WEB-BASED PROJECT MANAGEMENT TOOL FOR COLLABUX WEB SOLUTIONS, CO

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Abstract. Companies have several duties and responsibilities to a foray of people such as employees, clients, and even inventors. But the mandate of most companies is to provide their clients with the best service they can provide. Collabux Web Solutions Co is a system development company in Legazpi City, Albay that has a wide variety of clients locally and internationally. During project reporting, the clients find it hard to stay in contact with the company because of the distance. Most reports are hard to be reported using other platforms.

For the foregoing reasons, the developer deemed it necessary to have a project management system that could cater to the growing needs of the company; thus, giving birth to the concept of the Web–Based Management Tool for the said company. The developed system's objectives were: to facilitate the assignment of projector tasks for designated clients with their respective project managers and teammates; centralize document storage for uploading and attaching files in different formats; registration of employees, projects, and clients information in a centralized database; notification for project managers, clients, team members for fast and efficient transactions; development of external and internal communication system that ensures the confidentiality and effective collaboration of all staff inside the company and view assigned status to track the progress and spent time for the project or task. The system was also evaluated using an industry-accepted quality standard –ISO 9126.

The general result of the evaluation by 38 respondents reflected that the developed system is highly applicable and very suits the need of the company with an overall rate of 4.538. The system is tested for its functionality, reliability, usability, efficiency, maintainability, and portability. Separate results showed that the system passed the entire variable against which it was fitted.

The developer is confident that along with the positive evaluation of the system, the company will use the system to its advantage to attract more customers and increase the level of performance of its employees and freelancers. The system also being deemed as maintainable can be adjusted to suit the company's future needs.

Key Words: *Business Systems, Private Business Websites, Project Management Tools, Web Solutions, Web-Based Systems*

INTRODUCTION

"*Project management is a discipline that often gets overlooked when attempting to move strategy from the boardroom to back offices and the marketplace.*"[1] (Longman, 2017)

Two people working together to achieve a common goal is defined as project management. In other words, project management is a methodology utilized on controlling the schedule, task, and cost of a certain project. In searching for a way to have an edge in today's chaotic and competitive global economy, different companies are turning to project management to deliver efficient and consistent business results. Project management, which is just starting right at the portfolio level, holds the strategic vision while driving the initial investment. Through a fully aligned portfolio, project, and program management strategy, it can incorporate an entire organization while dictating every execution undertaken or at each level within a project. Many companies today are now changing their ways of managing their employees from the traditional approach to these new efficient and timely employee methodologies.

Businesses, large and small, unquestionably juggle numerous projects, plans, tasks, and people. Having a solution that can help them keep organized while planning and running projects, in a way that is accurate, predictable, and profitable is promising. Having to deal with all of that, project managers can no longer rely on messy whiteboards, easy-to-lose sticky notes, and endlessly dull spreadsheets. In fact, 77% of companies in the USA use project management software and 87% of high-performing companies use project management software. (Karlson, 2017)

Tracking projects of the government in the Philippines can be a mix of different versions of spreadsheets, documents, email exchanges, and various meetings, which could lead to some confusion as to the actual state and progress of projects. In fact, the iGovPhil Program addresses this issue through the Government Project Management Information System (PMGov) - an online project management application that allows project proponents to collaborate with all the stakeholders every step of the way: from initiation to planning and design, execution, monitoring, and evaluation, to closing. (i.gov.ph, 2017)

Collabux Web Solutions, Co is mainly a system development company and IT solution in Legazpi City, managing a number of in-house employees and freelancers. Their clients are in Albay, Manila, and outside the Philippines like the United States and Australia offering quality services that can compete internationally, and are now ready to embrace the system being proposed to them.

Managing a project involves many different aspects and many things that have to be tracked and followed up upon. You have to determine project tasks, create a schedule, assign resources, and identify and track issues and risks. That's just the tip of the iceberg; as a project manager, you are responsible for the overall success of a project. (Hales, 2018)

The primary purpose of project management tools is to help managers plan, execute and control all aspects of the project management process. Companies rely on key tools for managing a project to ensure that each task is completed on time and to balance staff workload for optimal time management. Because project management tools enhance resource efficiency and ensure project scope, such tools are especially important for project managers involved with large, complex projects. Medium and large-sized companies, as without proper tools, an ingenious idea may turn into a mess. This can result in ruining relationships with clients and returning zero deliverables. (Renolds, 2018)

Collabux Web Solutions, Co knows and understands this dilemma and its importance. WBPMT or the Web-Based Project Management Tool is an effective answer to make their processes and transactions run smoothly with eagle-eye tracking in both employees and projects for each milestone they are into. It will automate and have a complete overview of all the projects in the pipeline to help coordinate resources and allocate budget. It is a user-friendly yet complete power system that assimilates all the transactions and processes such as employee's and client's information system, from assigning of tasks to each employee whether in-house employees or freelancers, estimation of activities, time and scheduling, resource allocation, quality management, risk management, communication and collaboration between the employees, clients and project managers and document sharing. The system helps the owners manage, analyze and report the progress of projects, while efficiently saving time than manual transactions and processes. Furthermore, the system is a web-based tool that enables clients from other countries to view and collaborate in the development of the project.

Running projects without good project management is a false economy. It's often thought to be an unnecessary burden on the budget, and there's no doubt it can be expensive – as much as 20% of the overall project budget. But can you afford to not have project management? Without it, what holds the project team and client together? And without it, who is left to navigate through the ups and downs, clashes, and catastrophes of projects? Inside a project management application, milestones, tasks, and even subtasks are assigned whether to a remote team member or in-house employees with a specific deadline. Great project management means much more than keeping project management's iron triangle in check, delivering on time, budget, and scope; it unites clients and teams, creates a vision for success, and gets everyone on the same page regarding what's needed to stay on track for success. When projects are managed properly, there's a positive impact that reverberates beyond the delivery of 'the stuff'. (Aston, 2018)

WBPMT is an easy-to-use web-based system that ensures each project is delivered on time and with the expected outcome. In addition, emphasis has been given to easy-to-use interfaces with a responsive design where project managers assign projects or tasks to each of their employees. The graphical user interface has detailed explanations and calm colors to make it more user-friendly. The users need not be techies, programmers, or database experts to benefit from this system.

Develop using web-based technology, the WBPMT can be accessed over the internet. With this, project managers and clients outside Albay or miles away from the Philippines are able to keep track of their projects and collaborate with ease.

Specific Objectives

Specifically, the study aimed:

1.   To design and develop a customized web-based project management tool that has:

   1.1.   A module for project tracking that facilitates the:

      1.1.1 Assignment of projects or tasks for designated clients with their respective project managers and teammates

      1.1.2 Centralization of document storage for uploading and attaching files in different formats (document, spreadsheet, PowerPoint, and PDF format)

      1.1.3 Registration of employees, projects, and client information in a centralized database

      1.1.4 Notification for project managers, clients, and team members for fast and efficient transactions.

      1.1.5 Development of external and internal communication system that ensures the secrecy and effective collaboration of all the staff inside the company

      1.1.6 View assigned projects status to track the progress and spent time on the project or task

   1.2   To evaluate/validate the developed system in terms of:

      2.1   Functionality

      2.2   Reliability

      2.3   Usability

      2.4   Efficiency/Speed

      2.5   Maintainability

      2.6.   Portability

Plan

In order to produce necessary data for the development of the system as accurately as possible, the developer devised an open-ended checklist questionnaire for three different respondents – The Co-Owners/Project Managers, the Clients, and the Employees which are categorized into in-house and freelancers.

The researcher carefully investigated, observed, and analyzed every detail that the current flow of the project and task dissemination to employees from in-house to freelancer staff. The gathered data were collated, tabulated, and analyzed to formulate the precise solution identified and encountered by the respondents.

After consideration and vigilant analysis of the data gathered, the researcher proposed the Web-Based Project Management Tool for CollabUX Web Solutions, Co., with the purpose of providing a convenient and reliable system for the project managers, clients, and employees.

Figure 4.1 showed the data flow diagram of the existing system. This is how the current system in the CollabUX Web Solutions, Co. works.
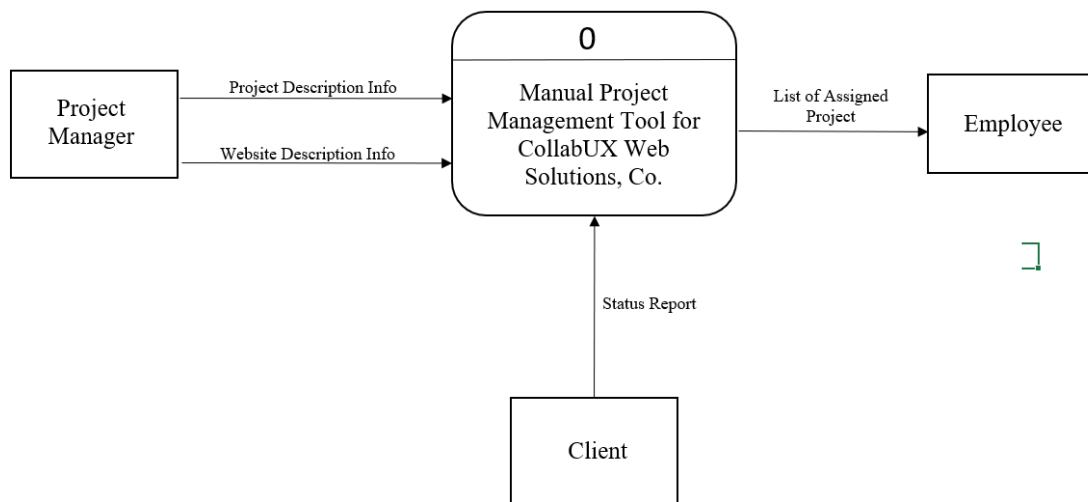

Figure 4.1. Data Flow Diagram of the Existing System

Requirements

The researcher talked with the CollabUX Web Solutions, Co., administration about the hardware and software materials needed *(see Table 3.1, Table 3.2, Table 3.3, and Table 3.4)* to make the development come into reality. From the development to the deployment, the proponent gave a list and explained the details including the time frame *(see Table 3.6).*

Design

The system and software design was ready from the requirements identified in the previous phase. The developer needs to think thoroughly about what the product or solution will look like that will suit the environment of the proponent.

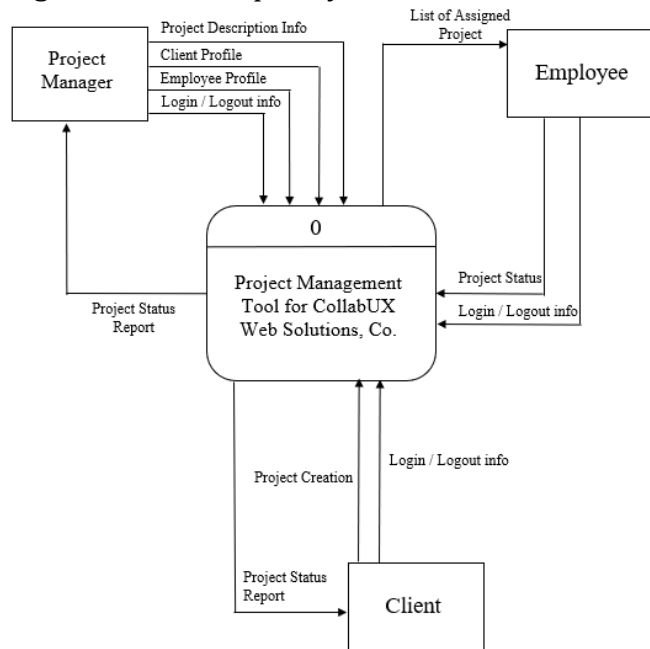The conceptual design of the Developed System is shown below.

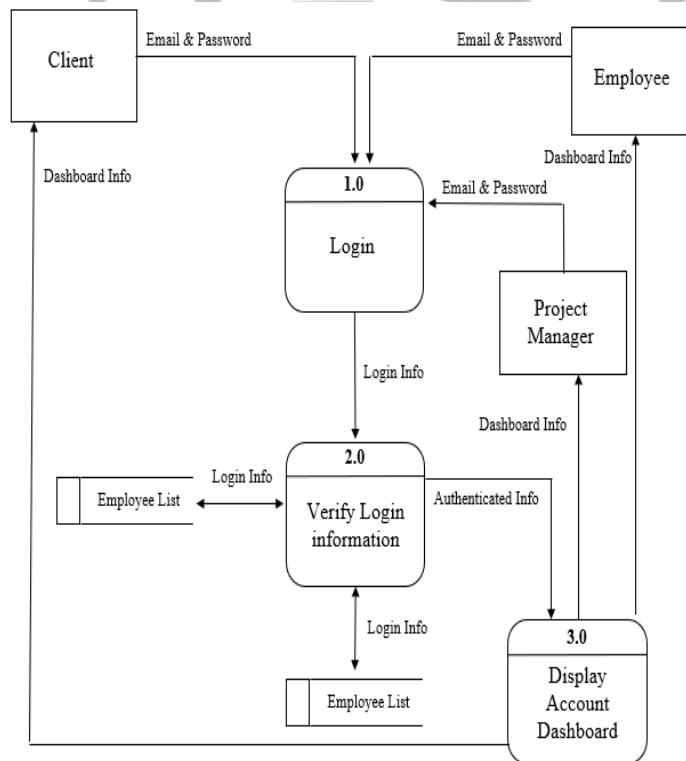*Figure 4.2. The Context Flow Diagram of the Developed System*
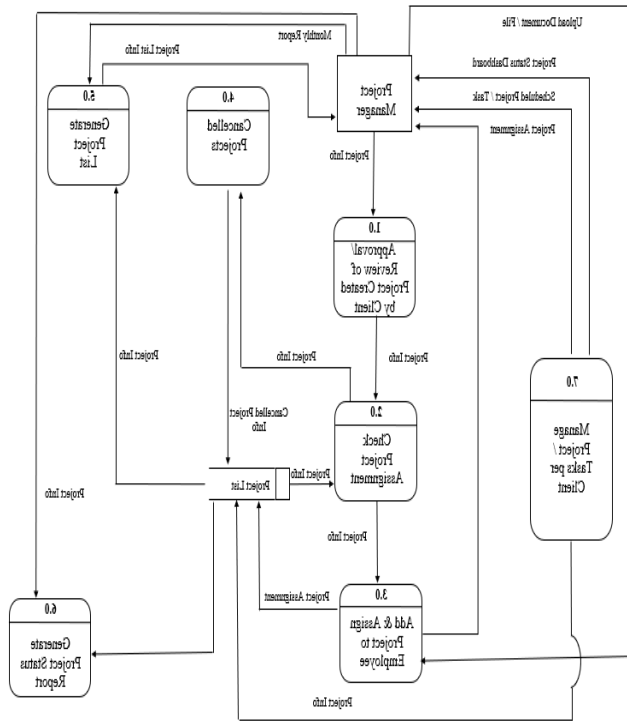

Figure 4.3. Data Flow Diagram of the Login Module

Figure 4.4. Data Flow Diagram of the Project Manager Module
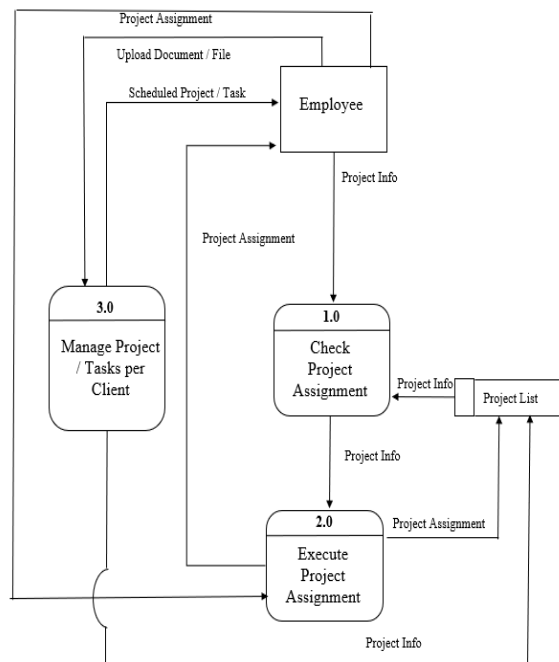

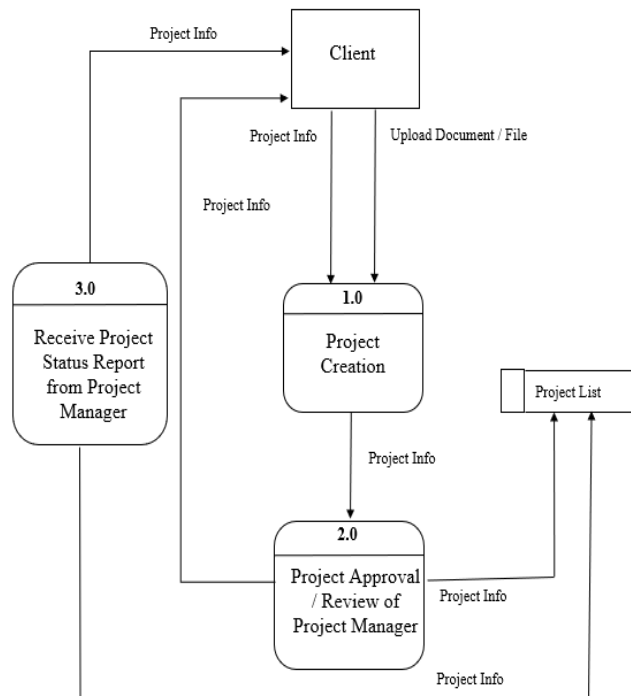*Figure 4.5. Data Flow Diagram of the Employee Module*

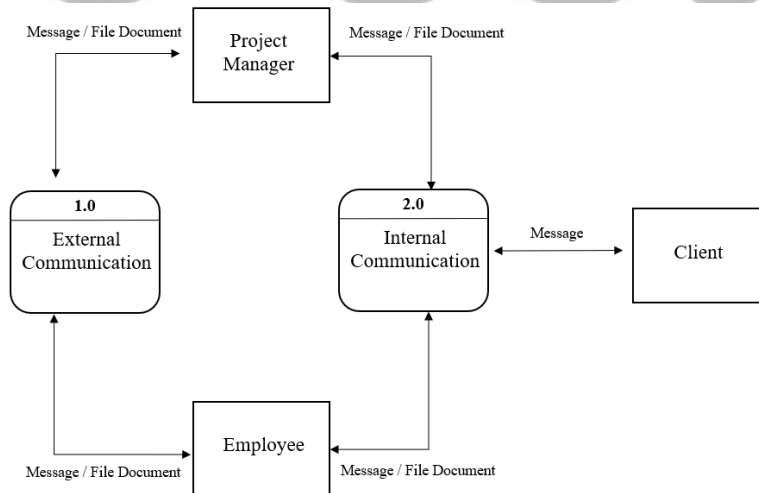*Figure 4.6. Data Flow Diagram of the Client Module*

Figure 4.7. Data Flow Diagram of the Chat System Module
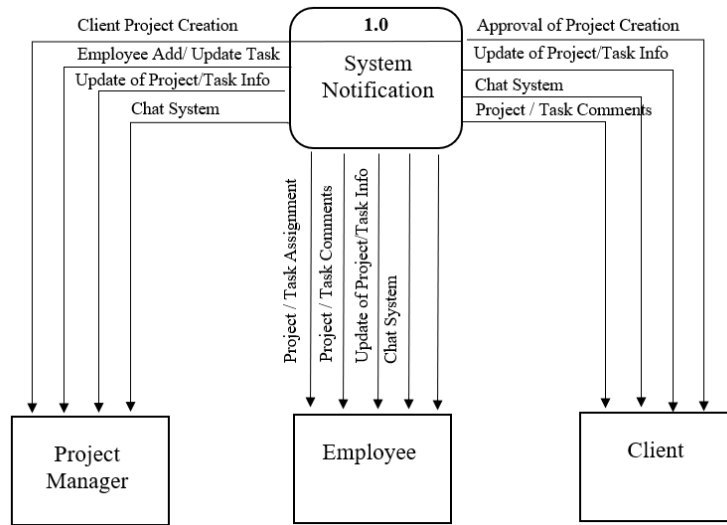
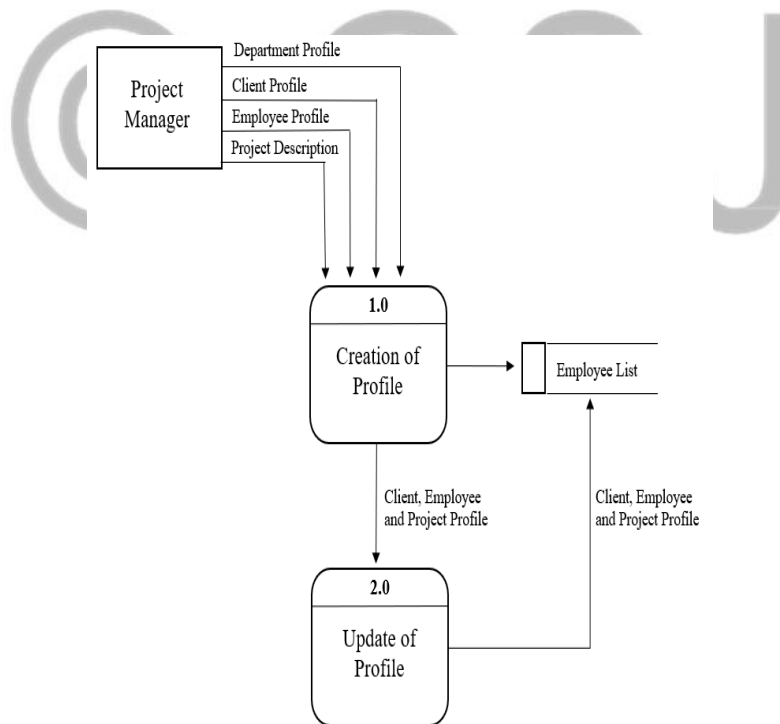*Figure 4.8. Data Flow Diagram of the Chat System Module*

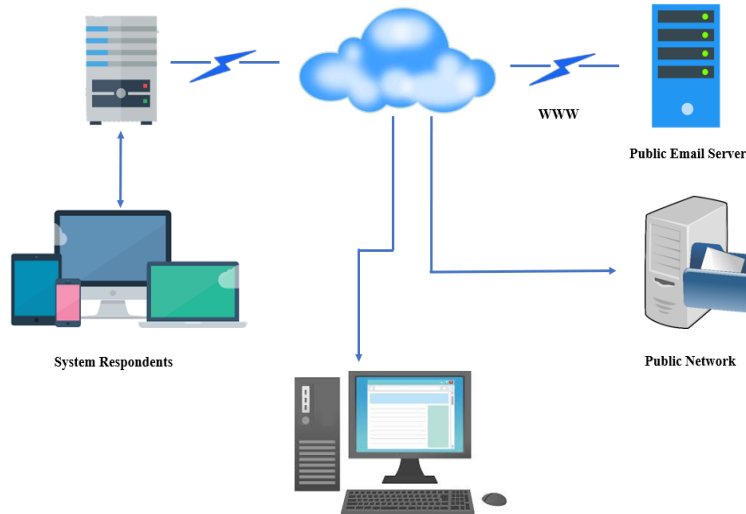*Figure 4.9. Data Flow Diagram of the Registration Profile Module*

Figure 4.10. System Architecture of the Developed System

Development

This phase is all about creating the Web-Based Project Management Tool for CollabUX Web Solutions, Co., with the Agile Methodology used by the developer of the proposed system. To that segment, the researcher added a well-defined, more people-centric viewpoint than traditional approaches, thus, the Agile process used feedback, rather than planning, as their primary control mechanism in software development.

The developed Web-Based Project Management Tool for CollabUX Web Solutions, Co., with its screenshots shown below:
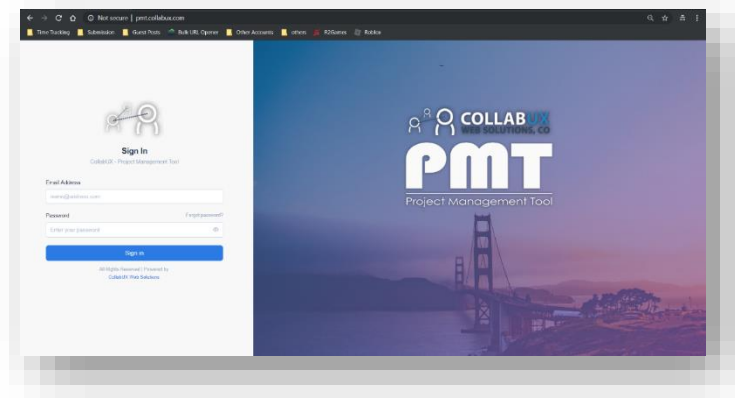

Figure 4.12. The WBPMTCWSC Project Manager Dashboard Module

Testing

Once the software tool has been developed, it was tested in contrast to the requirements to make sure that the system software was actually meeting the client's needs. During this stage, unit testing, integration testing, system testing, and lastly, acceptance testing were done.

The proponent used statistical tools to get organized information and had a general view of the whole scenario of the study. This included: Frequency, used for the researcher easily determine the most dominant variable/s in the data, such as the current methods used, problems encountered, and possible solutions. Another statistical tool used is Ranking in order to determine the order of top priority of the variables, the scaling system, and weighted mean which was used by the proponent as a technique to monitor the respondent's interpretation of facts.

The formula used to determine the weighted mean was:

$$\text{Weighted mean} = \frac{F_1(1) + F_2(2) + F_3(3) + F_4(4) + F5(5)}{F_1 + F_2 + F_3 + F_4 + F_5}$$

Where: F1 = Total number of respondents who answered Absence of the expectation

F2 = Total number of respondents who answered
Less than what is expected

F3 = Total number of respondents who answered
Presence of the expectation

F4 = Total number of respondents who answered
More than what is expected

F5 = Total number of respondents who answered
Far more than what is expected

The numerical rate:
(1) not applicable, (2) slightly applicable, (3) applicable (4) very applicable,
(5) highly applicable) = Overall Satisfaction.

An interval using a scale was used to show the description and interpretation of the average response in the system. The scale was utilized in order to describe the user satisfaction level of the system. The scales were as follows:

Table 4.1. The Scaling Systems

Interval Scale	Description	Interpretation
4.1 - 5.0	*Highly Applicable*	The system efficiently and effectively satisfied all quality model characteristics in terms of functionality, reliability, usability, speed, and maintainability
3.1 - 4.0	*Very Applicable*	The system efficiently and effectively satisfied some of the quality model characteristics in terms of functionality, reliability, usability, speed, and maintainability.
2.1 - 3.0	*Applicable*	The system minimally satisfied all quality model characteristics in terms of functionality, reliability, usability, speed, and maintainability.
1.1 - 2.0	*Slightly Applicable*	The system hardly satisfied the quality model characteristics in terms of functionality, reliability, usability, speed, and maintainability.
1.0 or less	*Not Applicable*	The system did not meet the quality model characteristics in terms of functionality, reliability, usability, speed, and maintainability.

During the testing, evaluations were done also. The system evaluation was anchored on ISO 9126. The areas that were evaluated in the developed system were functionality, reliability, usability, efficiency, maintainability, and portability. Thus, the results were presented in a series of tables below.

The four (4) sets of respondents provided insights on the overall quality of the system. These respondents were three (3) IT Experts, four (4) Project Managers, nineteen (19) in-house employees and freelancers, and twelve (12) clients. The respondents evaluated the system using the five-point scale system reflecting One (1) as the lowest and Five (5) as the highest.

Table 4.2. Table of Verbal Interpretation

Mean	Verbal Interpretation
0 – 1.0	Absence of the Expectation
1.1 - 2.0	Less than what is expected
2.1 – 3.0	Presence of the expectation
3.1 – 4.0	More than what is expected
4.1 – 5.0	Far more than what is expected

Table 4.3 depicted the results of the evaluation of the different respondents. With an overall mean of 4.583, the system is deemed "far more than what is expected," in terms of its functionality.

Table 4.9. Overall Evaluation of the Developed System

Quality Characteristics		Section Mean
1.0	Functionality	4.538
2.0	Reliability	4.520
3.0	Usability	4.456
4.0	Efficiency	4.463
5.0	Maintainability	4.395
6.0	Portability	4.598
	Overall Mean	**4.495**

Table 4.9 provides an overall evaluation of the system as reflected by the different respondents consulted by the researcher. The system from the perspective of the respondents turned out to be "Far more than what is expected" with an overall mean of 4.495. The system is considered to be "Highly Applicable" as perceived by the different respondents.

Deployment

After testing several times, the developed Web-Based Project Management Tool is installed to the clientele – the CollabUX Web Solutions, Co. But then, the developer will still track and monitor the software for a year to assure the go status of the developed system.

Findings

The following findings were obtained from the study:

1. The CollabUX Web Solutions, Co was using a combination of manual and computerized systems in terms of managing and assigning projects. Project Managers have this so-called "agenda book" that served as their manual notes about the status of the tasks/projects. Furthermore, using MS Excel is not that productive as it affects the concurrency of the said tasks/ projects.

2. The developed Web-Based Project Management Tool is a comprehensive software tool intended for use by project managers, clients, and employees which is now ready for deployment and usage by CollabUX Web Solutions, Co. upon completing the series of intensive testing and with the careful evaluation made in the project.

3. The newly developed system was evaluated in terms of functionality, reliability, usability, efficiency/speed, maintainability, and portability. Likewise, it was validated by four (4) sets of respondents to ensure the overall quality being set; (3) IT Experts, four (4) Project Managers, nineteen (19) in-house employees and freelancers, and twelve (12) clients of CollabUX Web Solutions, Co.

The thirty-eight (38) respondents consulted by this study gave a remark that the Web-Based Project Management Tool is "Highly Applicable" to the needs of the clientele. In other words, the system efficiently and effectively satisfied some of the quality model characteristics. In *Functionality* of the system, the overall mean is 4.538 which means that the system functions "Far more than what is expected". In the area of *Reliability* of the system, the overall mean is 4.520 which means the system is "Far more than what is expected"; in *Usability*, the overall mean is 4.456, meaning "Far more than what is expected"; in *Efficiency*, the overall mean is 4.463, meaning "Far more than what is expected"; in *Maintainability* and in *Portability,* the overall mean is 4.395 and 4.598 respectively, meaning both "Far more than what is expected." Consequently, the system is considered to be "Highly Applicable" as perceived by the different respondents.

Conclusions

Based on the findings of this study the following conclusions are formulated:

1. The developed system is considered to be "Highly Applicable" as perceived by the different respondents. The developed system is serviceable to CollabUX Web Solutions, Co. The Project Managers, Clients, and Employees were the primary beneficiaries. Most of the transactions that are supposed to be recorded and saved on computers through the use of Microsoft Excel, Microsoft Word, and agenda books can now be recorded and saved in the newly developed Web-Based Project Management Tool.

2. The developed Web-Based Project Management Tool with an overall mean of 4.495 is "Highly Applicable" to the needs of the clientele: the Project Managers, Clients, and Employees as perceived by the thirty-eight (38) respondents.

The developed Web-Based Project Management Tool passed ISO 9126 – (which is concerned primarily with the definition of quality characteristics to be used in the evaluation of software products). Therefore, serviceable to the needs of CollabUX Web Solutions, Co.

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