

Parents Teachers Association (PTA) Collection Management System

Ramil G. Lumauag

Abstract: This study aims to develop a Collection Management System for ISAT U Miagao Campus Parents Teachers Association (PTA) which automates the manual process of collection of payment, and to solve the problems in the inconsistency and inaccuracy of financial reports made every semester. The system was developed using the prototyping model, and a usability metrics were used to evaluate the system's effective, efficiency, and the level of satisfaction among the clientele. The result shows that the system is 100% effective and efficient which implies that it can successfully complete its task in a shorter period of time. The clientele were very satisfied on the services of the system. Suggestions to improve the process and make it as a multi-user were given.

Keywords: Collection Management, Financial Management, System Development

I. INTRODUCTION

The Parents Teachers Association (PTA) of Iloilo Science and Technology University (ISAT U) Miagao Campus aims to support the University in promoting student's welfare, it helps the University through infrastructure projects and student's scholarship. Every enrolment period, a PTA fee is collected and remitted to the treasurer for budgeting and recording. Since the payment is collected manually, the treasurer find it hard to manage the collection, as well as preparation of the financial report which results to inconsistency of financial report, and it takes time to prepare the report of collections made every semester. These problems motivates the researchers to develop an automated system to speed up the collection process as well as generates an accurate financial report.

A. General Objectives

To develop a Collection Management System for ISAT U Miagao Campus Parents Teachers Association (PTA)

B. Specific Objectives

- To create an application that will record student's payment in the database;
- To generate a daily and summarized financial report;
- To keep track of students who has not paid the PTA Fee;
- To manage financial report in a timely, accurate, and efficient manner;
- To evaluate the system's effectiveness using the ISO/IEC 9126-4 Usability Metrics; and
- To evaluate the user's satisfaction on the use of the system.

Revised Manuscript Received on 20 February 2018.

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II. CONCEPTUAL FRAMEWORK



Figure 1. Conceptual Framework of the Study.

Figure 1 shows the Conceptual Framework of the Study which illustrates the input, process, and output.

III. METHODOLOGY

A. System's Development

The Evolutionary Prototyping Model by Pressman [2] was used in the development of the system. Prototyping is most useful in development of systems having high level of user interactions such as online systems. Systems which need users to fill out forms or go through various screens before data is processed can use prototyping very effectively to give the exact look and feel even before the actual software is developed. Figure 2 shows the Evolutionary Prototyping Model.

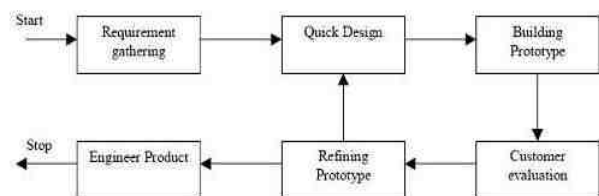


Figure 2. Evolutionary Prototyping Model.

B. Requirement Gathering

This step involves understanding the very basics product requirements especially in terms of user interface. In this phase, data from the tourism office will be collected and identified, and the profiling of data will be established.

C. Quick Design

This step involves designing the user interface, graphical design, as well as building the initial requirements of the system.

D. Building Prototype

This step involves building the model, in this phase the actual process is defined, its functionality and interfaces. In this phase, the test data will be supplied to test if the algorithm works and if it displays the correct result.

E. Customer Evaluation

In this step, the prototype developed is then presented to the customer and the other important stakeholders in the project for testing. A test case will be developed to gather feedbacks. The result of the evaluation will be used for further enhancements in the development of the system.

F. Refine Prototype

In this stage, the feedback and suggestions will be discussed, the changes accepted are again incorporated in the new Prototype developed and the cycle repeats until customer expectations are met.

G. Engineer Product

In this step, the finished product will be implemented and deployed.

H. System’s Evaluation

In evaluating the system, the ISO/IEC 9126-4 Usability Metrics was used. Usability is defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” [1]. The ISO/IEC 9126-4 Metrics recommends that usability metrics should include:

Effectiveness: The accuracy and completeness with which users achieve specified goals

Efficiency: The resources expended in relation to the accuracy and completeness with which users achieve goals.

Satisfaction: The comfort and acceptability of use.

I. Usability Metrics for Effectiveness

Effectiveness can be calculated by measuring the completion rate. Referred to as the fundamental usability metric, the completion rate is calculated by assigning a binary value of ‘1’ if the test participant manages to complete a task and ‘0’ if he/she does not.

Effectiveness is represented as a percentage by using this equation:

$$Effectiveness = \frac{\text{Number of tasks completed successfully}}{\text{Total number of tasks undertaken}} \times 100\%$$

J. Usability Metrics for Efficiency

Efficiency is measured in terms of task time. that is, the time (in seconds and/or minutes) the participant takes to successfully complete a task. The time taken to complete a task can then be calculated by simply subtracting the start time from the end time.

The overall relative efficiency was used in evaluating the system’s efficiency. It uses the ratio of the time users who successfully completed the task in re total time taken by all users. The equation is re follows:

$$Overall\ Relative\ Efficiency = \frac{\sum_{j=1}^R \sum_{i=1}^N n_{ij} t_{ij}}{\sum_{j=1}^R \sum_{i=1}^N t_{ij}} \times 100\%$$

Where:

N = The total number of tasks (goals)

R = The number of users

n_{ij} = The result of task i by user j; if the user successfully completes the task, then $N_{ij} = 1$, if not, then $N_{ij} = 0$
 t_{ij} = The time spent by user j to complete task i. If the task is not successfully completed, then time is measured till the moment the user quits the task

K. Level of Satisfaction

To test the level of satisfaction among the clientele of the system, a researcher-made questionnaire was used to gather the responses. 30 respondents were randomly selected to evaluate the system.

To interpret the scores, the five point Likert scale was used.

Range	Descriptive Rating
4.21 – 5.00	Very Satisfied
3.41 – 4.20	Satisfied
2.61 – 3.40	Moderately Satisfied
1.81 – 2.60	Dissatisfied
1.0 – 1.80	Very Dissatisfied

Mean was used to determine the level of effectiveness of the system. It is computed by adding up all the values in the series and dividing them by their count.

IV. RESULTS AND DISCUSSION

A. System’s Effectiveness

In evaluating the system’s effectiveness, the system was tested during the enrolment period for the First Semester and Second Semester of Academic Year 2016-2017.

Total number of tasks completed successfully: 3,120 transactions. Total number of tasks undertaken: 3,120 task

$$Effectiveness = \frac{3,120}{3,120} \times 100\%$$

$$1 \times 100\% = 100\%$$

Based on the actual test, the system’s effectiveness is 100% since it successfully completed all the tasks.

System’s Efficiency

The following data shows the result of the evaluation of the system’s efficiency.

N = The total number of tasks = 1

R = The number of users = 2

User 1: $N_{ij} = 1$ and $T_{ij} = 5$ mins

User 2: $N_{ij} = 1$ and $T_{ij} = 7$ mins

$$Overall\ Relative\ Efficiency = \left(\frac{(1 \times 5) + (1 \times 7)}{(5 + 7)} \right) \times 100\%$$

$$\left(\frac{(5) + (7)}{(5 + 7)} \right) \times 100\%$$

$$\left(\frac{12}{12} \right) \times 100\%$$

$$1 \times 100\% = 100\%$$

The system’s efficiency is 100%.



B. Level of Satisfaction

Table1. Respondent’s Level of Satisfaction on the Services of the System

System’s Services	Mean	Description
1. The ability to store and locate the student records in less amount of time.	4.80	Very Satisfied
2. The accuracy of the computation of PTA Fee	4.70	Very Satisfied
3. The speed in generating the receipt	4.77	Very Satisfied
4. The amount of time spent in processing the payment	4.70	Very Satisfied
5. The overall performance of the system	4.70	Very Satisfied
Total	4.73	Very Satisfied

Table 1 shows the level of satisfaction of the respondents on the services of the system. On the system’s ability to store and locate student’s record in less amount of time, the mean is 4.80, on the accuracy of the computation of PTA fee, the mean is 4.70, on the speed in generating the receipt, the mean is 4.77, on the amount of time spent in processing the payment, the mean is 4.70, and the overall performance of the system, the mean was 4.70. The overall evaluation on the system’s services is Very Satisfied, with a mean of 4.73

V. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the evaluation of the system, the following conclusions were drawn:

1. The system’s effectiveness is 100%, it implies that the system can successfully complete its task without errors.
2. The system’s efficiency is 100%, it implies that the system can complete its task in a shorter period of time.
3. The system’s clientele is very satisfied with its services

RECOMMENDATIONS

Based on the preceding findings and conclusions, the following series of actions are recommended:

1. Additional operators must be added in order to speed up the operations, it is suggested that each program will have its own operator.
2. Since the system is stand alone, it is recommended to be networked in order to centralize the data and make it multi-user.
3. Training of additional operators must be conducted to familiarize the system’s operation.

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AUTHORS’ PROFILE



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EDUCATION AND QUALIFICATIONS
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Doctor of Information Technology

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On-going (CHED Scholar)

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Graduated 2016

Master of Science in Computer Science

University of Negros Occidental-Recoletos
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Graduated 2006

College

Bachelor of Science in Computer Science

University of Negros Occidental-Recoletos
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Graduated 1997

Secondary

La Consolacion School,
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Graduated 2003

Elementary

Seventh Day Adventist School
Himamaylan, Negros Occidental
Graduated 1989

Work Experience

Associate Professor III
Head of Instruction
Iloilo Science and Technology University-Miagao Campus

Present

Part-Time Professor

College of Computer Studies Graduate Program
Central Philippine University
Jaro, Iloilo City
2006-Present

Part-Time Professor

Graduate Studies Program
Iloilo Science and Technology University-Lapaz Campus
Lapaz, Iloilo City
2006-Present

Computer Instructor

Palmares Computer College
Lapaz, Iloilo City
1997-2004

CERTIFICATIONS

Competency	Agency
Computer Hardware Servicing NC II	TESDA
Google for Education Basics Exam	Google for Education
IBM DB2 Academic Associate	IBM



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PROFESSIONAL AFFILIATIONS

President	Philippine Society of Information Technology Educators (PSITE) - Region 6
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President	
President	Iloilo Search Engine Optimization Organization
Senior Accreditor	Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACCCUP)
Member	Philippine State Universities and Colleges Computer Education and Systems Society (PSUCCESS)
Member	International Multidisciplinary Research Advocacy and Development Inc. (IMRAD)
Member	Google Educators Group
Member	International Association of Engineers

PUBLISHED RESEARCHES

Learners Accessibility and Adaptability to Technology

Asia Pacific Higher Education Research Journal (APHERJ) Vol 4, No 1 (2017)

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ISAT U Research Journal

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ISAT U Research Journal

An Evaluation of the Computer Literacy Training Extension Program of The Information Technology Division of Iloilo Science And Technology

University Miagao Campus

ISAT U Research Journal

Employer Feedback on B.S. Information Technology Graduates of Iloilo Science and Technology, University (ISAT U) Miagao Campus

ISAT U Research Journal

A Tracer Study of BS Information Technology Graduates

SIPC Journal

PAPER PRESENTATIONS

Parents Teachers Association Collection Management System

1st National Research and Development Congress on Technology and Vocational Education University of Northern Philippines Vigan City, Ilocos Sur

Development of Fuzzy Logic-Based Search Algorithm for Online Search Services

2nd International RDE Management Congress and 27th National PHILARM Convention Hotel Elizabeth, Baguio City May 23-25, 2017

Executive Information System for Loan Processing and Approval Using Two-way Verification Method for Multi-Purpose Cooperative

1st International Conference on Science and Technology Diversion 21 Hotel, Iloilo City November 30-December 2, 2016

The Dynamics of Learners in an Online Classroom and Social Media

4th International Conference on Education for Sustainable Development RECSAM, Penang, Malaysia October 25-27, 2016

Learners Accessibility and Adaptability to Technology

International Higher Education Research Forum 2016 Tagaytay International Convention Center Tagaytay City September 14-17, 2016

Online Research Portal

PSUCCESS 20th Annual National Convention University of Northern Philippines, Vigan City, Ilocos Sur February 24-26, 2016

School Event Notifications Through SMS (SENT: SMS)

International Higher Education Research Forum 2014 Heritage Hotel, Pasay City October 21-22, 2014

Proponent of the CHED Institutional Development and Innovation Grant

Concept Paper: Development of Research and Idea Incubation Hub for the Information Technology Department of ISAT U Miagao Campus

AWARDS RECEIVED

Best Performing Faculty – SIPC-WVCST Miagao Campus

Best Oral Presenter – ISAT U Miagao Campus In-House Review

Best Research Paper- ISAT U Miagao Campus In-House Review

Outstanding Dissertation – University of the Visayas, Cebu City

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