

Web-Based Student Identification Card System: An Alternative for School On-site Processing

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Abstract:- Identification or ID cards are used by many organizations nowadays to prove the person's identity. Educational institution provides ID cards to their students, faculty, and staff to show their connections to the institution. Several educational institutions have offices that will process the student's ID cards. In this study, the researchers developed a web-based application that addressed the problem of restraining the students to on-site process their ID cards. This application allowed the student to process their ID cards thru the use of the online application. Using this application students will no longer go to the office of the school site to process their ID cards. The application also helped the students to save their time and effort in processing their ID. The newly developed system will be deployed on the web and it can access by many devices with the internet browser and connected to the world-wide-web.

Keywords:- Web-based Application, Online ID Card Processing, and Online Transaction System.

I. INTRODUCTION

Identification (ID) cards are used by many establishments nowadays to prove the person's identity. Educational institution provides ID cards to their students, faculty, and staff to show their connections to the institution. Student ID card may have the summary of student information [1]. ID cards are useful to the students, it can be used by the students to avail discounts on their fare. It can also use as for identity verification for their purpose for such as for claiming money remittances and other purposes. Several educational institutions have offices that will process the student's ID cards. The students will go directly to that office to request and process their ID cards. In some institution, there is a specific office or department that services provide ID cards to the students. The processing of ID took place in that particular office and done it manually [2]. The student will directly request to the office. But due to the COVID-19 pandemic, students were restricted inside the school. This a measure to ensure the student's safety and to prevent the spread of the COVID-19 virus. In this study, the researchers developed a web-based application that addressed the problem of restricting the students to process their ID cards. This application allowed the student to process their ID cards thru the use of the online application. Using this application students will no longer go to the office of the student affairs and services to process their ID cards. This application also helped the students to save their time and effort in processing their ID.

II. FRAMEWORK OF THE STUDY

Figure 1 illustrates the framework of the study. It describes how information is processed to achieve the desired output of the system. The proposed system is intended to improve traditional ID card processing, from on-site processing to web-based processing.

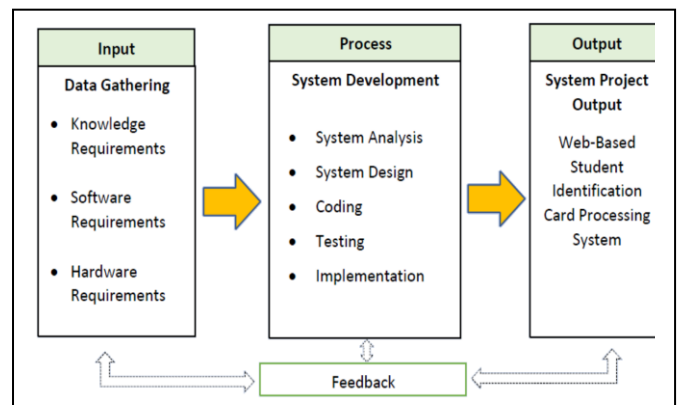


Fig 1. The Framework of the Study.

III. RESEARCH OBJECTIVES

This study aimed to develop a Web-based ID card processing system. The system allowed the students to process their ID cards via web-based technology. Specifically, this study aims:

1. To identify the tools and resources in the development of the system.
2. To design and develop a Web-based ID card processing system.
3. To evaluate the newly developed system in terms of functionality, reliability, usability, efficiency, and portability.

IV. TECHNICAL BACKGROUD

This section provides different literature and studies from previous researchers. It introduces the available resources and framework for the development of the entire study.

A. Web-based Application System

An online or web-based application can deliver information and services to users or other information systems using internet web technologies. Nowadays, a lot of firms employ web-based application systems. Firms can extend their geographic reach beyond their current physical location thanks

to Web-based apps [3]. It can reduce the time and effort of an individual who will use an online or web-based application. Some Web-based applications must be used to fully comprehend their utility. This type of application should be user-friendly, interactive, and responsive [4].

B. Web Tools and Application .

Hypertext Preprocessor or PHP and MySQL Technologies were used in the development of this project. PHP is a programming language used to design a webpage. PHP was a server-side scripting language designed specifically for the web. Within an HTML page, PHP was an embedded code that will be executed each time the page is visited [5]. On the other hand, MySQL is a database used for storing data and information. MySQL is a very fast, robust, Relational. The web-based application system is continuously improving. This may give a lot of opportunities for researchers. Based on the data gathered from the reviewed literature and studies, the researchers used information in the development of web-based ID card processing.

V. RESEARCH METHOD

In this chapter, the setting and design of the study were presented in this section.

A. Research Setting

This study took place at Tagoloan Community College (TCC) during the Academic Year 2020-2021. TCC is a community-based institution established in July 2003 at the Municipality of Tagoloan, Misamis Oriental. At present, has a population of 5,330 active students.

B. Research Design

Software Development Life Cycle (SDLC) is a methodology for planning, designing, building, and maintaining information systems. There is a lot of SDLC model proposed by different researchers [6]. The waterfall model is an SDLC sequential model that comprises five phases. Figure 2 shows the Waterfall model which starts from analysis down to the maintenance phases. It allows returning to the previous stage when the need arises but this provision should be used with care.

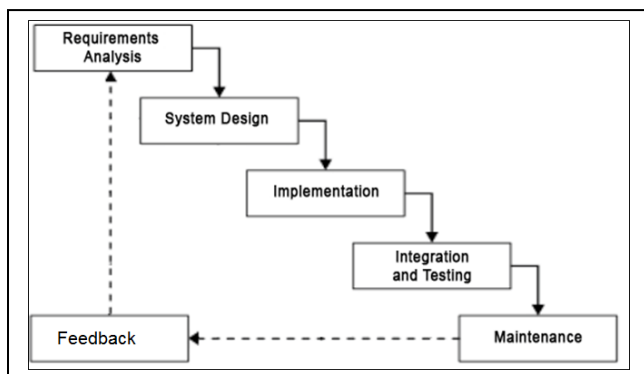


Fig 2. The Waterfall Model

C. Requirements Analysis

The first phase includes the gathering of data from available resources and understanding the things needed in designing. This also includes the function, and purpose of the newly developed system. The Algorithm used in the system was also identified and studied during this phase and the specifications of the input and output or the final product, are studied and marked. In gathering the data, the overall objective can be drawn based on the data gathered. The researcher conducted intensive research on what are the available tools in the open-source community for the development of the web-based ID card processing system. Data gathered from this phase will be used as the basis for designing the system in the next phase.

D. System Design

The requirement specifications from the first phase are being studied in this phase. This is where the designs of the system are prepared. The direction of System Design helps in identifying the hardware specification, and system requirements and also helps in defining the overall system architecture. After all the designs are ready, the coding of the software will be followed. In designing the system, the first objective of this study is initially achieved. The results are based on an interview being used in developing the system. In this phase, the researcher prepared some diagrams to visualize the development of the system. Programming tools were determined in this phase in the development of the Web-based ID card processing system.

E. Implementation

Based on the system design, the system is initially developed in small programs called units, and all the units were integrated into the next phase. Every unit is developed and tested for its functionality before it was implemented and tested as a whole system. In this phase, the researcher coded the system in the local machine and continued debugging the system. The application system was based on the proposed design as presented in the system design phase of the Web-based ID card processing system. In this phase, the first objective of this study will also be achieved.

F. Integration and Testing

In the integrating and testing phase, all the units developed in the implementation phase are integrated into a system after testing each unit. The designed system needs to go through a series of software testing to find out flaws or errors. A web-based application was deployed in a cloud server and ready for initial use. The system was first tested on a limited number of users to determine the errors in the system. Once the system was free from errors after the initial deployment, then officially launching was done. This phase also included the briefing and orientation of the software system to the actual pilot users. The pilot users were oriented on how to use the system and learn about the benefits of using the system.

G. Maintenance

In the maintenance phase, the system was monitored and supervised. It involved making modifications to the system or an individual component to alter attributes or improve performance.

H. System Evaluation Procedures

The researchers conducted a survey from 30 randomly selected students that served as pilot users. Using International Standard Organization (ISO) 9126 questionnaire. ISO 9126 determines the functionality, reliability, usability, efficiency, and portability of the newly developed system [7]. The questionnaire contains 4-way Likert scale to denote the degree of agreement (e.g., 4 = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree). A simple mathematical computation was used to find the mean as shown in figure 3.

$$\text{Weighted Mean} = \frac{\sum_{i=1}^n (xi * wi)}{\sum_{i=1}^n wi}$$

where:

Σ = the sum

w = weights and

x = value

Fig 3. Weighted Mean Formula

VI. RESULT AND DISCUSSION

The researchers used the Online Transaction Processing (OTP) model. Figure 4 shows that students used their personal owned or borrowed devices that have an access to the internet browser and the world-wide-web. The role system administrator is to monitor the flow of the transaction.

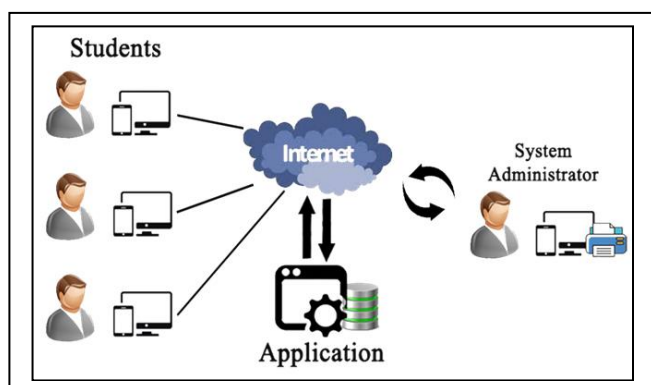


Fig 4. Online Transaction Processing of ID Card Processing

The process includes three (3) phases. These phases are the following:

- Student ID Card Application.** In this phase, the student was required to log into the Student Portal to apply for an ID card.
- ID Card Approval.** In this phase, the system administrator monitored and approved those students that have completed the application. Additionally, the system

administrator can print the ID card and it will be ready for release.

- ID Card notification for release.** In this phase, the student will notify (via email) that their requested ID is ready to be released.

A. To identify the tools and resources in the development of the system.

Some tools and resources were needed in the development of the system. Some of this was considered open-source. These includes the following:

Software:

- Apache 2.4.28 (PHP 7.1.14)
- MySQL 5.3
- CodeIgniter 3.1.7
- Bootstrap 3.3.75

Hardware:

- Any CPU (Intel i5/ i7/ Xeon recommended for web-hosting)
- 1 GB of RAM (at least 8GB for recommended for web-hosting)
- 40 GB HDD Free Space

B. To design and develop a Web-based ID card processing system.

Designing a database for an application is important. This utilized the storage of data to store more information and it will be available for future use. In this study, the researchers used an Entity Relationship Diagram (ERD) to illustrate the database design used in this study. Figure 5 illustrates the database of the system.

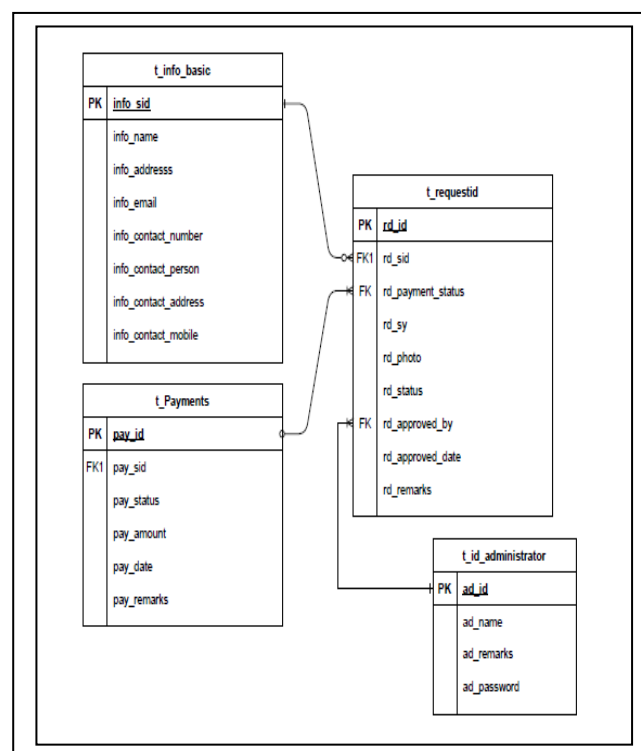


Fig 5. Web-based ID card processing system ERD

➤ **Objective 3:** To design a friendly user-interface for the system.

User-interface is an important component of a computer application. It allows the end-user to interact with the computer system. In this study, the researchers developed a friendly web-based user interface using HTML, CSS, and JavaScript technology.

Figure 6 shows the log-in pages of the system. This allows the students to log into their accounts.

Fig 6. Log-in page of the system

Figure 7 shows the terms and agreements of the system. This page allows the students to read the terms, agreements, and rules in using the newly developed system.

Fig 7. Terms and agreement form.

Figure 8 shows the student ID card application. On this page, the student will update their information such as the latest ID photo, contact person in case of emergency, and other important information.

Fig 8. Student ID card Application

Using JavaScript technology, the system can accept the digital signature of the student. Figure 9 shows a signature panel. This panel allows the students to attach their signatures. The attached signature will be converted into an image file and it will be securely stored in a web hosting server.

Fig 9. Student's Signature Attachment form.

After the submission of the required information, a status preview page will be displayed. Figure 10 shows a page of the student ID. This allowed the students to review their information.

Fig 10. Status Preview form.

C. To evaluate the newly developed system in terms of functionality, reliability, usability, efficiency, and portability.

Using ISO 9126, the researchers float a set of questionnaires to a group of students. Table 1 shows that the majority of the students are male.

Table 1. Data of the result of usability testing in terms of functionality.

Category	Frequency	Percentage
Female	12	40%
Male	18	60%
Total	30	100%

The data gathered from the group of students were interpreted according to the hypothetical measures in table 2.

Table 2. Data of the result of usability testing in terms of functionality.

Range	Indicator
3.50 - 4.00	Strongly Agree
2.50 - 3.49	Agree
1.50 - 2.49	Disagree
1.00 - 1.49	Strongly Disagree

Table 3. Data of the result of usability testing in terms of functionality.

Specifications	Mean	Indicator
The system can produce expected results.	3.87	Strongly Agree
The system can interact with other system.	3.80	Strongly Agree
The system equipped with acceptable security measure.	3.70	Strongly Agree
The system can meet existing requirements.	3.80	Strongly Agree
Weighted Mean	3.79	Strongly Agree

Table 3 shows that the functionality with a weighted mean of 3.79 which indicate that the system is functional as reviewed by a group of students.

Table 4. Data of the result of usability testing in terms of reliability.

Specifications	Mean	Indicator
Most of faults can be eliminated over time.	3.67	Strongly Agree
The system can handle errors.	3.77	Strongly Agree
The system can resume working and restore data.	3.70	Strongly Agree
The system can meet existing reliability standards.	3.90	Strongly Agree
Weighted Mean	3.76	Strongly Agree

Table 4 shows the reliability with a weighted mean of 3.76 which indicate that the system is reliable as reviewed by a group of students.

Table 5. Data of the result of usability testing in terms of usability.

Specifications	Mean	Indicator
The system can be understood easily.	3.70	Strongly Agree
The user can learn to use the system easily	3.83	Strongly Agree
The system can be operated with minimal effort.	3.77	Strongly Agree
The interface of the system is attractive.	3.80	Strongly Agree
The system can meet existing usability standards.	3.77	Strongly Agree
Weighted Mean	3.77	Strongly Agree

Table 5 shows the usability with a weighted mean of 3.77 which indicate that the system is usable as reviewed by a group of students.

Table 6. Data of the result of usability testing in terms of efficiency.

Specifications	Mean	Indicator
The system can behave in a timely manner	3.80	Strongly Agree
The system can meet existing efficiency standards	3.77	Strongly Agree
The system can be adapted easily.	3.87	Strongly Agree
Weighted Mean	3.81	Strongly Agree

Table 6 shows the efficiency with a weighted mean of 3.81 which indicate that the system is as reviewed by a group of students.

Table 7. Data of the result of usability testing in terms of portability.

Specifications	Mean	Indicator
The system can be installed easily.	3.77	Strongly Agree
The system can work with existing system/software	3.73	Strongly Agree
The system can be replaced with a similar product.	3.70	Strongly Agree
The system can meet existing portability standards.	3.83	Strongly Agree
Weighted Mean	3.75	Strongly Agree

Table 7 shows the functionality with a weighted mean of 3.75 which indicates that the system is portable as reviewed by a group of students.

VII. SUMMARY

This study aimed to develop a system application that allows student to process their ID cards using a web-based application. The newly developed system served as an alternative way to request and process a student ID card in a school. Using this application students will no longer go to the office of the school site to process their ID cards. The application also helped the students to save time and effort in processing their ID. The newly developed system is deployed on the web and it can access by many devices with the internet browser and connected to the world-wide-web.

VIII. CONCLUSIONS

This research developed a system that can be an alternative way of processing School ID cards. This will allow the students to process their ID cards using Internet Technology. The system can be used by the students to lessen their time and effort in requesting their ID cards. This System can be used not only during the COVID-19 pandemic. This system can save time and resources for an institution.

RECOMMENDATIONS

There were challenges that the researchers encountered during the development of the system. Based on the findings the following recommendations were presented:

- The study suggests that a Web-Based Student ID card Processing Application may be considered as an alternative for on-site ID card processing.
- Researchers suggest a series of system evaluations before the implementation of the system to minimize or even eliminate all the system errors.
- The study also suggests the development of a native version of a mobile application and the integration of SMS technology for notification.
- The security mechanism of the system may be improved to protect the privacy of the users.
- Further research may be conducted in terms of feedback on the developed system.
- Finally, future research may be conducted to make use of the results of this study for a deeper analysis of issues and concerns involving the maintainability and sustainability of the system.

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