, view and manipulate data.

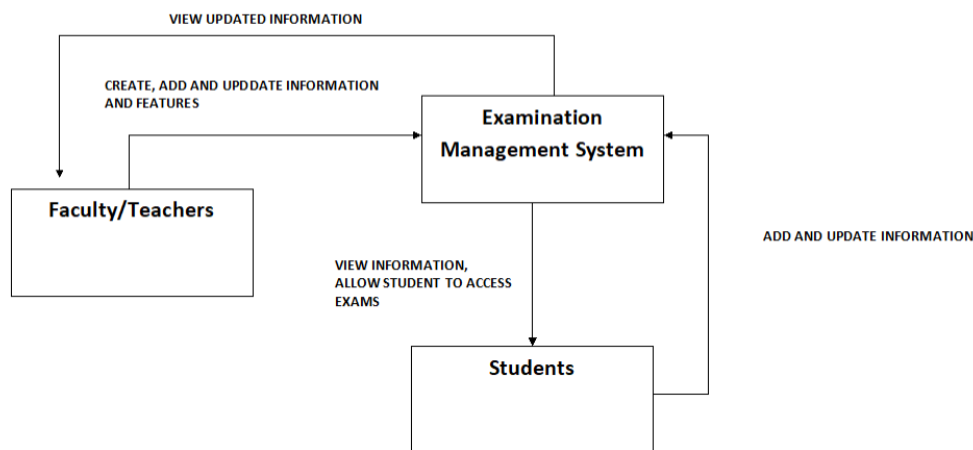


Figure 3.0 *Data Flow Diagram*

The ER Diagram

The entity-relationship (ER) model and its accompanying ER diagrams in Figure 4 are widely used for database design and systems analysis. The ERD illustrates the overall explanation and how an entity in the Examination Management System databases are connected.

The user may register to the app; if the user has already registered on the system application, then they have access to the Examination Management System. In administration, the administrator can view details of all information regarding the creation of an exam, register students, view and manipulate data.

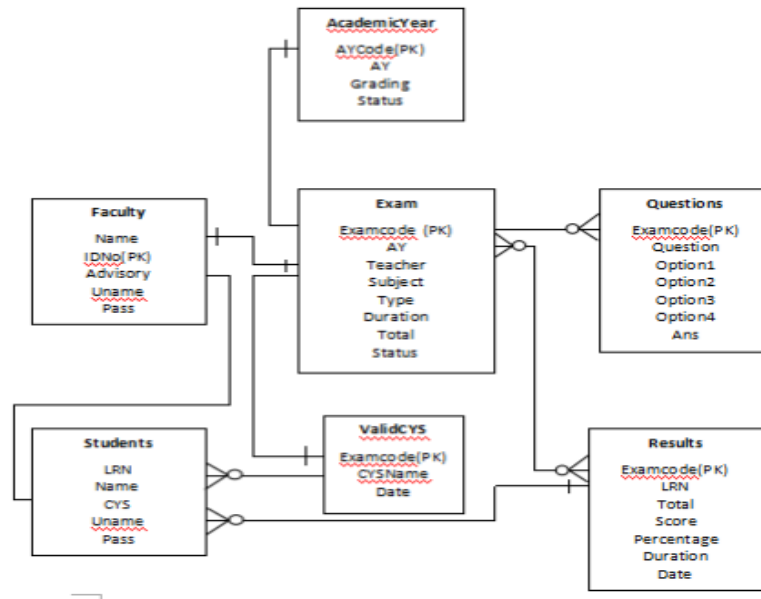


Figure 4.0 ER Diagram

The Application Architecture

The Application Architecture for Examination Management System illustrates the overall process of the system. A well-designed user interface is understandable and manageable, serving users to complete their work effectively and competently, and to feel capable and fulfilled.

The admin user that uses the application may register. The app does not Internet to connect and display the data through a channel, which is a database server. In administration, the administrator can create an exam, register students, view and manipulate data.

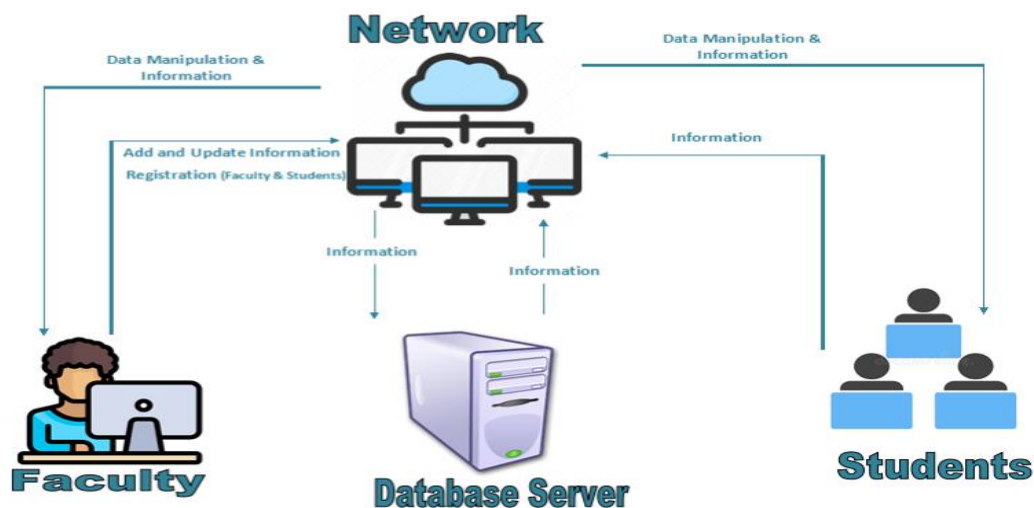


Figure 5.0 Application Architecture for Examination Management System

B. Prototype Cycles (Build, Demonstrate, Refine)

After the Quick Design has been accomplished and approved, the researcher forms the system for the user needs. In constructing the system, the developer undergoes a series of iteration from the build, demonstrates the system to the user, and refine the system if the user is not satisfied with the output of the system application. In-line with this, the developer has the opportunity to complete and make sure that the system is function is 100%.

Hardware and Software Requirements

The system was an application-based system with client and admin side which does not require a network infrastructure for managing its contents. The system intended to the users a user-friendly interface. Furthermore, application-based system with the admin and client side that setup the structure.

Thus, to ensure optimal performance and compatibility, the following hardware and software requirements are required:

Table 1. *Hardware Requirements*

Hardware	Specification
CPU	intel Core i3
RAM	4GB
ROM	250mb free
Screen Size	HD+ or higher
Operating System	Windows 7 and above version

Table 2. *Server Requirements*

Software	Version
Microsoft SQL Server	V.18
Visual Studio	V.2012 and above
C#	V.12 and above

Prototype Design and Development

This phase of the research played a vital role in the direction of the system. And based on the needs of the user. The gathered data carefully analyzed and developed into understandable diagrams and process flow for the system. The system comprises the admin side and client-side component. As to the Admin side and Client side, the design developed by the researcher for modularity and the maintainable system overall. In admin side, the user is the faculty. In the client side, the user is the students.

The system was developed using the C# scripting language for all the transactions and processes and utilized the Visual Studio Database for the data management of the system. A Microsoft SQL Server used to deploy the system, and the researcher developed the system for better scalability and availability.

C. Testing Phase

This phase determined the performance and functionality of each feature of the system on how it works. This phase prepared system a production environment. All issues, concerns, and suggestions of the users put into consideration before deploying as to avoid malfunctions during actual operation. This let the administration and clients not hesitant to use the system.

D. Deployment Phase

Upon completion of the testing, the system Examination Management System deploys in Estancia National High School in Brgy. Tacbuyan, Estancia, Iloilo. Initial configuration made to see to it that the accounts were available, all features were working.

E. Implementation Phase

In the Implementation Phase, Performance and viability prototypes are used for the same purposes as in the design phase but would characteristically be more excellently focused. Prototypes also are used in the implementation phase to begin training users before the system fully implemented and to test the system.

Table 3. *Cost-Benefit Analysis*

Examination Management System	Time frame	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Cost							
Software	50000						
Labor/Training	5000						
Maintenance		700	700	700	700	700	700
Cumulative Cost	55000	55700	56400	57100	57800	58500	59200
Benefit							
Buyer Time Saved		24000	24000	24000	24000	24000	24000
Cumulative Benefits		24000	48000	72000	96000	120000	144000
Cumulative Cost	55000	31700	8400	14900	38200	61500	84800
Benefits-Cumulative							

One of the main ways people make decisions is by using a cost benefit analysis (CBA). For the cost, development of the system Examination Management System cost ₱ 50,000.00 with training fee of 5,000.00. Monthly maintenance of the system cost 700.00 per month for six months. For the benefit, buyer can save money by using the application-based system. Buyer can save 24000 monthly for six months by directly contacting seller. For the software to be successful benefit must be greater than cost. Based on the table, after three (3) months the software have it return of investment.

RESULTS AND DISCUSSION

Table 4 *The Quality of the Developed System Based on Mc Calls Software Quality Model as rated by the Experts*

Criteria	Expert 1	Expert 2	Expert 3	MEAN	Interpretation
Auditability The ease with which conformance to standards can be checked.	5	4	5	4.6	Excellent
Accuracy The precision of computations and control	5	5	4	4.6	Excellent
Completeness The degree to which full implementation of the required functions has been achieved.	5	5	5	5	Excellent
Communication Commonality The degree to which standards interfaces and protocols are understood.	5	5	5	5	Excellent
Conciseness	5	4	5	4.6	Excellent

The compactness of the program in terms of lines and code.					
Consistency	5	5	5	5	Excellent
The use of uniform design and documentation techniques throughout the software development project.					
Observability	5	4	5	4.6	Excellent
The process of streaming the software components can be easily identified and understand.					
Operability	5	5	4	4.6	Excellent
The ease of operation of the program.					
Security	5	5	5	5	Excellent
The availability of mechanisms that control or protect programs and data.					
Self-Documentation	5	5	5	5	Excellent
The degree to which the source code provides meaningful documentation.					
Simplicity	5	4	5	4.6	Excellent
The degree to which the program can be understood without difficulty.					
Software System Independence	5	5	5	5	Excellent
The degree to which the program is independent of non-standard programming language features, operating system characteristics, and other environmental constraints.					
Traceability	5	4	5	4.6	Excellent
The ability to trace a design representation or actual program component back to requirements.					
Training	4	5	5	4.6	Excellent
The degree to which the software assists in enabling new users to apply the system.					
Controllability	5	4	5	4.6	Excellent
The system can be easily controlled and manipulated in terms of execution, program structure, and design.					
Data Commonality	5	5	4	4.6	Excellent
The use of standard data structures and types throughout the program.					
Decomposability	5	5	5	5	Excellent
The software is built from series of modules, and can be tested independently.					

Error Tolerance The damage that occurs when the program encounters an error.	5	5	5	5	Excellent
Execution Efficiency The run-time performance of the program.	5	5	5	5	Excellent
Expandability The degree to which architectural, data, or procedural design can be extended.	5	5	5	5	Excellent
Generality The breadth of potential application of program components.	5	4	5	4.6	Excellent
Hardware Independence The degree to which the software is decoupled from the hardware on which it operates.	4	5	5	4.6	Excellent
Instrumentation The degree to which the program monitors its own operation and identifies errors that do occur.	5	4	5	4.6	Excellent
Modularity The functional independence of program components.	5	5	4	4.6	Excellent
Grand Mean				4.95	Excellent

Rating Scale: [5] Very Good [4] Good [3] Average [2] Fair [1] Poor

Table 4 shows the result of the mean for the respondent's feedbacks on the level of functionality of developed system in terms of suitability, accurateness and security. Functionality is essential purpose of any service for the certain items this is relatively easy to define. Suitability is the essential functionality characteristics and refers to the appropriateness of functions of the software. Accurateness refers to the correctness of the functions. Security refers to the unauthorized access to software functions.

The results showed above indicated that the Examination Management System, in the level of functionality in terms of suitability had a mean value of 4.77 which was verbally interpreted as "Excellent". The accurateness had a mean value that was computed as 4.81 which was interpreted as "Excellent" while its security had yielded a mean of 4.82 which was described as "Excellent".

Table 2.0 System Evaluation Result Based on the Five (5) Characteristics from ISO 25010 Quality in Use as Rated by the Client

Criteria	Overall Mean	Interpretation
Effectiveness	5.0	Excellent
Efficiency	5.0	Excellent
Satisfaction	4.9	Excellent
Safety	4.8	Excellent
Usability	5.0	Excellent

Table 2 presented the mean for the level of Usability of the Examination Management System in terms of effectiveness, efficiency, satisfaction, safety and usability. The level of effectiveness is to achieve its objectives within its specific environment. The level of Usability only exists with regard to functionality and refers to the ease of use for a given function. Understandability determines the ease of which the systems functions can be understood. The level of efficiency signifies the peak level of performance that uses the least amount of inputs to achieve the highest amount of output. The level of satisfaction refers to the attitude of a user to the computer system. The level of safety is useful in demonstrating adequacy of technologies when difficulties are faced with risk analysis. And the level of usability refers to the ease if use and learnability of the system.

The result showed that the usability of Entrance Examination System in terms of effectiveness had a mean value 5.0 which was interpreted as “Excellent”, for the Efficiency it yielded a mean value of 5.0 which was being interpreted as “Excellent”, for the Satisfaction had a mean value of 4.9 which was interpreted as “Excellent”, for the Safety had a mean value of 4.8 which was interpreted as “Excellent”, for the Usability had a mean value of 5.0 which was interpreted as “Excellent”.

Table 5 Result of User Satisfaction Survey

Criteria	Overall Mean	Interpretation
The system can manipulate information and data of students	5.0	Strongly Agree
The system can create test questions	4.9	Strongly Agree
The system can display list of students	4.9	Strongly Agree
The system can identify students score and percentage	5.0	Strongly Agree
The system can identify the duration of time	5.0	Strongly Agree

Table 5 presented the mean for the level of Performance Efficiency of the Examination Management System with in terms of time behavior and Resource Utilization. The level of Performance Efficiency is the characteristic concerned with the system resources used when providing the required functionality.

The result showed that the different criteria of the Examination Management System yielded overall mean value of 4.96 which was being interpreted as “Strongly Agree”.

CONCLUSION

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

The level of functionality of the Examination Management System in terms of suitability was verbally interpreted as “Excellent”. The accurateness was also interpreted as “Excellent”. Similarly, with the security yielded on interpretation as “Excellent”. The respondents believe that the suitability is excellent because the system perform the task that is required and display a message that informs them to do some specific tasks. And also, the information is clear such as on-screen messages that is why they can easily follow the flow of the examination. They also believe that the accurateness is excellent because the system provides exact information such as questions which were displayed in correct and organize way. Then the result given by the system was precise which are all based in what the system reads and also it performs the operation correctly. Similarly, the security yielded by the respondents as excellent because they can only access their account using the login account which consists of passwords that is protected using mask character that’s why when they enter their account details, they are the only one who knows it.

The Examination Management System was able to provide a high level of functionality due to its suitability, accurateness and security. The level of usability of the Examination Management System in terms of understandability was interpreted as “Excellent”, same with the operability. The respondents believe that the understandability is excellent because they clearly understand the system flow of the process. And also there is an

on-screen message that were provided by the system that was stated clearly. They also believe that the operability of system is excellent because they were satisfied on how the system works and it was easy to use. And also, they can easily find the information they needed.

The Examination Management System was able to provide a high level of usability due to its understandability and operability. The level of performance efficiency of the Examination Management System in terms of time behavior was interpreted as “Excellent”, same with the resource utilization. The respondents believe that the time behavior is excellent because the system was able to complete the task in a fast manner. Also, they didn’t experience system lag during the examination and lastly, the system provided a real-time information. They also believe that the resource utilization of system is excellent because the system can be installed in a low to mid-range computer. It was also functional according to its operational requirements.

The Examination Management System was able to provide a high level of performance efficiency due to its time behavior and resource utilization.

References

- Bejerano, Y., Breitbart, Y., Garofalakis, M. and Rastogi R. (2003). Physical Topology Discovery for Large Multisubnet Networks. In *Proceedings IEEE INFCOM 2003*, San Francisco, CA, USA. DOI 10.1109/INFCOM.2003.1208686
- Coronel, C. and Morris, S. (2009). What is SDLC? Retrieved from <https://airbrake.io/blog/sdlc/what-is-the-software-development-life-cycle>
- Entrance Exam. (2018). Retrieved from <https://thefreedictionary.com>
- Essays, UK. (November 2013). Web Based Information Systems. Retrieved from <https://www.ukessays.com/essays/information-systems/web-based-information-systems.php?vref=1>
- Examinees. (2018). Retrieved from <https://www.merriam-webster.com>
- Fred, S. (2018). Automated Examination Management System. Retrieved from <https://www.scribd.com/doc/299843217/Chapter-1-LCUP-Automated-Examination-System>
- Gite, V. (2006). What is the Role of System Administrator? Retrieved from <https://www.cyberciti.biz/faq/what-is-the-role-of-the-system-administrator/>
- Johnson, P.(2017). Rapid Application Development. Retrieved from <http://www.hokuapps.com/blogs/rapid-application-development>
- Leitz, J. (2016). Technology in the Classroom. Retrieved from www.teachHub.com
- Posinasseti, N.(2014). Descriptive research design. Retrieved from <http://www-researchgate-net.cdn.ampproject.org/v/s/www.researchgate.net/post/>
- Rouse, M. (2005). System. Retrieved from <https://searchwindowsserver.techtarget.com/definition/system>
- System Administrator. (2017). Retrieved from <https://www.techopedia.com/definition/4815/system-administrator-sa>
- Villalobos, A. J. T., Flejoles, R. P. & Dionio, I. M. (2012). Enhanced Entrance Examination System of John B. Lacson Foundation Maritime University Using Java and MySQL. Retrieved from https://www.academia.edu/4976966/ExaminationManagemnetSystem_of_John_.Lacson_Foundation_Maritime_University_Using_Java_and_MySQL