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Web-Based Strategic Performance Management System for State Universities and Colleges (SUCs)

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ABSTRACT

Strategic Performance Management System (SPMS) aims to facilitate improvement on how management determines the performance of employees. The system is designed to develop a centralized tool to create, supervise, and monitor the performance of employees and heads of offices who are both teaching and non-teaching staff through the completion of their Office Performance Commitment Review (OPCRs) and Individual Performance Commitment and Review (IPCRs). The system used the Rapid Application Development (RAD) methodology of developing the project. It is a development lifecycle designed to give faster development and higher-quality results than those achieved with the traditional lifecycle. The prototype development process consists of a series of design and builds steps in which the users have the opportunity to fine-tune the requirements and review the resulting software implementation. In addition to the tested software, construction stage deliverables include documentation and instructions necessary to operate the new application, routines, and procedures needed to put the system into operation. The web-based SPMS is user-friendly which means the suggested forms for organizational and individual commitments and performance are similar and easy to complete. The office, division, and

individual major final outputs and success indicators are aligned to cascade organizational goals to individual employees and harmonize organizational and staff performance ratings.

Keywords **—** Information Technology, Performance Monitoring, SPMS, RAD, Philippines

INTRODUCTION

What makes some business successful than others? In today's competitive and globalized world, only people can produce a modest sustainable advantage. Effective performance management must assist employees to discover their strong point, to recognize their indistinctness, and to develop their knowledge, skills, and attitudes regarding their expectations and capabilities.

The Camarines Norte State College (CNSC) is headed by a president and assisted by three (3) Vice Presidents; Vice President for Administration and Finance (VPAF), Vice President for Academic Affairs (VPAA), and Vice President for Research and Extension (VPRE). The Vice Presidents lead in the key functions of the College and are assisted by the college Deans and Campus Directors. The resident has the role in approving the Individual Performance Commitment and Review (IPCR) and Office Performance Commitment and Review (OPCR) of every employee in the campus.

On the other hand, the CNSC Planning Office along with the Performance Management Team composed of the different Vice Presidents and the Secretariat is the one that performs actual management and monitoring of the Strategic Performance Management System through facilitating the distribution and review of the OPCR or the Office Performance Commitment and Review Form to the Deans and Directors of CNSC. Moreover, the Chief Administrative Officer (CAO) is the one who cascade and review IPCR to non-teaching employees of the College. Meanwhile, the Dean and Campus Directors are given the role in cascading their IPCR to their subordinates for the review of the IPCR with corresponding commitment and evaluation. They oversee and assist in the review, monitoring, and supervision of the SPMS or Strategic Performance Monitoring System along with the different units/department concerned. After gathering relevant IPCRs and OPCRs, they will be returned to the Performance Management Team for review and evaluation. In the case of satellite campuses which are mostly located in far-flung areas some of which are

distributed in remote areas in Camarines Norte, they are also required to submit their Individual Performance Commitment Review and Office Performance Commitment Review on time just like the others and will be facilitated by the same Performance Management Team. Therefore, a strong collaboration and time are the key factors that substantiate the facilitation of this performance monitoring and evaluation. One of the key functions of the SPMS is that it becomes the basis for the Performance- Based Bonus (PBB) per Department and individual employee of CNSC.

OBJECTIVES OF THE STUDY

The system is designed to develop a centralized tool to create, supervise, and monitor the performance of employees and heads of offices who are both teaching and non-teaching staff through the completion of their OPCRs and IPCRs. The system is a web-based application that caters to centralized transmission and recall of information from the main campus to satellite campuses of Camarines Norte State College.

The system was designed to be a tool that promotes prompt submission of the IPCRs and OPCRs of the employees regardless of their work activities and their functions in school. Hence, the monitoring becomes easier as the system is equipped with a real-time monitoring capability making the planning director ensure that every employee is doing their functions on-time before their obligations.

FRAMEWORK

There are various learning materials and systems relative to the web-based strategic performance management system for SUCs that shed light on the present problem. Included in this chapter are sources that come from various references such as books, journals and electronic documents from the web. These resources gave the researcher insights and information that helped in the conceptualization of this study.

In recent years, strategic planning theory in schools has moved away from the traditional business model towards a strategic thinking approach. This is a strategy that is less a fixed design and more a flexible learning process that relies on school managers constantly listening and synthesizing what they hear and learn from all sources. The strategic plan arises from pragmatic, flexible strategic

thinking that relies on judgment as much as on spelling out action steps and the measurement of benchmarks.

The government introduces the Administrative Order No. 25, s. 2011 which is an inter-agency task force on harmonization of National Government performance monitoring, information and reporting systems. This serves as the basis for determining entitlement to performance-based allowances, incentives, or compensation of personnel. This was supported by Executive Order No. 80 directing the adoption of a Performance-Based Incentive System for Government Employees as President Benigno Aquino reiterated that starting 2012 bonuses of public employees are based on their conformity to the agencies target for the year as such the employee is rated based on his/her performances.

From the Operation Manual of the Camarines Norte State College, one of the SUCs in the Bicol Region, the planning unit is under the office of the President and performs the following mandates: a. Lead as far as the overall plan of the College is concerned; b. Assist the President in identifying the major thrusts of the College in formulating the College Development Plan; c. Gather and analyze basic background information with an emphasis on the socio-economic profile and existing programs and projects relative to instruction, research, extension and production functions of the College for the formulation of the College Development Plan; d. Coordinate with all Unit/Department Heads, Deans, and Directors on the formulation of programs and projects of the College; e. Make available to the President vital information/data and plan of action for policy formulation and decision making; f. Supervise the monitoring and evaluation of all infrastructure projects; g. Monitor and evaluate the implementation of the development plan; h. Coordinate with the Physical Plant the physical development planning of the institution; i. Assist the President in the management of special projects/linkages governed by MOA, and j. Perform such other functions that may be assigned to him/her by the President.

The study of Gotore (2011) focuses on evaluating the performance of a company through the performance management system implementation. This provides an idea on the cycle of Performance Management System related to visioning, planning, acting, monitoring, reviewing, adjusting and then re-planning. The study may help the researcher understand the performance management in an organization that can be useful if applied in the SPMS processes of the organization especially designed for the SUCs specifically in the Camarines Norte State College.

Another important study that may help the proponent in understanding properly the strategic performance monitoring was the study of Bulawa where

he determined the implementation of the performance management system in a school system in Botswana. The study finds that coordination, strategic plan, and proper cascading to the entire staff are necessary to get effective and accurate results for performance monitoring and management. The findings of this study will help the researcher understand the proper implementation of performance monitoring which is one of the core factors needed in this study.

The study of Bititci (1997) finds out that the performance management process, a closed loop control system, deploys policy and strategy, and receives feedback from different levels to govern the performance of the business. The performance measurement system is critically important to the effective and efficient functioning of the performance management system. It identifies two critical elements with respect to the content and structure of the performance measurement system. These are integrity and deployment. The viable systems model (VSM) provides a framework for assessing the integrity of the performance measurement system. The reference model developed for integrated performance measurement systems provides a framework against which performance measurement systems can be designed and audited.

The study of Heinrich (2002) focuses on the problems of performance-evaluation design and management of the system and its effectiveness as a policy tool for increasing governmental accountability. This analyzes experimental data and the performance management experiences of federal job-training programs to estimate the influence of public management and system design factors on programs outcomes and impacts. The study finds that the result of empirical analyses confirms that the use of administrative data in performance management produces inaccurate estimates of true program impacts. However, the study suggests that these data can still produce useful policy lever data for public managers that can be manipulated to improve organizational performance.

In terms of website-based programs, another influential study that may have significant bearing with the present study is the study of Siar (2005) where she attempted to determine the extent local government in the Philippines implemented e-governance using websites as their medium. Her findings indicate that there is a minimal adoption of e-governance and underutilization of websites as governance tools were provided by most of the Philippine government websites. Efficiency-enhancing contents and content promoting awareness for decision making were negligible. This study is an important basis for developing the proponent's system since the proposed system is a web tool application. Hence, the proponent should provide the necessary tools and functionalities that not only inform but also can help in the administration decision-making. Likewise,

usability testing for web-based applications was studied by Ssemugabi and De Villiers (2007), and the result of the study may help the proponent evaluate usability especially for web-based applications. The study is a heuristic evaluation of using one or more of various usability methods.

The study of Lee (2017) examines how the qualities of the implementation process control the effect of PHRM on intrinsic motivation and work effort. Analyzing the information from the 2014 Federal Employee Viewpoint Survey (FEVS), the study found out that the effect of motivation was greater for those who recognize performance appraisal as fair and are satisfied with post-assessment feedback. The results provide the workable leverages for enhancing employee motivation through the effect of PHRRM. In addition, the main effect of PHRM on work effort was found to be negatively significant while its effect on intrinsic motivation was positively significant.

The study of Bititci (2000) begins by creating a vision for dynamic performance measurement systems and describes the background to the work, develops a model for integrated and dynamic performance measurement systems, offers a critical review of existing frameworks, models and techniques against the model, identifies that current knowledge and techniques are sufficiently mature to create dynamic performance measurement systems. The utilization of the dynamic performance measurement system is illustrated through a case study which concludes with a series of lessons highlighting further research and development needs.

Meanwhile, a geographic information system-based decision support system called map analysis program (MAP) was developed by Pascual, Pasion, and Ragual (2004) to build wealth of geo-referenced data and information of higher education institution (HEIs) and programs for policy research development. Thematic maps as major outputs of the MAP showed various indicators that are useful for higher education research, planning, and policy options for rationalization and resource management of HEIs. The use of geographic information systems and database management systems are emerging information technology approaches and served as data banking tools to share statistical data, information, and knowledge among stakeholders on geographic areas and related policy issues. This study may help the proponent in establishing an idea on Decision Support System (DSS) developments that could link performance evaluators, planners, and policymakers towards developing new ideas.

METHODOLOGY

The system used the Rapid Application Development (RAD) methodology of developing the project. It is a development lifecycle designed to give rapid development and best results than those attained with the traditional lifecycle. It is designed to maximize development software. It follows an iterative process where activities are properly consolidated based on user design, prototype development, and the implementation stage.

The User Design stage consists of a detailed analysis of the system's activities. Key users, system functions, and define entity types associated with the system completed analysis by creating illustrations defining the interfaces between processes and data. System design and preliminary layouts of screens are developed.

The prototype development process consists of a series of design and builds steps in which the users have the opportunity to review the resulting software implementation. In addition to the tested software, construction stage deliverables include documentation and instructions necessary to operate the new application, routines, and procedures needed to put the system into operation.

The implementation stage involves implementing the new system and managing the change from the old system environment to the new one. This may include implementing bridges among existing and new systems, converting data, and training users. User acceptance is the end point of the implementation stage.

Also, it follows constant revision of the system based on the demand of the user as per user requirements. Therefore, a close work between the analyst and the user is expected. In this case, the researcher made sure that constant collaboration between the Planning Officer of the college and employee working on their IPCR and Office Performance Commitment Review is achieved to meet the desired result of the project.

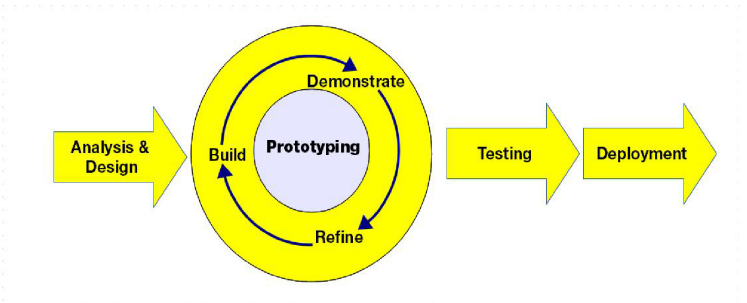

Figure 1. Rapid Application Development

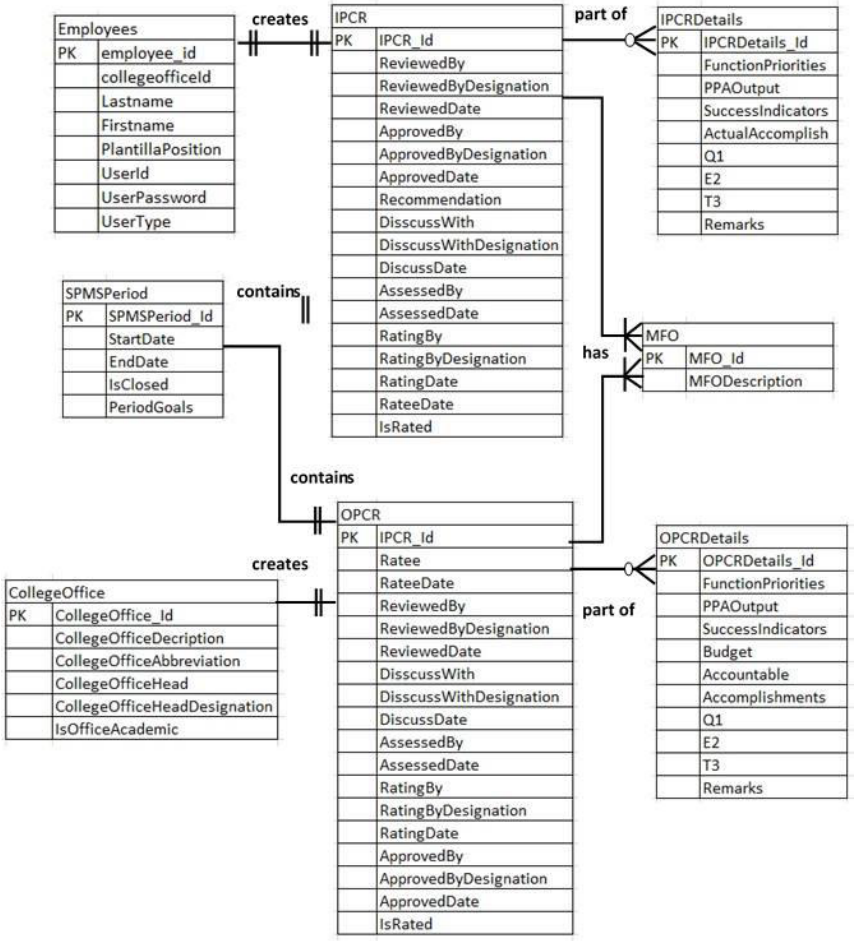

Figure 2. Entity Relationship Diagram

Architectural Design

Database Server

The database server hosts the information of the Web-based Strategic Performance Management System. For this purpose, MSSql Server was used as the database management system. This ensures additional security feature because of the separation from the actual application and direct access of the end-users.

Moreover, compatibility issues with PL Platform used are minimized since the latter is a Microsoft product with is running on Visual Studio.

Application Server

The application server is a web server running on Internet Information Server (IIS) and ASPX on a Windows Operating System. This is in direct connection to the Database Server. This also acts as a file server which hosts the contents uploaded by the employee and heads of school.

Internet Connectivity

This extends the Web-based Strategic Performance Management System for the SUCs to reach further and accommodate other devices such as personal computers and laptops within the school and also connect other satellite campuses once they logged in into the website.

Workstations executing Clients

The system is accessible thru the end-users via their workstations. These are their computers or laptops connected to the internet via network.

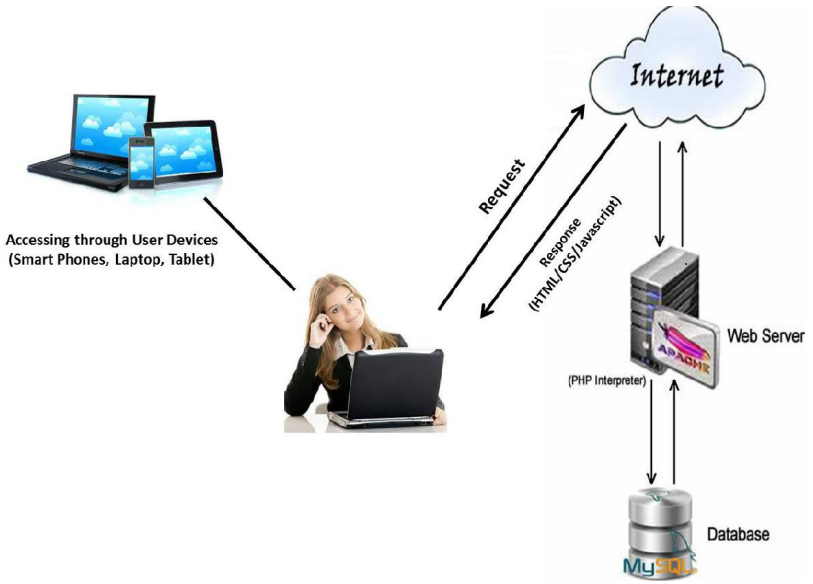

Figure 3. Architectural Design

RESULTS AND DISCUSSION

Software Evaluation

The evaluation of the software Web-based Strategic Performance Management System designed for SUC's is carried out as an important indicator for the actual users and possible users in its adaptation to actual academic management practice. The evaluation outlined their perception whether the demonstrated system possesses functionality, reliability, usability, efficiency, maintainability, and portability. Summary and discussion of this findings were shown as follows:

Functionality

The software was tested for functionality based on the five indicators such as suitability, accurateness, interoperability, compliance, and security. Given on the table are indicator descriptions showing that all of the respondents' responses Strongly Agree that the system possesses functionality. As shown, the highest among the weighted mean is 4.83 which is interpreted as Strongly Agree in response to suitability which means that the system has an appropriate set of functions in accordance with its system objectives. Thus, making it suitable to be used as a web-based performance management tool. Other indicators like accurateness have a weighted mean of 4.67, interoperability with a weighted mean of 4.75, compliance to address the needs 4.67 and security with a weighted mean of 4.58. All of these are interpreted as "Strongly Agree" thus, the system is functional.

Table 1. Perception of the Respondents on Functionality

Indicators	Weighted Mean	Interpretation
The software is suitable, but an appropriate set of functions in accordance with its system objectives	4.83	Strongly Agree
The software provides accurate results	4.67	Strongly Agree
It is interoperable with defined sets of computing environment	4.75	Strongly Agree
The software addresses the defined set of needs	4.67	Strongly Agree
It is capable of preventing unauthorized access whether accidental or deliberate to programs or data	4.58	Strongly Agree

Based on the table which shows the evaluation on the reliability of the system, it can be noted that the system possess fault tolerance which means it

has the ability to maintain a specified level of performance in case of software faults or of infringement of its specified interface with a weighted mean of 4.50 interpreted as "Agree" and recoverability which means it has the capability to re-establish its level of performance and recover the directly affected in case of a failure and on the time and effort needed for it with a weighted mean of 4.92 interpreted as "Strongly Agree". Based on the findings, the Web-based Strategic Performance Management system is reliable enough to be used in performance management for SUC's. However, there is still a need for the system to be tested for its fault tolerance which is why it is interpreted as "Agree" only not much like other indicators that were interpreted as "Strongly Agree". This can be done through a series of tests understanding system errors and possible solutions.

Table 2. Perception of the Respondents on Reliability

Indicators	Weighted Mean	Interpretation
It can maintain a specified level of performance in case of software faults or of infringement of its specified interface	4.50	Agree
It can re-establish its level of performance and recover the directly affected in case of a failure and on the time and effort needed for it	4.92	Strongly Agree

The usability as shown in the table suggests that the system can easily be understood, learned and operated. This means that the system is easy for the users to recognize its logical concept and applicability with a weighted mean of 4.67, easy for the user to learn its application with a weighted mean of 4.83, and the software is easy to operate with a weighted mean of 4.92. This suggests that the respondents strongly agree that the system is usable making it easier for them to implement and adapt to system technicalities without much effort on the training of new users.

Table 3. Perception of the Respondents on Usability

Indicators	Weighted Mean	Interpretation
It is easy for the users to recognize its logical concept and applicability	4.67	Strongly Agree
It is easy for the user to learn its application	4.83	Strongly Agree
The software is easy to operate	4.92	Strongly Agree

The perception of the respondents based on the summary result suggests that the respondents "Strongly Agree" that the system Web-based Strategic Performance Management system is efficient because it has acceptable response and processing time, and throughput rates (WM of 4.92). It also consistently uses enough computing resources (WM of 4.92). The time behavior and the resource behavior of the system make it more useful to process collaboration and to plan adept to the needs of the institution. Therefore, the need for a higher computing power is negligible and the implementation of the system is highly recommended.

Table 4. Perception of the Respondents on Efficiency

Indicators	Weighted Mean	Interpretation
It has acceptable response and processing time, and throughput rates	4.92	Strongly Agree
It consistently uses enough computing resources (memory space) for all of its functions	4.92	Strongly Agree

On maintainability, all the respondents' responses indicated "Strongly Agree" that it possesses characteristics of maintainability with high response to its analyzability, changeability, stability, and testability with each of the indicators assessed suggests remarkable values from 4.75, 4.83, to 4.92 respectively. Given this scenario, it could, in turn, lead to the reduction of system costs since maintaining a system can also be costly. Likewise, higher tolerance for defects and issues are mitigated due to the responsive nature of the system. Hence, the Web-based Strategic Performance Management system is maintainable.

Table 5. Perception of the Respondents on Maintainability

Indicators	Weighted Mean	Interpretation
It is easy to diagnose deficiencies causes	4.75	Strongly Agree
It is relatively easy to modify the software or remove faults	4.83	Strongly Agree
It is deemed stable when modified	4.92	Strongly Agree
It is easy to validate any modification made	4.92	Strongly Agree

In terms of portability, the researcher concludes that the respondents Strongly Agree that the system is adaptable, installable and conformable to the standards or conventions relating to portability with weighted mean values of 4.75, 4.92 and 4.83 respectively. The system also has a user manual that provides complete instructions on what to do and how to install the system contributing more to its portability.

Table 6. Perception of the Respondents on Portability

Indicators	Weighted Mean	Interpretation
It could adapt to different specified environments without applying other actions or means than those provided for this purpose for the software considered	4.75	Strongly Agree
It is easy to install the software in specified environment	4.92	Strongly Agree
It adheres to standards or conventions relating to portability	4.83	Strongly Agree

Figure 4. User Interface: Home

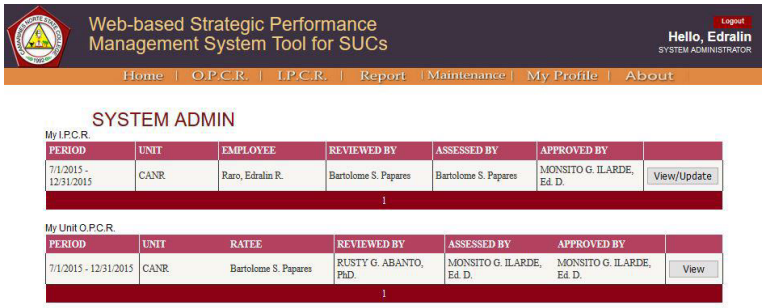

Figure 5. User Interface: System Administrator

Figure 6. System Administrator: OPCR view

Figure 7. System Administrator: IPCR view

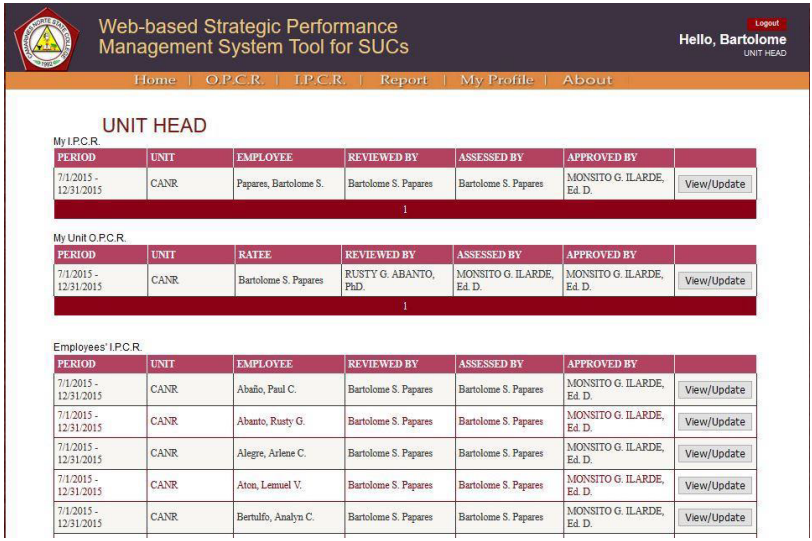

Figure 8. User Interface: Unit Head

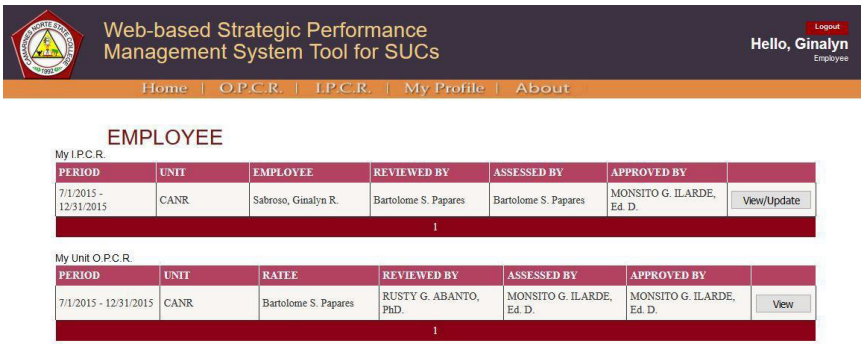

Figure 9. User Interface: Employee

CONCLUSIONS

The web-based SPMS is user-friendly which means the suggested forms for organizational and individual commitments and performance are similar and easy to complete. The office, division, and individual major final outputs and success indicators are aligned to cascade organizational goals to individual employees and harmonize organizational and staff performance ratings. The web-based SPMS supports monitoring and evaluation, and it has the information system that facilitates the linkage between organizational and employee performance and generates timely, accurate, and reliable information that can be used to track performance, report accomplishments, improve programs, and be the basis for policy decision-making.

TRANSLATIONAL RESEARCH

Given the heaviness of the above musings and reactions taken from the independent poll, the specialist additionally might want to bring up a portion of the issues for proposals given by the respondents. Their apparent issues were: 1) Deficient framework preparing; 2) absence of adequate number of PC and the requirement for assistance with the goal that the framework can address particular specialized issues of the clients. Taking these into contemplations, the specialist quickly discovers an approach to tackle this issue and to address the issue, for example, consideration of guidelines is necessary.

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