

The Development Of The Laguna State Polytechnic University – San Pablo City Campus’ Profile Management System

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Abstract

Employee selection process is the idea of picking the right person for the available position in the organization. This study is focused on developing a system capable of modernizing the process by creating a web-based application. Rapid Application Development was used to produce the final product which was divided into two modules. The pages designed are for application and management. Applicants will be able to complete a form and notify the institution of their submission. Administrators on the other hand are capable of analyzing, manipulating and browsing documents as well as notifying people of concerns. To determine if the developed system is optimal, the proponents conducted functionality testing and evaluation using an instrument inspired from the ISO 25010 software quality model as to Product Quality. The study procured a total mean of 4.30 which supports that the system’s objectives are accomplished.

Keywords: Employee Selection Process, management, institutions, profile management system.

INTRODUCTION

Employee selection, also known as candidate selection, is the process of finding a new hire best suited for the role in question. The steps in the employee selection process depend on the role you’re hiring for, your recruiting budget, the seniority of the position, available resources, and your organizational needs. Heather (2022) states that hundreds of documents are being submitted to the Human Resource Department whenever an opening is announced. The Laguna State Polytechnic University (LSPU) generally has two categories of application namely Academic and Administrative. The requirements needed for these positions depend on what the applicant is aiming for, however, one thing is certain and that is the need to submit a resume. The recruiting manager needs to have a careful investigation and analysis of the documents submitted to the office. Determining who is the best will depend solely on judgment. It is somewhat common

knowledge that the current hiring process begins when an applicant is noticed because of the document’s structure. Due to this process, not every applicant is given an equal chance to be considered. Moreover, LSPU has its preference on what should be seen on an applicant’s resume, therefore, the argument of what is the best format is not really necessary. In reality, skimming documents is not as interesting as it says and the person involved resolves to methods that can fasten the process which can be efficient but not effective.

Problems mentioned are mainly faced by the Human Resources (HR). The current practice requires the recruiter to handle the selection process manually from the submission up to the contact of a prospective employee. Additionally, comprehensive reading of each document is needed in order to know which applicant really has the best qualifications required for the fulfillment of the job. The effort and workload needed to accomplish this is heavy although unnecessary due to some phases that can be done

automatically via applications that can supplicate the need. Likewise, an applicant has to match the document preferred by the University and in most cases, this is not properly met, thus unnecessary information is presented to the recruiter. Since the traditional practice happens offline, documents can be misplaced during the process and the selection will only depend on the judgment of the recruiter without any variables to be considered, if any, it can be bypassed due to the volume of workload present.

A perceived solution to address the issues mentioned is to enhance the features of a digital repository fitted to the need of the department and will serve as the Laguna State Polytechnic University Profile Management System (LSPU-PMS). This system will try to reduce the workload needed in determining what document stands out among the rest which will then help related factors during the selection process.

Generally, the objective of this study is to develop a profile management system similar to the idea of digital repository for the Human Resources of the Laguna State Polytechnic University San Pablo City Campus. Specifically, this study aims to 1.) design and develop the Laguna State Polytechnic University Profile Management System that is capable of modernizing and enhancing the current hiring process. A system that can accept, manipulate and rank documents. In addition, this system can provide other features such as notifying an applicant about a possible meeting with the recruiter and analytics for the administrator. 2.) test the developed system as to its functionality 3.) evaluate the developed system using an evaluation tool that adopts the ISO 25010 software quality using the product quality composition.

I. RELATED LITERATURE

A. Faculty Profiling System

The development of profiling system of teachers and employees. It involves the process on the way of managing and record keeping of the teachers' confidential information. The main purpose of this study is to offer a detailed, reliable and secured keeping of the faculty/teacher records which includes their

personal record, list of trainings and seminars and other relevant information that will be included in their personal data sheet. The development of the profiling system hoped to improve the manner of managing and record keeping. This will be a big help not only to the teachers but also to the HR office who is responsible for collecting and archiving the said information and records (inettutor.com, 2021). Universities implement faculty profile systems to fill these and other needs. Profile systems make it easier for faculty to highlight and make accessible to their work (Givens & Mangiafico, 2017).

B. Profiling System

A profiling system refers to the process of application of a user's profile generated by the computerized application to manage the information. The results showed that the system can help the clients to improve the current process that they are using in the sorting of teachers' profiles, monitoring teacher evaluations, storage management of records, and making sure that the data are secured. In conclusion, the profiling system can help manage and improve the current process. The developed system can help the clients to evaluate their teachers easily and sort data (Barreda, Pelaez, Sambulan, Grecia, Estellore & Adovas, 2020).

C. Faculty Profile

Faculty profile pages are flexible, single pages for faculty information. Each faculty profile includes a certain amount of required information, e.g. job title and education, that is managed by the dean's office. In addition, faculty members and department administrators can add as much additional information as desired, such as publications, courses taught, research specialties, etc. The body of faculty profiles can contain text, tables, links, images, and video (www.oxy.edu, 2021).

Faculty profile pages allow you to showcase your research & academic accomplishments within the website personnel directory. Faculty members can log in and fill out their expanded Faculty Profile information and submit it, and Marketing and

Communications will create your profile and add it to the university website (www.sdsmt.edu, n,d).

D. Management System

Management systems are tools for managing complexity. It is about setting goals, considering the framework conditions, deriving actions and measures from the goals, and reliably completing tasks through clear processes and responsibilities (Meyer, 2022). Every organization will have a different level of complexity. It is to control these complexities and interrelated departments that the management system is necessary. Management systems can be simple or complex, depending on the organization. They can also be ad hoc or ongoing, or they can be uniform for everyone or different for everyone. Different management systems will result in different effectiveness standards. This is because what works for one will not work for everyone (Bhasin, 2021).

The management system should be subject to continuous improvement as the organization learns. In addition, it is a simple, effective and efficient system created to manage, which simply means it's just and fair (Mary, 2021).

II. METHODOLOGY AND PROJECT DESIGN

The study can be characterized as developmental research due to the fact that it involves a systematic study of designing, developing and evaluating the LSPU Profile Management System. Using this type of design to the study, the developmental process is described and the management system is evaluated. The participants will depend on what phase the development is currently on. The responsibility of designing and developing the system will fall under the researchers while Human Resources and applicants will simply serve as the client of this study. Figure 1 shows the IPO Model which ideally is the conceptual model of the study and serves as guide as the development occurs. Fundamentally, this model is divided into three main phases namely Input, Output and Process. To begin with, the model starts with the Input Phase wherein all the necessary requirements are gathered before the

development begins. Furthermore, this is divided into three requirement parts specifically Knowledge, Software and Hardware. Foremost is the Knowledge Requirement which includes familiarizing concepts and ideas needed during the Employee Selection Process. This includes submission and analysis of documents received. Following this component is the Software Requirement which includes all the technologies needed to achieve the developed system such as HTML, CSS, PHP, JavaScript and JQuery. Finally, the Hardware Requirement of a computer server will complete the Input Phase of this model. The process phase consists of various sub-phases undertaken and methods during the development of LSPU-PMS. RAD or Rapid Application Development was the Software Development Life Cycle (SDLC) used in this study. According to Chien (2021), RAD is a methodology that focuses on developing applications rapidly through frequent iterations and continuous feedback. The SDLC selected in this system development is composed of phases such as requirement, planning, user-design, testing and implementation. This type of methodology is commonly preferred due to its ability to produce a working system in a short amount of time. The first two consecutive phases are the stage where the proponents decide how the system will function as well as its interaction to the user. Additionally, the proponents prepared a Use Case Diagram which illustrates what roles can be given to the users of the system as well as their responsibilities. Afterwards, the system development will occur where the actual coding will be done in accordance to the subsequent design agreed by the proponents.

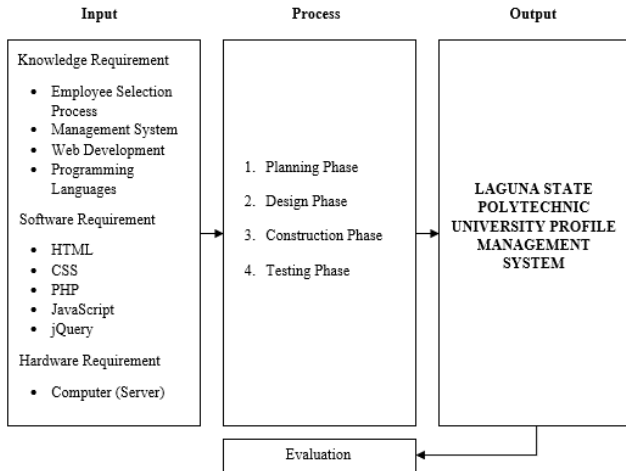


Fig 1. Conceptual Model

Functionality testing was conducted to test the systems performance in terms of functionality. During testing, the proponents created a list which is composed of test cases and test scenarios that determines the system's functionality in accordance with what it promised to offer. After the scenarios are finished, LSPU-PMS is expected to work optimally.

ISO 25010 is an internationally recognized tool as a measurement of evaluation to software products, this was also used by the proponents to verify if the system is conforming to standards. The proponents believed that it is best to use Random Sampling in selecting respondents. To determine the possible number of respondents, the proponents used the modified Cochran's formula. Using this method, the population of 50 was acceptable given that thirty (30) alone has a confidence level of 95% with a margin of error of 12.40%. The respondents this number will compose is from employees that are previously applicants of the institution and personnel from the Human Resource Department. Since all the respondents are at least a graduate of a certain course, respondents are already technical and knowledgeable when it comes to dealing with evaluation that has terms of functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability. Beforehand, the proponents made sure that the system is properly discussed and presented to the respondents. Afterwards, a reasonable amount of time was given to the respondents to browse and utilize the

system. Survey Questionnaire was the method used to gather data from the respondents. The survey was composed of questions inspired from the ISO 25010 software quality model which was common to similar publications. Members of the Human Resources Department answered the questionnaire. The structure of questions was designed to be similar to the Likert Scale where items are answered in a scale of 1 (very unsatisfied) to 5 (highly satisfied). Statistical data are treated using descriptive statistics. The Likert scale including the mean range and its verbal interpretation are shown in Table 1.

Table 1. Scale, Mean Range and Verbal Interpretation

Scale	Mean Range	Verbal Interpretation
1	1.00-1.80	Very Unsatisfied
2	1.81-2.60	Unsatisfied
3	2.61-3.40	Satisfied
4	3.41-4.20	Very Satisfied
5	4.21-5.00	Highly Satisfied

PROJECT DESIGN

Following the discussion with the Human Resources of the LSPU, the employee selection was the first inspiration on how the system will be utilized. The discussion below states the functionalities a specific user can perform in the system. Figure 2 illustrates the Use Case Diagram for this study.

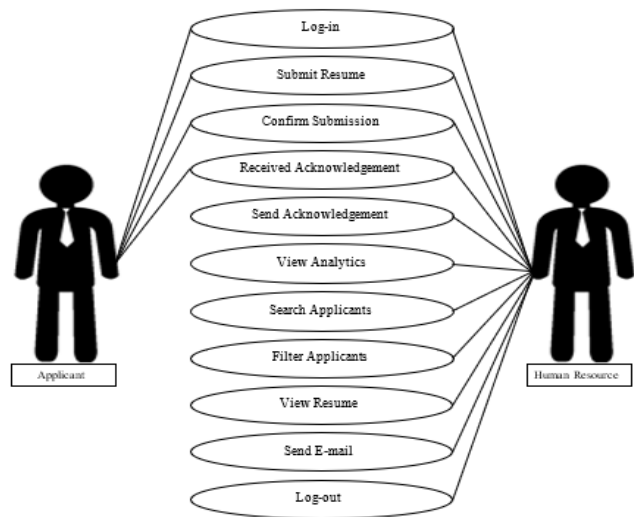


Fig 2. Use Case Diagram

Generally, the system is designed only for two users namely, the Applicant and the Human Resources. The applicant after confirming the intention of seeking application to the institution can proceed directly to the form where inputs are required for filling. All the fields necessary will alert the user if it is not yet accomplished. Once the applicant has finished completing the form, the user can now proceed for confirmation where a page similar to what the admin can see will display the inputs already entered. After verification the applicant will submit the form while logging out the system. A notification will then be sent to the admin stating that a new applicant has submitted a profile.

On the other hand, the Human Resources that will serve as administrator ideally has a separate page for logging in, once the correct credentials were entered, they will proceed to the analytics page wherein graphical reports based on the number of applicants according to application and sex are presented. Additionally, a notification bar will appear only if there is a newly submitted resume, if not the bar will not be displayed. Within the notification section a button beside the name of the recently acquired resume can be selected which will then send an acknowledgement email to the person involved. Furthermore, the admin can proceed to the search page where they can filter and search the applicants according to name, specialization and date of resume submission. Once an applicant is selected, the admin will be directed to the profile. While browsing, the admin has a choice to notify the selected applicant for an interview using the button provided at the attachment section. When clicked, a modal will appear displaying the selection of date and time. After the admin has decided the details and the confirmation occurred, the system will send a notification to the applicant notifying them of the interview the admin has sent.

IV. RESULTS AND DISCUSSION

A. DEVELOPED SYSTEM

The LSPU-PMS is a website developed to supplement the employee selection process of Laguna State Polytechnic University San Pablo City Campus. It is

derived from the manual operations done by the recruiter when a job opening is announced. The web application is composed of various pages including Index, Application Form and Confirmation Page for the Applicant and the Analytics, Search and Profile Preview for the Administrator. The pages designed for the applicants will serve as the official medium of recruitment wherein users can fill-out the form similar to what is done manually. After submission, the confirmation page is used as a way to verify all the information provided. Once all the details are correct the actual submission will occur at the back-end which then logs out the system. Furthermore, the pages designed for the administrator are dedicated for accepting, filtering, and managing documents as well as notifying applicants of concern. Access to the pages dedicated for the applicant and the administrator is separated due to confidentiality of the files submitted on the system.



Image 1. Applicant Index Page

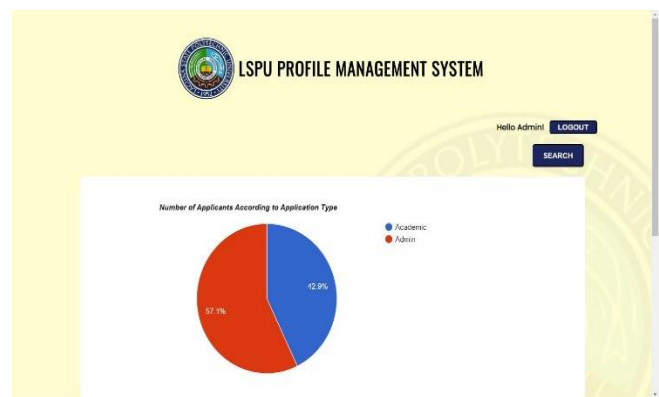


Image 2. Admin Analytics Page



Image 3. Applicant Index Page

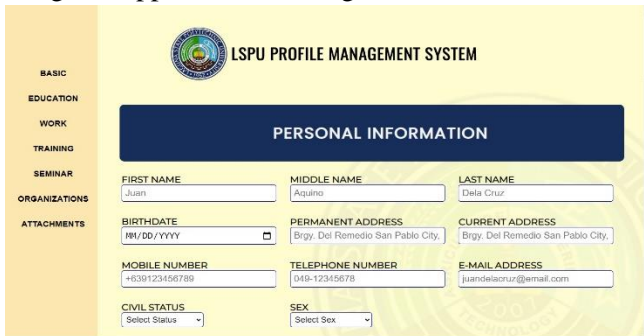


Image 4. Resume Input Page



Image 5. Resume Preview Page



Image 6. Admin Search Page

B. TESTING RESULT

A variety of testing processes was done to ensure that the system is functioning optimally and as promised. Initially, the functionality testing was conducted to make sure that all the possible actions are working properly. A list of test scenarios should occur in accordance to test cases is shown in Table II. In total there are 11 test scenarios with 25 corresponding test cases that will determine if the system is functioning as expected. Every test case is completed with the aim to verify that all the functions available on the system are working. Finally, the column entitled “Remarks” indicates the results done during the test which can only be passed or failed.

Table 2. Summary of Functionality Testing

Functionality / Test Scenarios	Number of Test Cases	Remarks
1. Log-in / Log-out	4	4 Passed, 0 Failed
2. Add Fields	4	4 Passed, 0 Failed
3. Upload Files	3	3 Passed, 0 Failed
4. Confirm Inputs	2	2 Passed, 0 Failed
5. Submit Resume	2	2 Passed, 0 Failed
6. Display Notification for Mailing Acknowledgement	2	2 Passed, 0 Failed
7. Send Acknowledgement	2	2 Passed, 0 Failed
8. Search by Filter	3	3 Passed, 0 Failed
9. Preview Selected Profile	2	2 Passed, 0 Failed
10. Notify Applicants for Interview	2	2 Passed, 0 Failed
11. Download Files	2	2 Passed, 0 Failed
12. Update Analytics	2	2 Passed, 0 Failed

Initially, the test begins by making sure the system is accessible. The page dedicated for the applicant is simply a button that will direct to the form while the admin is prompted with credentials. During this scenario, the page should be directed as the button was clicked by the applicant or the admin successfully entered the credentials needed. While the applicant is filling the form, a button that can display additional fields is available for sections that are sometimes in need of multiple inputs. In this scenario, after clicking the button the whole section should re-appear with no inputs as expected. Following the form is a division dedicated for attachments that the institution needs during application. On this test, users must be able to upload their files accordingly. After all the required

fields are entered with the necessary data, the user can now proceed to the confirmation wherein all the data provided is subject for verification before the actual submission. The system will pass this test only if all the data entered before is displayed properly. Once confirmed, users should be able to submit the resume prompting a notification to the administrator stating that a new application is made.

The next test scenario is the display of notification for mailing acknowledgement in the area of the administrator. The notification bar should display the recently acquired resume with a button beside coinciding with the action mentioned. The applicant must receive a mail stating that the HR now officially has the copy of the resume. Additionally, the administrator can search the list of applicants according to preference. The system should display the most relevant profile among the number of applicants even without clicking a button to initiate the search. After an applicant is selected, the appropriate profile should be displayed. Following this scenario is the test to notify the applicant for an interview. When the button is clicked, the modal should appear prompting the user to select the date and time. Once confirmed, an email should be sent again to the applicant stating the selected timeframe of the interview. Next, the administrator should be able to download the files uploaded by the applicant. Lastly, whenever a successful submission is done, the analytics page should be updated in accordance to the data presented. Each test scenario showed a positive response during the test and all the expected output was displayed accordingly. Using this result, the test conducted can be interpreted as complete.

C. EVALUATION RESULT

The developed system was evaluated using an instrument inspired from the ISO 25010 software quality model that was commonly used as a standard in terms of Product Quality composition. Responses from the participants were collected and computed and are summarized at Table IV. The columns presented are the criteria with their respective computed mean and verbal interpretation. Also, the table presented the overall

mean by computing the average of all the criterions combined.

Criteria	Mean	Verbal Interpretation
Functional Suitability	4.46	Highly Satisfied
Performance Efficiency	4.41	Highly Satisfied
Compatibility	4.10	Very Satisfied
Usability	4.45	Highly Satisfied
Reliability	4.20	Highly Satisfied
Security	4.14	Very Satisfied
Maintainability	4.30	Highly Satisfied
Portability	4.40	Highly Satisfied
Overall Mean	4.31	Highly Satisfied

Table 3. Result of Respondents' Ratings

In terms of Functional Suitability, the respondents left a rating of 4.46, interpreting that the respondents are highly satisfied. The main objective of the system which is to help computerize the employee selection process is present and functioning.

When it comes to Performance Efficiency the system scored a mean of 4.41 which means that the respondents are also highly satisfied. Given the main objective of the system, the process of eliminating manual document skimming is achieved and the time taken to recognize the right candidate for the job is lessened.

With regards to Compatibility the respondents marked the system with a mean of 4.10 which when interpreted means that the respondent is still very satisfied. Though scoring the least among the rest, most of the respondents still believe that it is usable. Given that the application is web-based, it is accessible to various devices that can display webpages. Moreover, the system exists outside the domain of the university web-based systems explaining the flaw of unavailability to communicate directly to the systems based on the institution.

A mean of 4.45 states that the respondents are highly satisfied with the system when it comes to Usability. The system's ability to search with various filters with ranking solved the need of manually selecting and browsing documents submitted to the department. Moreover, fields and upload buttons requiring the right format are already set to accept the

right input, thus, reducing the possible errors a user can create.

In terms of Reliability, a mean of 4.20 was given to the developed system denoting that the respondents are highly satisfied. A web-based application allows the user to control data whenever the possibility is present. Moreover, the ability to store information in the cloud protects the data from loss and tampering depending on the level of security. The respondents believe that the characteristics mentioned are present, thus, explaining the mark given.

The respondents rated the developed system with a mark of 4.14 when it comes to security. This result states that the respondents are very satisfied. The modules present at the application are designed to separate the functions available for the applicant administrator. Two different domains will communicate to store data entered by the user. First is what the applicants will use that will only display the input fields required for application. Second is the admin modules that will allow them to manage and study the acquired data. Separating the location of these two will decrease the possibility of data breach since access is not on a single domain.

4.30 is the mean given by the respondents when it comes to Maintainability, meaning the respondents are highly satisfied. The developed system is designed to separate what is used by the administrator and the applicant; thus, modification will not affect the system as a whole if a function is in need of improvement. The structure of programming methods used by the developers are scalable which means that the code itself is expecting further development in the future.

In terms of Portability, the system scored a mean of 4.40 stating that the respondents are highly satisfied. LSPU-PMS is an application based on the web, meaning access is almost everywhere given that devices have the capability to do so. Moreover, since it is built with languages common to web development, browsers will not have a problem interpreting the lines.

Given the results mentioned above, functional suitability is the best criterion passed by the developed system while compatibility inverses the latter. Overall, the system scored a total mean of 4.31 which is deemed

highly satisfied by the respondents of the evaluation that is based on criteria present at the ISO 25010 software quality model in terms of Product Quality composition. In conclusion, the system accomplished its desired purpose and the output expected is given assuring the quality of the system.

V. CONCLUSION AND RECOMMENDATIONS

The development of LSPU-PMS paved the way to webifying the current traditional method of employee selection process. The study successfully designed and developed a web application capable of supplanting the modernization of employee selection process at the Human Resources in the Laguna State Polytechnic University San Pablo City Campus. The system was visualized through the presentation of Use Case Diagram. LSPU-PMS is a system developed using the software development cycle of Rapid Application Development in addition to the utilization of programming technologies such as HTML, CSS, PHP, JavaScript and JQuery. The web application is composed of pages designed to separate the functionalities intended for the use of applicants and administrators. Applicants were able to complete a form and submit the data electronically which then notifies the admin of the submission. Likewise, the administrator has pages dedicated to analyze, manipulate, browse and inform data acquired from the applicants.

Fundamentally, a developmental study undergoes testing and evaluation. The developed system was able to pass the functionality testing and evaluation process. The functionality testing was done by conducting a total of 11 test scenarios with applicable test cases adding up to 25 steps. Fortunately, the system was able to withstand all the functionality testing done and the expected output was displayed accordingly. Additionally, the system was evaluated using an instrument inspired from the ISO 25010 in terms of quality composition. The result of evaluation marked the system as a product with High Satisfaction level especially in the area of Functional Suitability that scores the most among the rest of the criteria.

A different result of evaluation could have been met if the number as well as category of participants were expanded. During the study, the proponents only considered asking participation of the local Human Resources as well as employees that were formerly applicants of the institution. Findings may differ if all the Human Resources among the various campuses were considered as well as testing the system to actual prospective applicants of the University. Furthermore, the evaluation was technical, therefore, respondents must first have the prior knowledge in understanding the process. A low complex method of evaluation may vary the result obtained from this study. Follow-up research is recommended to further improve the system's usability, interoperability and navigability.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

R.A dela Cruz spearheaded the development of the system, conducted the evaluation, and wrote the paper; M.J. N. Del Rosario conducted the research, designed the system, conducted testing and wrote the paper; J. E. de Torres conducted the testing and wrote the paper and all authors had approved the final version.

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