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## ONLINE TERTIARY SCHOOLS MANPOWER MONITORING SYSTEM FOR COMMISSION ON HIGHER EDUCATION (CHED) REGION V

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**JESUS C. CILLAN JR.** (*Researcher*)  
**JOSEFINA R. SARMIENTO** (*Adviser*)

AEMILIANUM COLLEGE INC.  
Rizal St., Piot, West District, Sorsogon City, Sorsogon, Philippines

**Abstract.** The Online Tertiary Schools Manpower Monitoring System using Dynamic System Development Methodology is an important initiative designed specifically for the Commission on Higher Education (CHED) RO V in Legazpi City. The primary objective of this study was to create an online system that enables CHED RO V to monitor the quality of education delivered by specific Higher Education Institutions (HEIs). This monitoring is achieved by tracking the faculty lineup and qualifications, which are crucial factors in producing globally competitive graduates of high quality.

The project had several detailed objectives: Firstly, it aimed to determine the most effective method for HEIs in the region to submit their documents to the CHED office. This streamlining of document submission ensures efficiency and convenience for both the HEIs and CHED RO V. Secondly, the study focused on developing a web-based system that allows CHED RO V to monitor, track, and verify the manpower profiles, faculty lineups, and academic qualifications of registered tertiary schools in the region.

The final objective was to evaluate and validate the developed system in terms of functionality, reliability, usability, speed, maintainability, and portability. These aspects are crucial for ensuring that the system meets the required standards and can be effectively utilized by CHED RO V.

Based on the findings of the study, several conclusions can be drawn. Currently, the Commission on Higher Education utilizes spreadsheets as a tool for storing information related to HEI profiles, offered courses, and faculty lineups and qualifications. However, the development of an online tertiary schools manpower monitoring system best addresses the needs of CHED RO V in terms of collecting and monitoring HEI information, faculty lineups, and academic qualifications. Additionally, the system enables the tracking and monitoring of faculties teaching in overload or connected to multiple schools in the region.

The evaluation of the entire system by the CHED RO V ES and MIS head resulted in a satisfactory rating, while the HEIs and IT experts gave a very satisfactory

rating. This indicates that the developed Online Tertiary School Manpower Monitoring System effectively meets the needs and expectations of all stakeholders involved.

Considering the conclusions drawn, several recommendations can be made. The proposed Online Tertiary Schools Manpower Monitoring System should replace the current methods of collecting and monitoring HEI information, programs offered, faculty lineups, and academic qualifications. It offers improved efficiency and effectiveness in these areas. The system can also be utilized to track and monitor faculties who are teaching in overload or connected to multiple schools in the region, further enhancing its utility.

For future researchers working on similar projects, it is recommended to incorporate mobile technology support and compatibility to increase flexibility. Additionally, greater emphasis should be placed on system speed, usability, maintainability, and portability to enhance the overall performance and user experience of the system.

**Key Words:** Faculty Overload Monitoring System, Faculty Teaching Load System, Faculty Teaching Two or More Schools, Online Tertiary Schools Manpower Monitoring System, Subject Management System,

## INTRODUCTION

The Commission on Higher Education (CHED) was the governing body that covered both public and private Higher Education Institutions (HEIs) as well as degree-granting programs in tertiary institutions in the Philippines. As of 2011, the region had 154 registered tertiary schools, with 108 being private and 46 public schools [1]. However, CHED RO-V still relied on traditional methods to monitor the faculty profiles, line-ups, and academic qualifications of instructors in specific tertiary institutions in the Bicol region. This involved the authorized personnel or staff from each educational institution personally visiting the CHED Region V office to submit the faculty profiles, line-ups, and academic qualifications of their instructors.

CHED Region V, a public institution, had the mission to provide effective central office direction and implement programs and mechanisms to ensure affordable, quality higher education accessible to all in the Bicol region. Its vision was to be a key leader and effective partner in transforming HEIs to produce highly competent and productive professionals through dynamic, excellent, and client-oriented services. CHED's mandates included promoting quality education, ensuring accessibility to education for all, and safeguarding academic freedom for intellectual growth, learning, research, and the development of responsible and effective leadership, as well as the enrichment of historical and cultural heritage.

The existing system posed challenges for CHED RO V in terms of tracking updates to the manpower line-ups of every HEI in the region, as well as filtering and verifying faculty qualifications and academic performance.

To address these issues, the project proposal aimed to develop an easy-to-use and convenient online monitoring information system for CHED Region V. This system

would enable the monitoring of all tertiary school manpower line-ups, profiles, and academic qualifications in accordance with CMO No. 53 series of 2006, also known as the Program Assessment and Monitoring Report. The proposed project would serve as a tool for tertiary schools in the region, allowing them to store, retrieve, and update their faculty profiles and academic qualifications.

The objective of the study was to develop an online system for CHED Region V in Bicol to gather and monitor the manpower profiles, line-ups, and academic qualifications of tertiary schools in the region. This system would provide a fast, secure, cost-effective, and user-friendly information platform for storing, retrieving, and updating the manpower profiles and academic qualifications of the schools.

By leveraging advanced technology, the system aimed to provide all tertiary schools in the region with a centralized platform for storing, retrieving, and updating their manpower profiles, line-ups, and qualifications. For CHED Region V, this study aimed to enhance the quality of services provided and to serve as a monitoring tool for faculty qualifications, line-ups, and teaching loads in every tertiary school based on the submitted line-ups from trusted staff members at each school.

To ensure the accuracy and integrity of the faculty profiles, line-ups, and teaching loads, updates were required at the beginning of every semester by authorized and trusted staff members assigned by each school. Additionally, if necessary, CHED RO V would conduct ocular inspections to verify the information provided.

### **Specific Objectives**

Specifically, this study aims to:

1. Determine the method or manner of submission of documents to CHED office by the registered HEIs in the region.
2. Develop web based system that can be used by CHED RO-V in monitoring, tracking and verifying the manpower profile, line-up, and academic qualification of the registered tertiary schools in the region.
3. Validate the proposed system as:
  - a. Functionality
  - b. Reliability
  - c. Usability
  - d. Speed
  - e. Maintainability
  - f. Portability

### **Gap Bridged by the Study**

The study identified and addressed existing gaps in the field of monitoring systems for tertiary schools. Through a review of relevant literature and systems, it became evident that similar studies had been conducted and implemented. However,

there were still noticeable gaps that needed to be filled. The proposed online tertiary schools manpower monitoring system aimed to bridge these gaps.

The main objective of the system was to monitor the academic qualifications and performance of the faculty line-up in all HEIs within the Bicol region. By doing so, the system aimed to ensure that the region's HEIs would be highly competitive and capable of producing graduates who were highly qualified, competent, and globally competitive. This would help meet the current worldwide demand for skilled manpower.

The identified gap was the need for a comprehensive monitoring system that could effectively track and evaluate the qualifications and performance of faculty members in tertiary schools. The proposed online system aimed to bridge this gap by providing a centralized platform for monitoring and ensuring the quality and competitiveness of HEIs in the region.

By addressing this gap, the study aimed to contribute to the improvement of the overall educational landscape in the Bicol region. It recognized the importance of highly qualified and competent graduates in meeting the demands of the global job market. The proposed system would play a vital role in bridging the existing gap and facilitating the production of graduates who could meet the manpower needs of today's world.

Table I  
 Project Development Time Frame

ACTIVITY		TIME FRAME(In Months)											
		1	2	3	4	5	6	7	8	9	10	11	12
Study	Feasibility Study	■	■										
	Business Study			■	■								
Functional Model Iteration						■	■	■					
Design and Build Iteration									■	■	■		
Implementation												■	■

**Benefits of the Proposed System**

The primary purpose of this project was to ultimately produce highly competitive and quality graduates who would meet the current manpower demands. This objective was to be achieved through the implementation of the proposed system, which would provide HEIs with easy, cost-effective, and efficient access to store, update, and retrieve the manpower line-up and academic qualifications of their faculty members. The system aimed to alleviate the efforts, risks, time, and financial resources associated with traveling to submit faculty line-ups and qualifications, as well as verifying any potential duplications with other HEIs.

For CHED RO V, the proposed project was expected to extend their support to HEIs in the region, helping them streamline their efforts, reduce risks, save time, and optimize their financial resources in order to comply with the standards and requirements set by CHED RO V. In return, this would enable CHED RO V to monitor faculty academic qualifications and ensure compliance with HEI standards in a prompt and cost-effective manner. The system would serve as a valuable tool for CHED RO V, facilitating efficient monitoring and assessment processes while minimizing unnecessary administrative burdens for the HEIs in the region.

### **System Development Methodology**

The proposed system adopted the Dynamic System Development Methodology (DSDM) as its chosen approach. DSDM is an organized and common-sense process that prioritizes the swift and efficient delivery of business solutions, emphasizing collaboration and cooperation among all stakeholders. It places significant emphasis on the use of prototyping to ensure a clear understanding of all aspects of the system by all parties involved. The methodology comprised the following iterative stages and processes:

**Feasibility Study:** This stage involved assessing the feasibility of the proposed system, including the technical, economic, and operational aspects. It aimed to determine if the project was viable and could deliver the desired outcomes.

**Business Study:** In this stage, a detailed analysis of the business requirements and objectives was conducted. It involved identifying the key functionalities and features that the system needed to incorporate to address the identified needs.

**Functional Model Iteration:** This process involved developing and refining the functional model of the system through iterative cycles. It focused on prototyping and obtaining feedback from stakeholders to ensure that their requirements were met effectively.

**Design and Build Iteration:** This stage encompassed the design and development of the system based on the approved functional model. It involved creating the necessary software components, modules, and interfaces, adhering to the defined requirements.

**Implementation:** The implementation phase involved integrating the developed system into the existing infrastructure and environment. It encompassed data migration, system installation, and user training to ensure a smooth transition and adoption.

**Testing:** Comprehensive testing activities were carried out to verify the functionality, reliability, and performance of the system. This stage aimed to identify and rectify any defects or issues before the system's final deployment.

**Deployment:** Once the system had undergone thorough testing and validation, it was deployed for actual use by CHED RO V and the participating HEIs. This stage involved system rollout, user acceptance testing, and data migration, ensuring a seamless transition from the old system to the new one.

**Post-Project Review:** After the system's deployment, a post-project review was conducted to assess its performance, gather user feedback, and identify areas for improvement. This review aimed to ensure the system's effectiveness and refine it based on the actual user experiences.

## **Feasibility Study**

Feasibility study was conducted to determine the viability of developing an online tertiary school manpower monitoring system for Commission on Higher Education RO V. The Commission on Higher Education RO V served as the governing body overseeing both public and private HEIs, as well as degree-granting programs in tertiary institutions in the Bicol region, with a mission to promote quality education and provide effective central office direction.

The feasibility study was prompted by the problems highlighted by the respondents during preliminary interviews, as well as the data gathered by the researcher specifically for this purpose. The identified issues and concerns formed the basis for exploring the development of the online system to address the gaps and improve the monitoring of faculty manpower in tertiary schools.

By conducting the feasibility study, the researcher aimed to assess the technical, economic, and operational aspects of implementing the proposed system. This evaluation helped determine whether it was feasible and viable to proceed with the development of the online tertiary school manpower monitoring system.

The findings from the feasibility study would provide valuable insights into the potential benefits, risks, and challenges associated with the proposed system. This information would guide the decision-making process and inform the subsequent steps in developing an effective and efficient monitoring system for the Commission on Higher Education RO V.

## **Business Study**

During the business study phase, the requirements of the existing tertiary schools manpower monitoring system were determined through the formulation of a data flow diagram. Figure 1 illustrated the operational flow of the current system in submitting the Basic Higher Education Data Sheet (BHED), while Figure 2 depicted the process of faculty monitoring conducted by CHED RO V. In contrast, Figures 3 and 4 demonstrated the proposed process for the tertiary schools monitoring system.

Under the current system, the submitted files and documents were evaluated by authorized personnel at CHED RO V. However, if any file or document failed to comply satisfactorily with the requirements, the HEI user was unaware of the deficiency until they followed up with the CHED RO V office. In such cases, the HEI user had to return to their respective institution to update the deficient file or document. Once the update was completed, the HEI user would resubmit it to the CHED RO V office to ensure compliance with the requirements.

By examining the existing system's flow and identifying the challenges faced by the HEIs in submitting and updating documents, the business study aimed to uncover areas for improvement. The data flow diagram provided a visual representation of the current processes, enabling a thorough analysis of the inefficiencies and deficiencies. This analysis laid the foundation for designing a more streamlined and efficient process within the proposed online tertiary schools manpower monitoring system.

**Process 1.** Both Commission on Higher Education (CHED) RO V and Higher Educational Institutions (HEIs) will assigned an authorized user for the system. Each HEIs can have only one authorized user store in the system.

**Process 2.** In the proposed system the assigned authorized user of the school will request an account to be use in login in into the system then the CHED authorized user will verify the validity of the request made by the HEIs authorized person.

**Process 3.** After verifying and determining that the request made by the HEIs user is valid and it complies with the requirements prescribe by the CHED then the authorized person from CHED will create the account to be used by the authorized HEIs person. Then a confirmation will be sent by the CHED authorized person to HEIs authorized person informing that the account was already created.

**Process 4.** After the confirmation was received, the authorized person from HEIs can now login to the system to test if the user account sent by the CHED RO V user is a valid account.

**Process 5.** If the login was successful then the HEIs authorized person can now update the school profile, programs offerings, courses under selected program, faculty profile, faculty qualification and educational attainment, subject handled by the every faculty. The HEI faculty can also monitor the list of faculties teaching in two or more schools, faculty teaching loads and faculty teaching overload.

**Process 6.** In this process the HEIs user will perform or post the approve programs offered by the school including its curriculum. The posted programs will be validated and approved by the CHED RO V authorized user before it can be viewed by the guest users on the proposed system.

**Process 7.** This process enables the HEIs authorized user to post all the courses under a specific program offered by the school.

**Process 8.** This process enables the HEIs authorized user to post the faculty line-up of the school using the template provided by proposed system. Posting of faculty line-up is done every semester, this is to ensure that information posted in the system is an updated one.

**Process 9.** This process enables the HEIs authorized user to the post and update the educational attainment of the faculty line-up.

**Process 10.** This process enables the HEIs authorized user to post and update the trainings and seminars certificates that the faculty has attended.

**Process 11.** This process enables the HEIs authorized user to post and update the licenses that the faculty had passed.

**Process 12.** This enables the CHED authorized user to validate and check the veracity of the data posted by HEIs authorized user to ensure that the data to view by all guest users are true and reliable.

**Process 13.** This enables the CHED authorized user to post and update the CHED calendar of activities and memos.

**Process 14.** This process enables the system guest user to view all approve HEIs, programs offered and their curriculum, faculty teaching loads, faculty line-up and qualifications of the selected HEI and CHED Memos and activities.

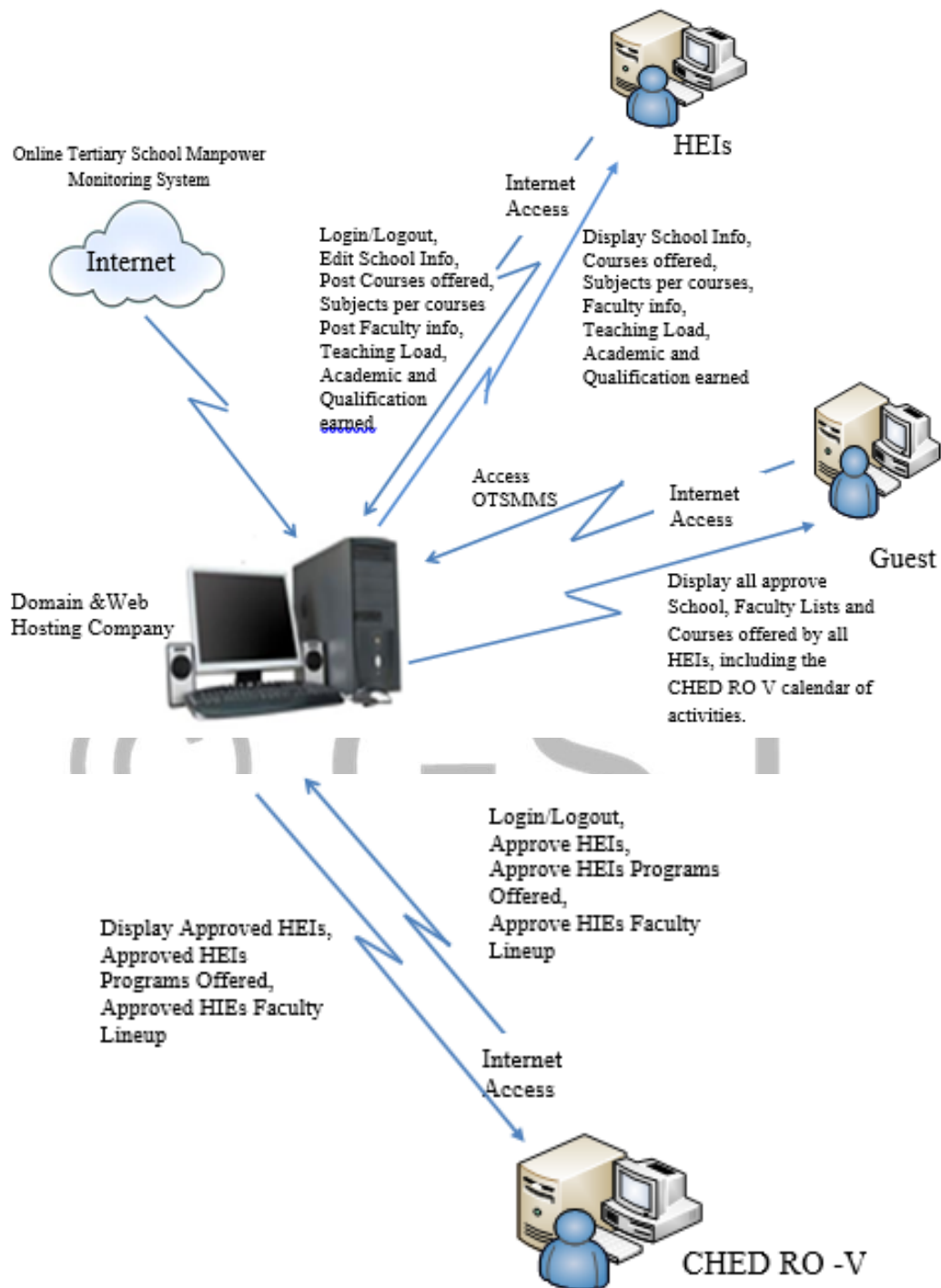


Figure 8. Proposed Functional Operational Flow of the proposed System

Figure 8 shows the functional operational flow of the proposed system. To ensure the security and secrecy of information that each HEIs will be submitting to CHED RO V office, the proposed online tertiary schools manpower monitoring system will be hosted by a domain and web hosting company here in the Philippines. In the proposed system, the



CHED RO V, HEIs and the guests are the three major groups of stakeholders that can access and will be benefited by the system. The CHED RO V assigned authorized user will register the HEI in the region after registering the HEI the CHED authorized user will create a temporary account that each HEI will be using. Once the account was created the CHED authorized user will notify and forward to the HEI account that their authorized user will be using to login into the system.

On the hand, once the HEI authorized user successfully logins into the system, this enables the user to update the school profile and post courses offered and curriculum, list of subject per course, faculty line-up, faculty educational attainment, faculty certificates and faculty licenses.

On the side of the Commission on Higher Education RO V, when the CHED authorized user successfully logins into the system, this enables the authorized user to monitor the HEIs courses and curriculum offered, faculty line-up and academic and qualification earned by the faculty.

Lastly, guest user of the system can view the approved HEIs, HEIs faculty lineup, and courses offered by HEIs in the region including the posted CHED activities and memos.

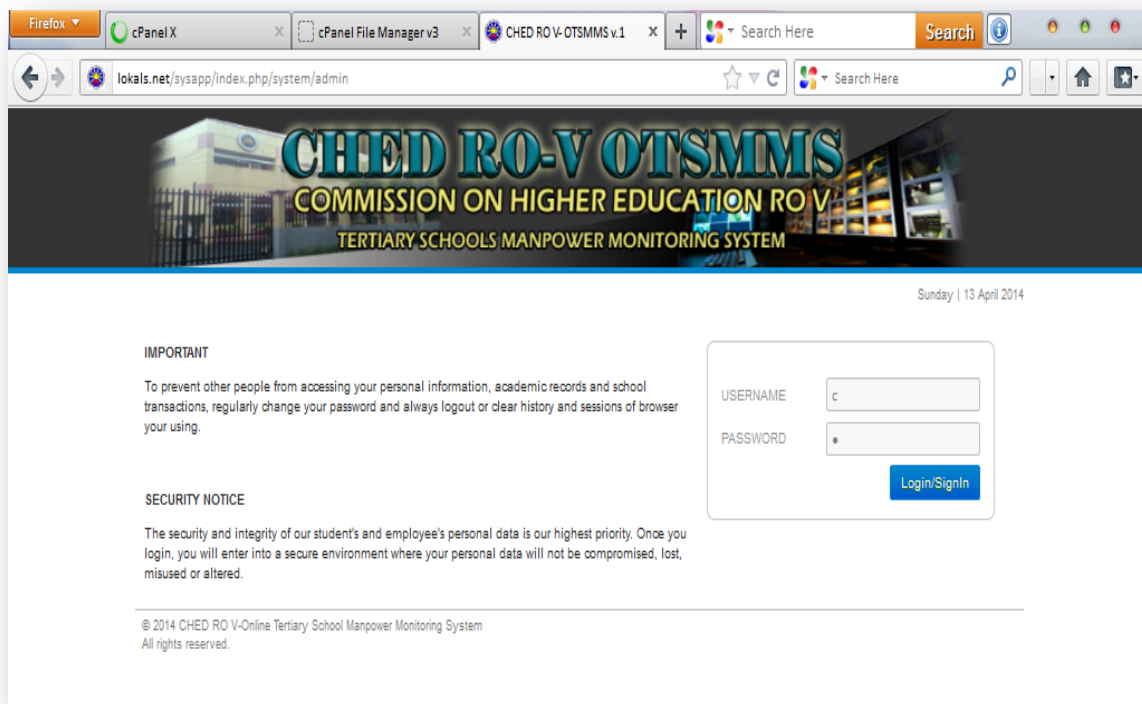


Figure 13. System Log-in Portal

Figure 13 shows the system portal login prototype design of the proposed system. This page serves as the window for the authorized and guest user to login and access the system. To login into the system the user must enter his/her assigned valid username and password then click LogIn/SignIn button to login into the system. Once the user has successfully login into the system, the system will display all the pages approved or assigned to the user as part of the user privileges.

## Findings

1. The method or manner of collecting the HEI Information, faculty line-up and academic and qualifications earned by the faculty are follows:
  - a. Thus, the Commission on Higher Education RO V uses CHED E-Form A to collect the Institutional Profile of all registered HEIs in the region.
  - b. CHED RO V uses CHED E-FORM B/C to collect the courses offered by all HEIs in the region
  - c. CHED RO V used Basic Higher Education Data (BHED) or CHED Form E-5 to collect the faculty line-up and teaching load assignment by all registered HEIs in the region
  - d. CHED E-Form A, CHED E-Form B/C, BHED or CHED E-5 Form as forms to be filled up by the registered HEIs in the region and was created in excel format.
  - e. Submission of the above forms is in softcopy format and need to be recorded in either CD/DVD.
2. The proposed system can:
  - a. Collect and monitor the HEI information and programs offered
  - b. Collect and monitor the faculty line-up, academic and qualifications earned by the faculty in every HEI
  - c. Track and monitor all faculties who are teaching in overload and teaching or connected in two or more schools her in the region
3. The System was validated by the CHED RO V Education Supervisors (ES) and MIS Head and Ten (10) IT Experts. The ES and MIS head rating for the system functionality is very satisfactory, its reliability very satisfactory, and its usability is also very satisfactory, and its speed and maintainability rating is satisfactory. However, the IT experts rating for the system functionality is very satisfactory, its reliability is very satisfactory, and its maintainability is also very satisfactory, while both usability, speed and portability has a rating of satisfactory.

## Conclusions

Based from the collected findings, hence, the following conclusions:

1. The commission on Higher Education uses spreadsheet as a tool to store the HEIs profile, Courses offered and faculty line-up, academic qualification earned by the faculty
2. The development of an online tertiary schools manpower monitoring system best respond to the needs of CHED RO V in:
  - a. Collecting and monitoring the HEI information and programs offered
  - b. Collecting and monitoring the faculty line-up, academic and qualifications earned by the faculty in every HEI
  - c. Tracking and monitoring all faculties who are teaching in overload and teaching or connected in two or more schools her in the region
3. The CHED RO V ES and MIS head evaluated the whole system with a rating of satisfactory while the ten (10) IT Experts evaluated the whole system with a rating of very satisfactory.

## Recommendations

Based from the collected conclusions, hence, the following recommendations:

1. The current manner or method in collecting and monitoring the HEIs information, programs offered, faculty line-up, academic and qualifications earned by the faculty can be replaced by the proposed Online Tertiary Schools Manpower Monitoring System for CHED RO V.
2. The proposed Online Tertiary Schools Manpower Monitoring System can be used by CHED RO V as a tool in:
  - a. Collecting and monitoring the HEI information and programs offered
  - b. Collecting and monitoring the faculty line-up, academic and qualifications earned by the faculty in every HEI
  - c. Tracking and monitoring all faculties who are teaching in overload and teaching or connected in two or more schools her in the region.
3. The researcher will focus and review more on the system speed, usability, maintainability and portability of the proposed system to attain a higher level of very satisfactory level.
4. For future researcher who aimed to update this study they may add mobile technology support and compatibility to add more flexibility on this project.

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