

The Development of Web-Based Application of Registration System

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Abstract. *The purposes of this research were to develop a Web-Based Application of Registration System and to study users' satisfaction. The research problem is traditional student enrollment. Students must come to the college to write the registration form and the registration staff keyed the data into excel program one by one after the students had registered for all subjects. The registrar must bring the information to prepare the transcript one by one. Which takes a long time and there are errors such as duplicates, typed wrong course names incorrect course structure wrong grade point average, etc., from such problems, thus causing the researcher study and develop a system to solve this problem. In this research, there were 497 samples (registration and evaluation Office, and students) from Pitchayabundit College, Nong Bua Lamphu, Thailand. The overall satisfaction assessment result was very satisfactory ($\bar{x}=3.95$). A web-based application was designed, developed, and implemented as a web portal that enables different parties working with higher education general teaching to benefit from.*

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1. Introduction

The Ministry of digital economy and society of Thailand has the policy to encourage individual organizations in Thailand to implement information and communication technology (ICT) within and outside their organization to support a new and modern society paradigm [1]. Over the years notable achievements in the use of internet networking and electronic devices such as smartphones, tablet PCs are in great use and have the potential to reduce costs of data storage and the error rate of the paper-based method of data collection [2]. Due to the COVID-19 epidemic situation, various agencies have to change their operating methods to avoid the spread of disease. The vast majority of teaching and learning in

higher education is online. Coordination is also in an online form to reduce exposure, minimize meetings in class but communication that has to be converted from documents to an online format is a sudden shift in some organizations any organization that can adapt will survive. Under the globalization trend with COVID-19 as an impact, therefore, the use of information technology in the operation of the organization. Therefore, considered necessary such as coordinating send documents via the electronic system or via a web application developed specifically for that agency in order to be able to communicate, send documents, and view the status of various information. The Web-based application is an application developed for use in the WWW style. Online warehouse management system, online customer relationship management system, online registration system, etc.[3].

Registration and measurement is the central unit of Pitchayabundit College which has a duty to support the mission of the institution in the field of teaching and learning from admission until graduation. Previously, the data was stored in the form of documents and the data was imported into the excel program, which caused time-consuming and difficulty in sorting the data. The registrar often have a difficult time to understand the work system and cannot find the document as it should be. The conventional manual system suffers the following problems:

1. Data collected, such as statistics of graduate students and statistics of students being admitted sometimes the data does not match.
2. The form for filling in the form to submit grades for each faculty often encounters different forms of problems.
3. Forwarding data between the registrar and different departments in the organization using secondary storage can make the data insecure [4][5]. Using information technology, web applications are a security mechanism and privacy can be maintained [6].

The web-based application makes the registration and measurement department work easier and more convenient. Currently, the registration and measurement work has adopted the information technology system for maximum

efficiency. The information is accurate and more convenient to use. Likewise, it can preview an online register timetable information, grades, and check expenses, etc. To meet the needs of users, including registrars, students, teachers, and are satisfied with the use of the institution's online registration system [7] [8].

2. Literature Review

2.1 Web-Based Application

The web-based application is an application developed for use in the www style. Online warehouse management system, online customer relationship management system, online registration system, etc. The web-based application will be installed on the webserver, then users can run the program through a web browser at all. Which provides ease of access and web-based also has a much lower cost of preparation [9]. Programs used to develop web apps such as Perl can be developed through the design of programming language. PHP, ASP, JavaScript, VB script, JSP, Java, and other applications must be connected with the database system [10] [11].

2.2 ASP.net

ASP.net refers to technology for web development. Web applications and web services it is part of the dot net framework developed by Microsoft [12].

2.3 MySQL Database

MySQL is an open-source relational database management system based on SQL. MySQL is designed and optimized for web applications and can run on any platform. MySQL works as a database server and allows multiple users to manage and create multiple databases [13] [14].

The researcher studied documents and research related to the online registration system, course management system, transcript, submitting online grades [3][4]. It was found that most of the researches used both ASP language, PHP and MySQL databases, Oracle in the development [5][6]. It has a login system that separates users such as registrar staff, students, teachers, administrators [8][11]. Each user has different access rights for data security [12][13].

3. Methodology

3.1 Sampling Process

There were 771 Sample groups that were chosen specifically from 3 registration offices, and 768 students. It is a system developed for the use of students, the registrar, and faculty members to use as a medium for communicating information about teaching, class schedules, academic results, and others according to the user's requirements. The researcher selected a specific

sample from real users. Which know the exact number of population as in equation (1).

$$n = \frac{N}{1 + Ne^2} \quad (1)$$

; where

e is sampling tolerance
 N is population
 n is number of samples

The information is stored in an online database system with systematic design and development according to guidelines therefore rest assured that information is secure in information systems. And can actually be used through on website. Each user must login to the system, each user has different access rights to Fig. 1.

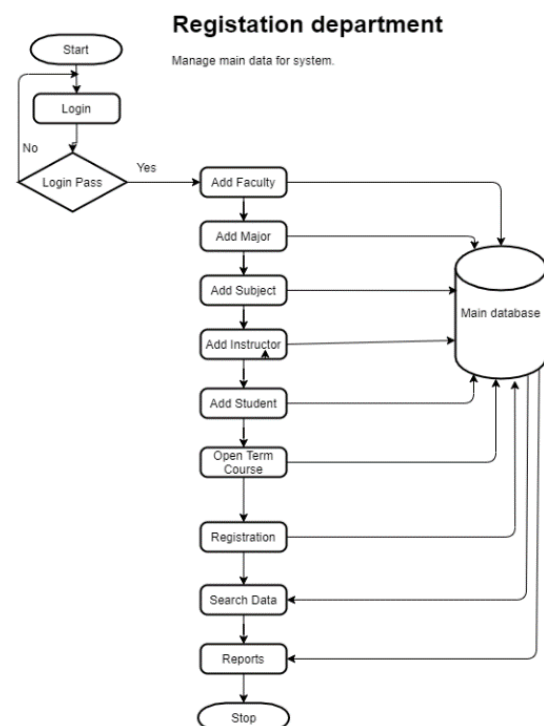


Fig. 1 Flowchart of system.

3.2 Tools and Data Collection

The research instruments were the web-based applications of registration systems and questionnaires. Due to the situation of the COVID-19 epidemic, the researchers collected data using google forms. There were 497 respondents, representing 64.46 %.

The data collected from the questionnaires were analyzed by using statistical evaluation: percentage, mean and standard deviation in equation (2).

$$\bar{x} = \frac{\sum x}{N} \quad (2)$$

; where

- \bar{x} is mean
 $\sum x$ is the sum of the satisfaction scores
 N is the number of points in each topic

Use case diagram of the development of Web-Based Application of registration system include add or edit faculty, major, instructor, subject, student, course term, teacher schedule, student into subject, search data, and report data to executive to Fig. 2.

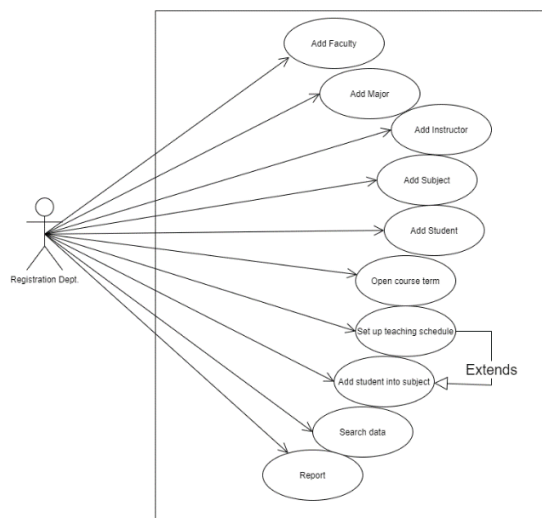


Fig. 2 Use Case Diagram.

3.3 Development of Web-Based Application of Registration System

Methodologies are step-by-step procedures to carry out the development activities in different phases of a System Development Life-Cycle (SDLC) [15], organizing coherent sets of behavioral and technical conducts, prescribing how to address development problems with the required functionality, and quality [16]. Evaluated the system's performance by 5 experts [17]. Researchers study and analyze the needs of registered offices and students to design the flowchart of the system.

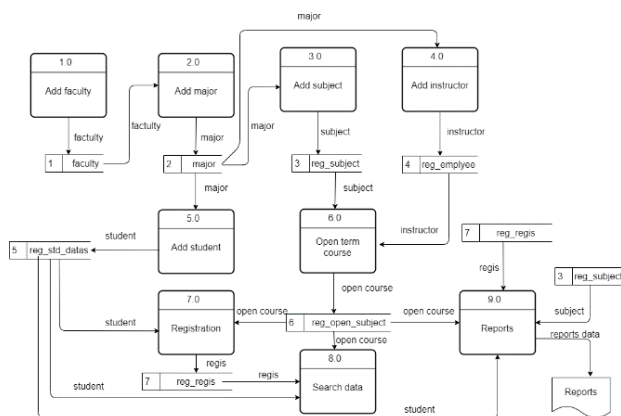


Fig. 3 Dataflow Diagram.

In this research, the researcher developed the system with visual studio 2008 and Microsoft.NET framework 3.5 use MySQL as database, dataflow diagram to Fig. 3 and E-R diagram to Fig. 4.

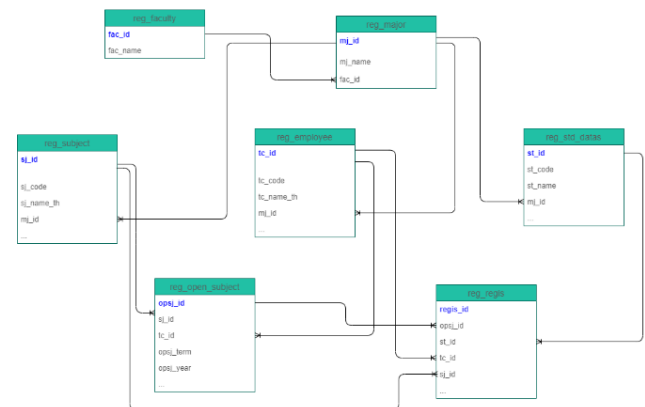


Fig. 4 E-R diagram of database.

4. Research Results

4.1 Results of the Developed Web-Based Application of Registration System

This session presents the test results obtained from the developed web-based application of registration system. The first step, the user has to login to the system through the panel as shown in Fig. 5.

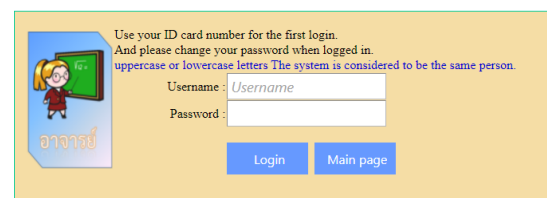


Fig. 5 Login page of the registration system

Once the user has logged in, a menu window will be displayed according to their access rights, in this example, the rights of the registrar have the following: main menu, faculty major, subject, instructor, student, register, accounting, search, report, change password, and log out to Fig. 6.



Fig. 6 Main menu

The working process of the system is as follows.

- 1) Open the course
- 2) Search for the instructor, study date, class time and classroom
- 3) Insert students into each subject to Fig. 7

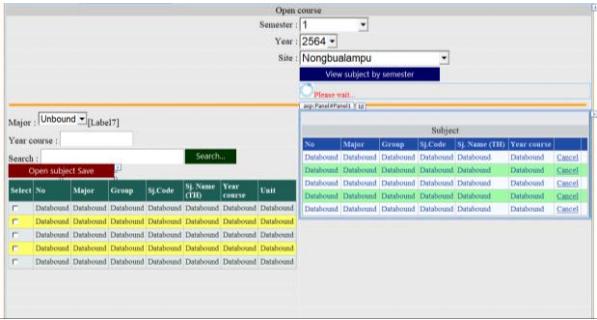


Fig. 7 working process

The registrar can open courses to students and can unhide or showing results in the system to Fig. 8.

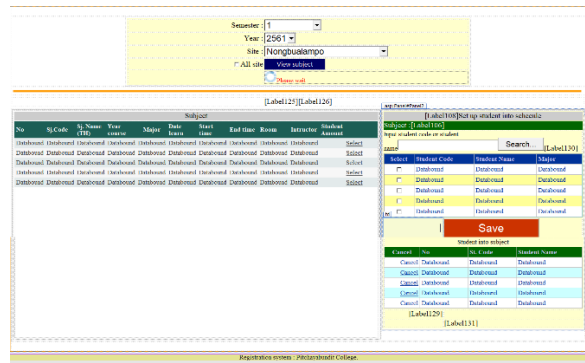


Fig. 8 User interface design

Course setting and the assignment of teachers in each semester could be set as shown in Fig. 9.

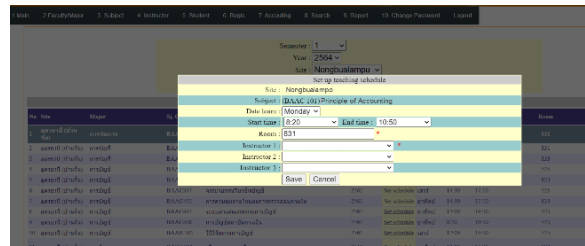


Fig. 9 searching for information

4.2 Results of User Satisfaction Study

The satisfaction of the users of the system was studied and the results were as follows: Table 1. The answers were gained using a Likert scale with a scale ranging from 1 to 5, where 1 means “least satisfied” and 5 mean “most satisfied” [18]. The overall satisfaction assessment result was very satisfactory (\bar{x} =3.95). When analyzing each aspect, it was found that searching for information that meets the needs of system users had the highest average (\bar{x} =4.12). The second is information retrieved is up-to-date (\bar{x} =4.05), screen output be appropriate (\bar{x} =4.01), efficient storage (\bar{x} =3.99), able to access information conveniently and quickly (\bar{x} =3.94), the database system is easy to use. Users do not spend too much time learning (\bar{x} =3.94), the images used are sharp and clearly convey the meaning (\bar{x} =3.93), data processing is accurate (\bar{x} =3.89), the ability

of the system to meet the needs of multiple levels of users and data processing is fast. (\bar{x} =3.88), convenient for long-term improvement and advances in technology (\bar{x} =3.85).

Item	Mean	Satisfaction level
1. ease of login	4.00	very satisfied
2. ability of the system to meet the needs of multiple levels of users	3.88	very satisfied
3. convenient for long-term improvement and advances in technology	3.85	very satisfied
4. able to access information conveniently and quickly	3.94	very satisfied
5. Images used are sharp and clearly convey the meaning	3.93	very satisfied
6. Database system is easy to use. Users don't waste too much time learning	3.94	very satisfied
7. Efficient storage	3.99	very satisfied
8. Searching for information that meets the needs of system users	4.12	very satisfied
9. Data processing is accurate	3.89	very satisfied
10. Data processing is fast	3.88	very satisfied
11. Information retrieved is up-to-date	4.05	very satisfied
12. Screen output be appropriate	4.01	very satisfied
Total	3.95	very satisfied

Table 1 Satisfaction of users of the registration systems

5. Discussions

With the development of a web-based application of registration system and assessing the satisfaction of the users of the system, it was found that there was a high level of satisfaction, especially in the search for information that matched the needs of the users of the system (\bar{x} =4.12). This is because the researcher developed the system according to the SDLC system development cycle principle and obtained the idea from analyzing the needs of users of the registration department, teachers and students to develop and test until it can be used in practice at present. Consistent with the research of [19] found that the demand analysis risk analysis and systematic software development help programs to be efficient and secure. The step-by-step development of the system is a great help in debugging the system. Consistent with the research of [20] it has been found that effective web application development creates meaningful security dashboards for each stakeholder ranging from executives, directors, program managers to developers. Consistent with the research of [21] found that the web application can be used in the organization to help strengthen to alleviate system security problems. Using the system is easy for everyone was accessible on all devices especially mobile phones, smartphones, everywhere and at all times, the information is up-to-date and actually works [22].

6. Conclusions

A web-based application was designed, developed, and implemented as a web portal that enables different parties working with higher education general teaching to benefit from. The advantages of the developed system are students can register online from anywhere. Especially

during the COVID-19 outbreak, teachers and advisors can view student information and can submit grades online. Registration officers can easily add course information and making transcripts easier.

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Biographies



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