Student Support Services with Remedial Management System

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Abstract **– An innovative approach to support student services for an educational institution is proposed in this paper. This approach is applied to integrate the student centralized services to help problem student who probably dropping out the university. The student support service workflow information system (SSS WIS) is developed to support the approach. The system consists of: (1) student information system to analyze the problems that will occur in the following area: financial, health, social and psychological aspects, (2) the notification and appointment system to solve problems, and (3) troubleshooting system. The SSS WIS can be used to systematically support the students. It can solve the student problems on demand. This affects the higher retention rate. In addition, students can graduate from the university on time.**

Keywords **– Student Support Services, Remedial Management System, Workflow Information System.**

1. Introduction

In the United States of America, the systematic student support services are provided by the government support to help high school students prepare to study in higher education until they graduate. It began with the adoption of the Upward Bound Program in 1965 to support the underserved high school students e.g. low-income and non-degree parents.

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There were two goals of this program: increasing rate of high school graduates attending higher education and increasing rate of graduation in higher education. Later in 1984, two more programs were launched: the student support services and talent search program. The first program aimed to increase the retention rate and suggest work alternatives for higher education students. The second program aimed to select the talent student to study in the higher education. All three programs: Upward Bound, the student support services and talent search program, are well-known as the TRIO program. These programs are designed and implemented to increase the opportunity of graduation in undergraduate program. Subsequently, the student support services have been designed to be more appropriate as a factor in keeping students from moving to another university. It also provides opportunities for students to complete their course in a timely manner [1]. Therefore, universities in the United States will emphasize on student services [2].

In Thailand, the student support service is like a distribution model where any sub departments have the service system of their own. For instance, financial is in the responsibility of the finance department, student activities are in the responsibility of the student affair department. There is no systematical remodeling and integrating the student support service. Thongkrab [3] studied the creation and developed the management model of student affairs for higher education in the private sector, and found that the work of the students of many higher education institutions was still experiencing problems in the field of education. Most of the problems arise from the management system. Student work is not developed as it should be. The student affairs of higher education institutions now face many difficulties and obstacles. For example, students do not dare to express their ideas, lack of confidence in themselves, embarrassed to participate in activities. Another important reason is that they are afraid of the results of their study will be downhill, they cannot learn as good as their friends, and the problem with the consultants is great However, there are also many students who may not ready to learn, such as financial problem, health problems, no learning motivation, cannot adapt to

higher education, including adapting to friends and the environment. Although higher education institutions in Thailand have student affairs departments that provide various services to help students, the problems can be summarized as follows.

1) In Thailand, the student drop-out rate is twenty-five percent [4]. Having good student support services will help maintain retention without dropping out. Thus, students coming from poor families or underprivileged students and students who have health problems will have more opportunities to succeed in higher education. Chantawong [5] studied the factor affecting the dropout. There are three factors: education, financial, and lecturers. Each aspect can be alleviated by providing services to students. This issue will be important in this research.

2) Good student support services system can help the university to boots student enrollment. The statistic of students in the universities have lowered the dropout rate, the higher the retention rate was, the better the incentives for those who apply. Normally, students have a high dropout rate of 20% - 30%, so keeping students for 4 years will help improve the university status.

In the past, there was no information management system about student support services (SSS). The old SSS had to work if and only if the students need help. After the students had told their problem, the officer or advisor gave them the way to solve problem. However, there was no system for the problem management and monitoring after the advices.

In the research and development aspect presented in this article, the researcher proposes an active process using information technology to identify which students have problems. Then, appoint to consult with the SSS to discuss the problem at any level and how to fix with SSS WIS systematically monitors system performance.

2. Related Work

Student Support Services Studies, Tinto [6] developed a model of student retention in higher education, shown in Figure 1.

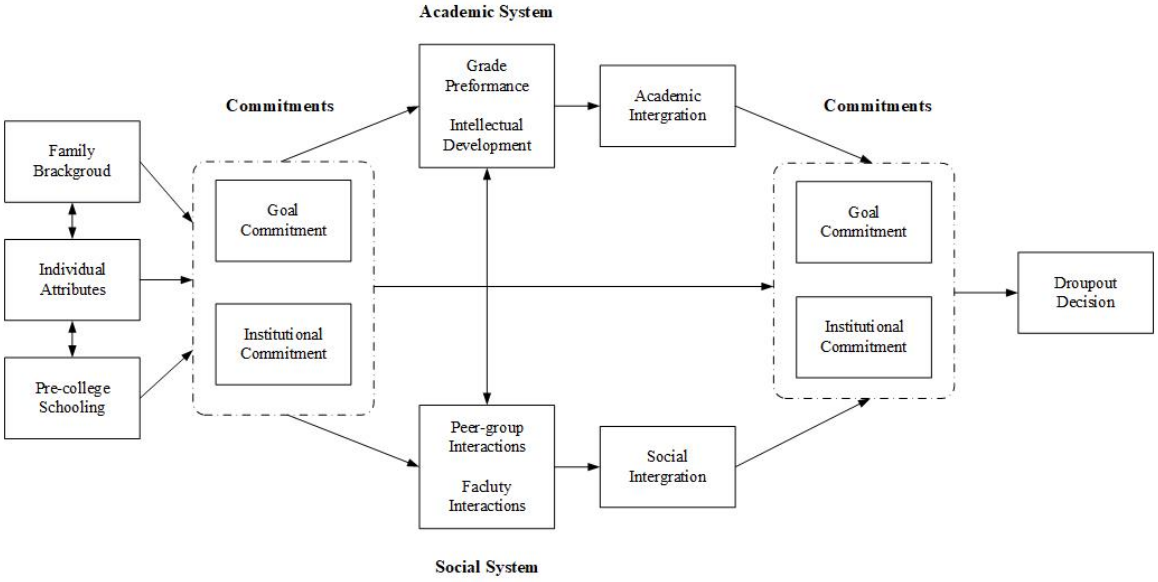

Figure 1. Tinto's Student Integration Model [*6, p.95*]

This model demonstrates student interaction with service agencies of the university. Tinto considers the potential and background of students such as personal characteristics, skills, financial status, and past school academic record. In addition, Vincent pointed out that the experience with social activities in the university affect the continuous leaning in the first enrollment university without transferring to another university. Tinto's Student Integration Model shows that students are constantly changing their minds while studying, and this model also demonstrates the internal and external environments affect students' intentions and the university attentions to support students' learning until graduation. External factors affect learning consisting of the process of learning and teaching that is a matter of academic, living, and participation in activities, which is an informal factor in society.

Another important concept of engaging and demanding of students on campus is the theory of Astin [7] on the involvement of learners in his work about the achievement of academic excellence. Astin explained that students who are involved with universities tend to have better relationships than those who do not and likely to remain until graduation while students who have no participation tend to resign. Participating students may participate in co-curricular activities, volunteer activities both on

and off campus, and/or maybe work for the university. And Kuh [8] also states that student participation shows that students are taking time and effort to complete their activities with the goal on graduation. Schools are also devoting their efforts to providing effective support services. Britto & Rush [9] also advocate the concept that student retention in higher education is at an all-important level during the past years by explaining the efforts of Lone Star College-Online and the student support services unit is responsible for creating and delivering a full range of student services designed to increase student retention. Mrija [10] extensively described that the important factor of graduation is the student support service of the university. Chuah & Lim [11] defined that student retention rate is very important. The university should have the information system which monitors the student progress and gives advices for student troubleshooting.

For the development of information technology systems to support the operation of the SSS, it is not present in the formal research papers. Therefore, SSS WIS is considered to be an information technology that has been designed and developed to improve the quality and efficiency of the information for Student Support Services.

3. SSS Workflow Information System

3.1 Architecture

Management of the educational support for students to be able to successfully complete the course is according to the integration strategy. The Student Support Service (SSS) of the various departments of the university has to be a unity and must develop a problem analysis system for students. In this paper, we offer a solution by using the appropriate SSS and track the solution. The life cycle of the SSS will start at the student registration, payment, orientation until the student completes the degree. In Thailand, it may take 4-8 years for graduation according to the rule of the Ministry of Education.

Developing procedures from all departments that provide SSS services is difficult to achieve, since all departments are familiar with manual operations and also require a higher budget than the institution can support. So, this research is to develop a system for tracking the various processes that have been accomplished in accordance with the plan. The SSS workflow architecture is designed to support SSS operations in a systematic and responsive manner to the needs of the administrators, preferred service, and support all students to achieve their goals.

The development of this innovative information system is the integration of information to be analyzed and predicted to help all students with problems. The system will contact students who have problems to solve problems throughout every semester until the problem is resolved to ensure the administrators that they take good care for their students.

SSS WIS is a client system that supports the SSS processes as shown in Figure 2. The system is designed with the following structure:

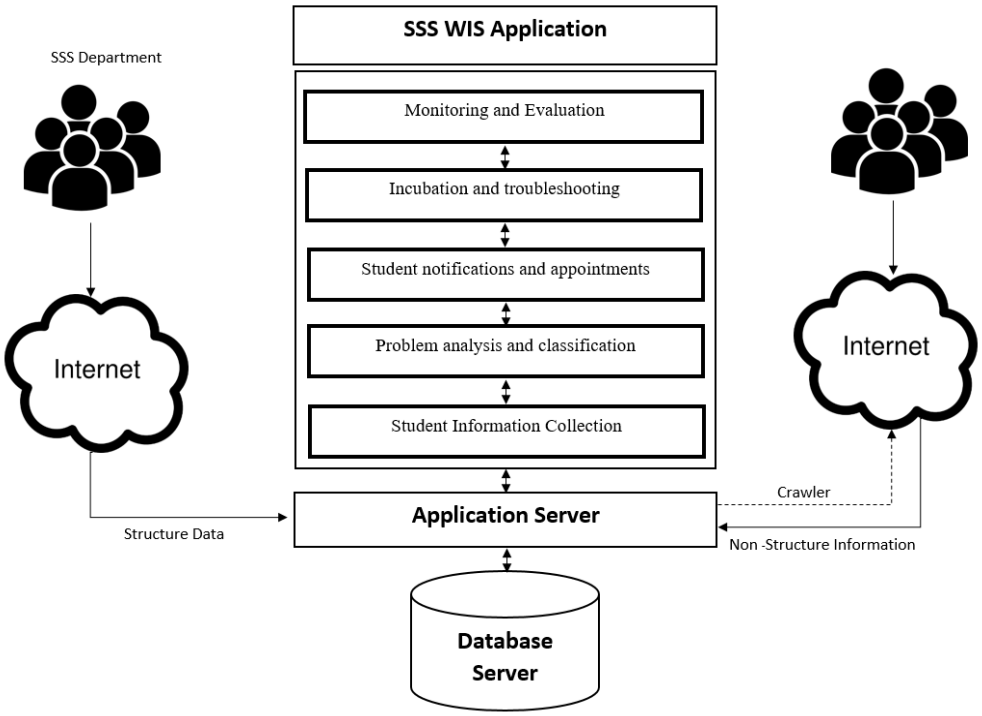

Figure 2. Architecture Structure of SSS WIS

3.2 Workflow Information System

Generally, information systems are data models that are processed, stored, and applied to the work. This system will be the backbone of the educational information system that will have major systems such as registration system, payment system, student database, academic quality assurance system, academic System media management, and system management information system, etc.

In order to automate the university system, it has to automate many tasks performed manually by analyzing the workflow in the student support services. The process can analyze the design as a workflow. The system offered to support student services is called SSS workflow.

SSS workflow is an information system that supports the operation of the SSS service of an institution covered from the registration point to the end, i.e. student's graduation.

The SSS workflow system consists of 5 parts:

- Student information collection
- Problem analysis and classification
- Notifications and appointments
- Incubation and troubleshooting
- Monitoring and Evaluation.

3.2.1 Student information collection

The data collection section aims to gather information about the factors that will affect the student's learning. This will be a barrier on coursework completion. The information gathered will come from sources such as:

1) Use learning outcomes and behaviors which the instructors and other teachers who teach the students can be collected and summarized.

2) Use information from academic affairs departments (grades and attendance) from student affairs department (jointly community club activities) from the finance department (Payment of tuition fees) from the education registration department (about the family matters)

3) Use data collected by Student Crawler from social media, where student crawler software collects social media activities from Facebook, website, IG related to target students to create a Watch List by pulling the list of students to screen them into a Qualified Watch List or QWL, which are the lists of students who have to enter the incubation process.

3.2.2 Problem analysis and classification

The data collected by the QWL student tracker will be classified into different problems for each student. There may be many problems. In this case, the problem may be identified in five areas as follows:

- Learning: Considering the consistency student attendance
- Finance: Considering the family income, tuition fee arrears and other fees
- Society: Considering the student activity attendance in and out of the university
- Health: Considering the congenital disease which appears in the resume, advisor report or the mèdecin traitant
- Psychology: Considering the abnormal behavior which appears in the advisor report or the university officer

3.2.3 Notifications and appointments

When the SSS WIS system is alerted, the SSS will generate a file of each student's information in the notification system. Students will be contacted directly, through e-mail and using official letters to make appointments for in-depth interviews to understand the problems, causes of problems, student restrictions, and consider the service approach of the university to solve problems or alleviate the problems of students. This can be summarized into 3 cases as follows:

- Having a solution.
- No solution.
- Postponing problem solving.

3.2.4 Incubation and troubleshooting

1) In case there is a solution to the problem, the university provides appropriate student support services. Those services are classified according to the nature of the problem as follows.

(1) Learning Problem

Services that will help students' learning as the following:

s_{11} = Get Tutoring Services from fellow students

s_{12} = Get Tutoring Services from clubs

s_{13} = Get Tutoring Services from teachers

s_{14} = Register for a consultation Online for e-learning

⋮

s_{1j_1}

(2) Financial Problem

Services that will help students' financial issue as the following:

f_{21} = University scholarships
f_{22} = Research assistant
f_{23} = Teaching assistant or lab assistant
f_{24} = *Part*-time work at the library
f_{25} = Part- time work at the faculty
f_{26} = Education loan from government sector
f_{27} = Education loan from private sector
$\vdots$
f_{2j_2}

(3) Health Problem

The following services are available for health promotion.

h_{31} = Temporary stop studying
h_{32} = Leave off the study or status maintenance
h_{33} = Get physical therapy service
h_{34} = Health checkup service
h_{35} = Get health promotion service
h_{36} = Non-Smoking service
h_{37} = Get alcohol abuse service
h_{38} = Get drug abuse service
$\vdots$
h_{3j_3}

(4) Social Problem

The services that will help to have a positive relationship as follows:

c_{41} = Join the volunteer club
c_{42} = Join the music club
c_{43} = Join the volunteer camping club
c_{44} = Join the environmental club
c_{45} = Join the traditional festival
c_{46} = Join the traditional football
$\vdots$
c_{4j_4}

(5) Psychological Problem

Service for Students with Family Problems

m_{51} = Meet the doctor for advice and treatment for stress of overdose.

m_{52} = Meet a counselor to introduce and stress of the problems from low income families in order to work for income earners.

m_{53} = Meet a counselor for suggestion and release stress of the problem from the game.

m_{54} = Meet a psychiatrist for suggestion and release the stress caused by love.

m_{55} = Meet the teacher in psychology and Buddhism to release stress from gambling.

m_{56} = See the doctor for advice and healing the problem caused by alcohol and drugs.
$\vdots$
m_{5j_5}

2) In the absence of a solution

If it is about learning it may be possible to select a branch that the students does not like or is too difficult. For instance, the student who naturally weak in mathematics but study in economics or mathematics program, they cannot get a good grade in this program. In that case, the student may change the branch or faculty. However, in some cases, it may be necessary to resign. This is the best choice for the student.

3) In the case of postponement

In this case, it will be the next appointment because of some issues; the problem may be waiting for some information to continue.

3.2.5 Monitoring and evaluation

Students who are in QWL and are incubated will also be in Incubate List (IL), which must be tracked to be recommended or operated and get each service from scheduled.

The restoration result will be finalized at the end of the term whether the problem persists. If it still exists, may offer more ways. Or the students' problems have been resolved, the student's name is removed from the IL account and removed from the QWL.

4. Implementation and Evaluation

4.1 System Implementation

SSS WIS is implemented by BPM (Business Process Management) whose workflow engine is the main mechanism. However, the UI and data used are designed [12].

Referred to the SSS WIS architecture in Figure 2, the student support services processes can be divided into procedures as the following:

- Student data collection - 3 procedures
- Problem analysis and classification - 7 procedures
- Notifications and appointments - 2 procedures
- Incubation and troubleshooting - 13 procedures
- Monitoring and Evaluation - 3 procedures

All of these procedures are shown in Figure 3.

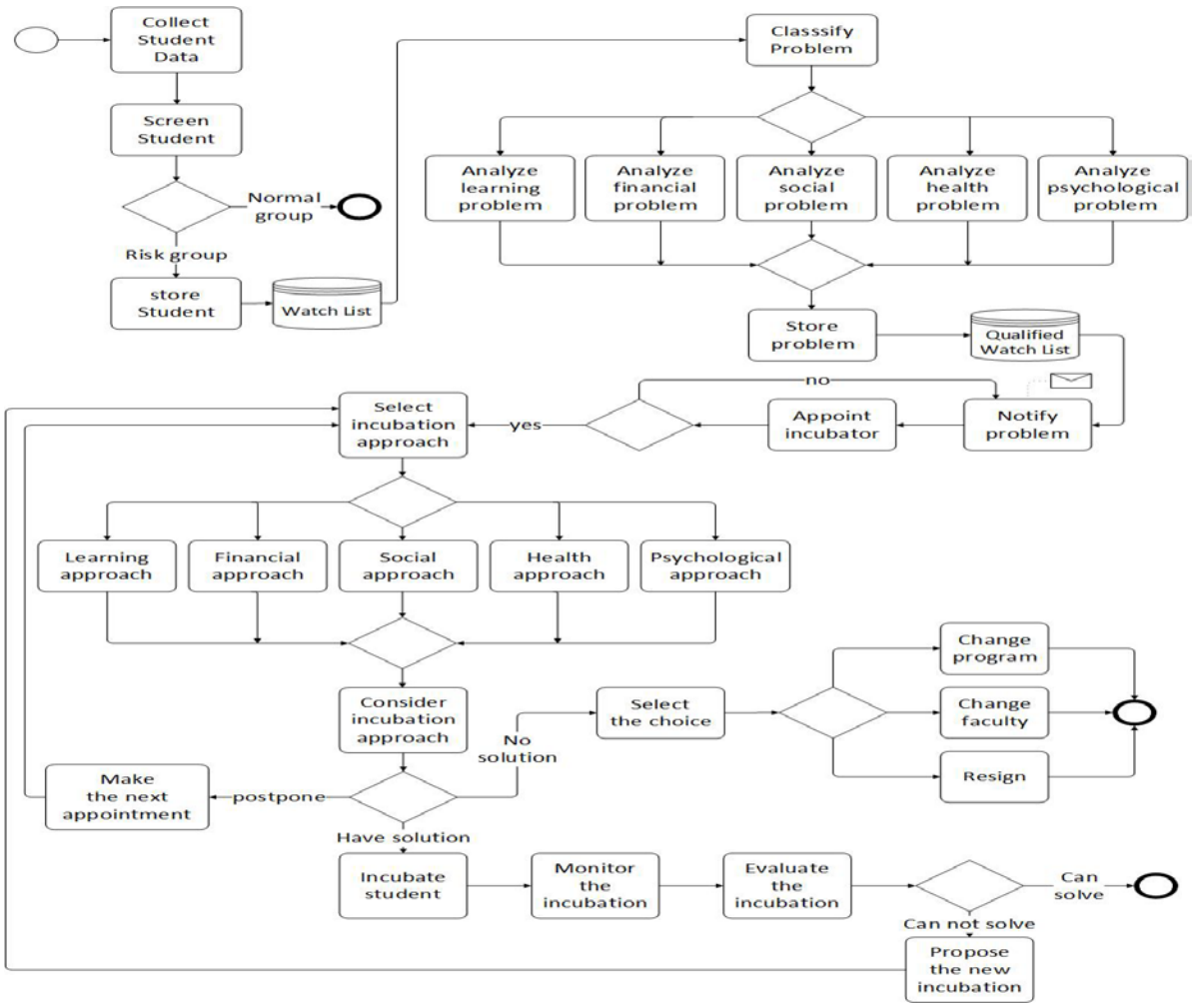

Figure 3. SSS WIS procedures

4.2 System Evaluation

Technology of acceptance (TAM) [13] is one of the widely used models to evaluate users how they accept to use the information system. To evaluate the SSS WIS system, TAM is applied to design the questionnaire for 30 samples which are the stake holder of the Rajabhat Lampang University. Referred to the theory of TAM, the questionnaire is designed to cover four main issues: 1) perceived usefulness 2) perceived ease of use 3) attitude toward using and 4) behavioral intention to use. To assess user satisfaction, five levels of Likert scale [14] are employed to scale user responsiveness. The regularly used five levels of Likert scale measurement in this paper is applied by Best [15] as the following:

4.50 – 5.00 Very satisfied
3.50 – 4.49 Satisfied
2.50 – 3.49 Neither satisfied nor dissatisfied
1.50 – 2.49 Dissatisfied
1.00 – 1.49 Very dissatisfied.

The assessment is shown in Table 1.

Table 1. The evaluation of satisfaction in SSS WIS system.

Evaluation Issues	Mean	Standard deviation
Perceived usefulness (PU)	4.75	0.69
Perceived ease of use (PEOU)	4.60	0.59
Attitude toward using (A)	4.52	0.66
Behavioral intention to use (BI)	4.54	0.48
average of satisfaction	**4.60**	**0.65**

The evaluation of satisfaction in SSS WIS system in Table 1. shows that the average of satisfaction level of SSS WIS system is very satisfied with the mean 4.60 out of 5.0. All issues display the average of satisfaction level is very satisfied with the mean over 4.50 referring to the measurement of Best[15]. These results denote that the SSS WIS system can highly help to graduate from university.

5. Conclusion

The student support service (SSS) is not only integrating the workflow of multiple departments but also creating the new ways for student troubleshooting. This system can assist students to graduate from the university on time. The SSS WIS starts by tracking student since entrance at the university. Student data are individually analyzed from the information of student application, instructors, grade point average and social media. The student watch lists for incubation are created by the analyzed data. The problems of non-graduates are divided into five dimensions: study, financial, social, health and psychological. These dimensions are employed to categorize the incubation method for all problems. After the student has been incubated under the guidelines, the SSS WIS system will monitor, notify and summarize the results of each student's evaluation in the watch list.

The SSS WIS system is evaluated by 30 samples of the Rajabhat Lampang university stakeholder. The evaluation is assessed following TAM theory. The satisfaction result shows that the average satisfaction level is 4.60 or 92 percent of acceptance rate. This is a confirmation that SSS WIS system can increase the retention rate and increase the opportunity of graduation for students. In the future, it can be developed into a system to support students from various backgrounds such as family, financial, educational and so on.

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