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University's Scholars Portal: A Recommender System

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Abstract: ***The main objective of the study was to develop and implement a University's Scholarship Information System for the University of Antique, Tario-Lim Memorial Campus, Tibiao, Antique. Furthermore, this study focused on a University's Scholars Portal integrating a Recommender System of who among the students ae qualified in availing such scholarship grants offered by the government and other private institutions. It was developed and tested by 30 evaluators using ISO 25010 characteristics which include functional suitability, reliability, portability, usability, performance efficiency, compatibility, and maintainability. The results of the study revealed that in all of the ISO 25010 characteristics the participants strongly agreed to the developed system. Weighted mean, Standard Deviation and Likert scale with verbal interpretation were used to analyze and evaluate the system. It is then concluded that the system is very helpful and of great help to the University.***

Keywords: Scholar, Recommender system, ISO 25010, Portal, system evaluators, developmental research

1. Introduction

Every Academic Year, majority of students apply for many scholarships from the government and other private institutions. At the same time, there are a large number of qualified students who do not apply for the same scholarships due to the lack of consciousness and / or the application process of the scholarship being inaccessible (PA Alvaro, 2021).

Scholarships are a means to empower deserving students to have an education that might otherwise be beyond their reach, to reassure them to study well and is a great way to motivate them to perform even better.

Most of the universities and government have multiple scholarships across various segments. They can be scholarships for academic excellence or in various sports. There are scholarships for vocational courses as well as for performing arts. Each of these scholarships work in making the students feel empowered and financially stable.

Scholarship is a serious tool to simplify education for qualified students, especially those who are socially and economically challenged in the state, and bring them on to the mainstream development track. Processing these applications is always time-consuming and prone to errors due to their current paper-based system of processing (Mohammed Abdullahi Jibrin et al, 2016).

Supporting education through scholarships to students of higher learning is an important aspect of government's effort to support students at all levels of learning to allow them afford the rudimentary needs that accumulate during their studies. It's a government plan to develop a serious mass of professionals who would serve as catalysts of change and agents of scientific and technological advancement, as well as sustainable economic growth. However, the cost of education has risen extremely over the past few years hindering the families of low income earners to send their children to school as they can barely afford the cost. Scholarship as defined as a grant or payment made to support a student's education, awarded on the basis of academic or other achievement. Many scholarships are bestowed based on merit. However, some also take into account financial need. Scholarships do not have to be refunded. Currently, the procedures of applying for scholarships, managing scholarship and evaluating application forms are all done manually using paper-based processing. Applicants have to fill out their application forms and succumb them manually to the office. If there is any problem with their applications while they are processed, it will also take an extra time for both the reviewing committee as well as the applicant to communicate and correct the errors. Therefore, additional paperwork for the review may cause a delay in the entire procedure. The processes of screening the applicant's credentials, evaluation of applicant's form, conducting aptitude test and oral interview are also tedious. This informed the development of an online web-based system (e-scholarship system) which can facilitate the processes of various scholarship applications.

Research Objectives

General Objective:
To develop a Scholarship Management System for the Office of the Student Affairs Services (SAS) Unit of the University of Antique Tario-Lim Memorial Campus, Tibiao, Antique

Specific Objectives:
Specifically, this study sought to:
1) Provide needed personal details or information of the scholars of the institution;
2) Generate needed reports regarding scholars as to degree programs and type of scholarship enjoyed by students;
3) Test the quality of the developed system based on ISO 25010 standards.

2. Methodology

This chapter presents the method of research used, the sources of data, and the data gathering procedure, the data gathering instrument, and the statistical treatment of data.

Research Design
The researcher adopted the developmental type of research to achieve the purpose of the study. This method is a fact-finding study that encompasses sufficient and precise interpretation of data and their findings. This approach is appropriate wherever the object of a class varies among themselves and one is interested in knowing the extent to which different conditions obtain among objects. The data from a descriptive survey was used as basis for influence that may aid in solving practical complications.

Participants of the Study
This study was conducted at University of Antique, Tibiao, Antique Philippines and this required 30 respondents.

Data Gathering Instruments and Techniques
The major instrument that was used in gathering the data was the evaluation form. This was the main instrument to be used in soliciting responses from the subject of this study.

Preparation of Instruments
Data gathering is the most important part in conducting the study. The researcher prepared the form on the instruments especially on the students PII include: personal information, family background and educational background to be filled up by the participants or the students to be able to come up with the idea and data needed in the study.

Data Gathering Procedure
In gathering the data, the researcher asked personally of the grants application form and evaluated questions to the user of the system. First, the researcher make a request letter to the CCS department asking permission to conduct interview of the study. Second, was the interview of the researcher to the user of the system. Lastly, was the retrieval of the data needed to make the system so that the researcher could get started a running system. Through this procedure, the researcher was able to get one hundred percent retrieval of the instrument.

Statistical Tools
The data that will be gathered will be analyzed and summarized by the researchers, with the use of weighted mean and Likert scale.

Weighted Mean
The weighted mean for each item will be obtained by multiplying the scale value of responses by the total number of responses indicating the total weighted points and dividing them by the total number of responses. The mean is the measure of central tendency.

$$\bar{x} = \frac{\Sigma f \bar{x}}{n}$$

Where:
$\bar{x}$ = Weighted Mean
F = Frequency
x = Scores
N = Total number of participants
Σ = Summation

Table 1: Likert Scale

Interpretation	Value	Range
Poor	1	1.00 – 1.80
Fair	2	1.81-2.60
Satisfactory	3	2.61-3.40
Very Satisfactory	4	3.41-4.20
Excellent	5	4.21-5.00

Table 1 shows the Likert Scale and its weighted mean. The weighted mean is categorized in weighted points. The verbal interpretation for the 5-point scale is shown in the table.

Software Model
This section gives a description of the methods used in developing the proposed system. The Development Model was developed using the Rapid Application Developmental (RAD) model.

The researchers used this model because the system requirement is very well documented, fixed, and clear.

The figure below shows the process of Rapid Application Development; (1) Requirements Planning, (2) User Design, (3) Construction, and (4) Cutover

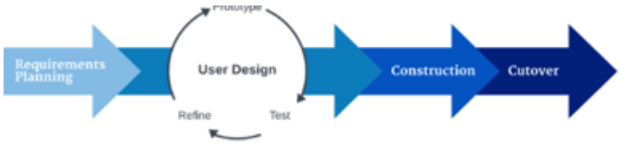

Figure 5: RAD *(Rapid Application Development)* Model

Rapid Application Development (RAD) is a team-based technique for acceleration the development of information systems and producing a working system. Like Joint Application Development (JAD), RAD takes a collective approach but takes it a step further. While JAD's final outcome is a requirement model. RAD's final product is a new information system. RAD is a full approach with four phases that correspond to the Systems Development Life Cycle (SDLC) phases. Companies utilize RAD to minimize development costs and time while increasing the likelihood of success.

Four Phases of RAD Model

Requirements Planning
During this stage, developers, users and team members communicate to determine the goals and expectations for the project as well as current and potential issues that would need to be addressed during the development of the system.

User Design
During this phase, users work hand in hand with developers to ensure their needs are met at every step in the design process. It is almost like customizable hardware or software development where the users can test the system at each stage to ensure that their expectations were met.

This method gives the developers the opportunity to tweak the model as they go until they reach a satisfactory design and eventually approve a working model of the system that can meet their needs.

Construction

The hardware or software development team of programmers, and testers work together during this stage to make sure that everything is working smoothly and that the end result satisfies the user's expectations and objectives. In RAD, however, users continue to participate and still can suggest changes or improvements as actual screens or reports are developed.

Cutover

The finished product goes to launch. It includes data conversion, testing, and change over to the new system, as well as user's training. All final changes are made while the coders and users continue to look for improvement in the system. Compared with traditional methods, the entire process is compressed. As a result, the new system is built in a precise manner, delivered, and placed in a much sooner operation.

3. Results and Discussion

Table 2: Mean distribution of Functional Suitability of the System

Indicators	Mean	SD	Interpretation
Completeness	4.83	0.38	Strongly Agree
Correctness	4.83	0.38	Strongly Agree
Appropriateness	4.73	0.44	Strongly Agree

Reflected in table 2 are the mean scores and standard deviation of the Functional Suitability of the system. Results showed that Completeness and Correctness has the highest mean score of 4.83 and with the standard deviation of 0.38 then Appropriateness has the lowest mean score of 4.73 and the standard deviation of 0.44. This shows that the participants strongly agreed that its functions are appropriate and correct.

Table 3: Mean distribution of Reliability of the System

Indicators	Mean	SD	Interpretation
Maturity	4.56	0.57	Strongly Agree
Availability	4.73	0.44	Strongly Agree
Fault Tolerance	4.77	0.43	Strongly Agree
Recoverability	4.67	0.48	Strongly Agree

Table 3 presents the mean and Standard Deviation of the Reliability of the System. Results showed that Fault Tolerance has the highest mean score of 4.77 and with standard deviation of 0.43 then Maturity has the lowest mean score of 4.56 and standard deviation of 0.57. This shows that our participants strongly agreed that the system is reliable and facilitates the accomplishment of specified tasks and objectives in every module or panel.

Table 4: Mean distribution of Portability of the System

Indicators	Mean	SD	Interpretation
Adaptability	4.73	0.44	Strongly Agree
Durability	4.73	0.44	Strongly Agree
Installability	4.87	0.40	Strongly Agree
Replaceability	4.73	0.44	Strongly Agree
Affordability	4.77	0.43	Strongly Agree

The data in Table 4 show the mean and Standard Deviation distribution of Portability of the System. Results showed that Installability has the highest mean score of 4.87 and with standard deviation of 0.40 then Adaptability, Durability, and Replaceability have the lowest mean score of 4.73 and standard deviation of 0.44. This shows that the evaluators strongly agreed that the system is adaptive, affordable, replaceable, easy to install for different hardware, or other operational specified environment.

Table 5: Mean distribution of Usability of the System.

Indicators	Mean	SD	Interpretation
Appropriateness Recognizability	4.73	0.44	Strongly Agree
Learnability	4.77	0.43	Strongly Agree
Operability	4.87	0.40	Strongly Agree
User Error Protection	4.73	0.44	Strongly Agree
User Interface Aesthetics	4.60	0.67	Strongly Agree
Accessibility	4.87	0.40	Strongly Agree

Table 5 shows the mean and Standard Deviation distribution of the Usability of the system. Results showed that Operability and Accessibility have the highest mean score of 4.87 and with standard deviation of 0.40 then User Interface Aesthetics has the lowest mean score of 4.60 and standard deviation of 0.67. This shows that our participants strongly agreed since the system user easily recognize this system for his/her needs and it allows users with wide range of characteristics and capabilities to achieve goals in a specified context of use.

Table 6: Mean distribution of Performance Efficiency of the System

Indicators	Mean	SD	Interpretation
Time-Behavior	4.73	0.44	Strongly Agree
Resource Utilization	4.67	0.48	Strongly Agree
Capacity	4.77	0.43	Strongly Agree

The data in Table 6 above show the mean score and Standard Deviation of Performance Efficiency of the system. Results showed that Capacity has the highest mean score of 4.77 and with standard deviation of 0.43 while Resource Utilization has the lowest mean score of 4.67 with standard deviation of 0.48. This connotes that the system is performing efficiently as proven by the computed standard deviation.

Table 7: Mean distribution of Compatibility of the System

Indicators	Mean	SD	Interpretation
Co-Existence	4.77	0.43	Strongly Agree
Interoperability	4.7	0.60	Strongly Agree

Reflected in Table 7 are the mean scores and Standard Deviation of Compatibility of the system. Results showed that Co-Existences has the highest mean score of 4.77 and with standard deviation of 0.43 while Interoperability has the lowest mean score of 4.7 and standard deviation of 0.60. This shows that our participants strongly agreed that the system meets the requirements and provides the system with better response, processing, when performing each function.

Table 8: Mean distribution of Maintainability of the System.

Indicators	Mean	SD	Interpretation
Modularity	4.77	0.43	Strongly Agree
Reusability	4.80	0.54	Strongly Agree
Analyzability	4.80	0.54	Strongly Agree
Modifiability	4.77	0.43	Strongly Agree
Testability	4.73	0.44	Strongly Agree

Shown in Table 8 are the mean scores and Standard Deviation of the maintainability of the system. Results showed that Reusability and Analysability have the highest mean score of 4.80 and with standard deviation of 0.54 while Testability has the lowest mean score of 4.73 with standard deviation of 0.44. It was found out that the evaluators strongly agreed that the system maintainable as proven by the computed standard deviation.

4. Summary

The study was conducted in order to support the operations of the Student Affairs Services Unit of the University of Antique, Tario-Lim Memorial Campus, Tibiao, Antique. Interviews were conducted in order to gather sufficient data that could really help improve the study. Search for enough literatures and related studies was done so as to substantiate the study. Rapid Application Development (RAD) tool was utilized for this is really fitted in the development of the study. Moreover, descriptive statistics was utilized in order to analyze and interpret the results of the study where Likert scale was also used as basis in the said interpretation. Furthermore, appropriate programming languages were also considered for the furtherance of the developed system. Lastly, there were 30 respondents who evaluated the system based on ISO 25010 standards.

5. Findings

The system, Scholarship Management System of the Office of the Student Affairs and Services (SAS) of the University of Antique, Tario-Lim Memorial Campus, Tibiao, Antique was developed in order to help ease the processes in the mentioned office. The study was further made, so as to streamline processes as far as entering, classifying, updating scholars of the University. Moreover, the study was conducted in order to support the said office in the submission of the list of scholars to the concerned agencies, specifically the Commission on Higher Education and the Provincial Government of the Province of Antique. Furthermore, the development of the system has really improved the operations of the above-mentioned office especially in looking for personal details or information of the scholars and could detect scholarship grants enjoyed by the students.

6. Conclusions

Based on the above-mentioned findings, the researchers concluded that the developed system has really helped ease the operations of the Office of the Student Affairs Services of the University of Antique Tario-Lim Memorial Campus, Tibiao, Antique. The expectations of the users were met with regards to the characteristics of the software such functional suitability, reliability, affordability, feasibility, performance efficiency, security, compatibility, and maintainability.

7. Recommendations

Considering the above findings and conclusions**,** the developers offered the following:

The office of the Student Affairs Services (SAS) Unit of the University of Antique, Tario-Lim Memorial Campus, Tibiao, Antique must use this system for it will really help ease the office operation as far as managing the records of the scholars is concerned.

A training should be conducted so that the user will not find difficulties in using the system.

Future researchers may utilize the results of the study for the improvement of such similar research undertaking.

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