

THE DOCTORAL STUDENTS REGISTRATION SYSTEM (DSRS)

by Ms. Attipa Julpisit

A Final Report of the Three-Credits Course CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

March 2002

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Project Advisor Dr. Chamnong Jungthirapanich

Academic Year March 2002

The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

Approval Committee:

(Dr. Chamnong Jui t apanich)
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ABSTRACT

The university's main activities are to give education, services to students and to operate students' information better than other universities. New technology in computerized system can help the university to accomplish the goal.

This project designs and develops databases and programs for the university's activities in the doctoral program. The Doctoral Students Registration System (DSRS) is implemented under the System Development Life Cycle (SDLC). The dataflow diagram is implemented by using Gane and Sarson's method by the Power Designer version 6. The development tool is PowerBuilder version 7 and the database is Sybase on NT platfolLi. The DSRS application can be operated on Windows95/98/ME using LAN connection. This project can be implemented within 6 months of SDLC, starting from system planning to system operation and support. Security is controlled by authorization of username and password of users. The testing are unit testing, integration test, and system testing.

By using the DSRS, the university changed the operation from manual to computerized. This computerized information can make better service to the students and improve the university's operation.

ACKNOWLEDGEMENTS

I am indebted to the following people and organizations, without them, this project would not have been possible.

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Special appreciation is due to my family for their fervent and continuous encouragement. Above all, I am forever grateful to my parents whose willingness to invest in my future has enabled me to achieve my educational goal.

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I. INTRODUCTION

1.1 Background of the Project

The Doctoral Students Registration System's purpose (DSRS) is for use in Bangkok University's registration system for the doctoral program. At present, Records Office, Graduate School, Financial Affairs of Bangkok University, which is in charge of doctoral registration procedures, process the registration of doctoral program manually from the first day of registration till graduation. Students have to fill out all necessary forms and submit it to the specified department. They have to collect all documents in the registration procedure and keep them instead of computer infounation in the form of databases.

The DSRS will replace the manual process of student's registration after they passed the entrance examination of the Graduate School of Bangkok University. Those processes are registration, course withdrawal, classifying student's status, grading system, curriculum, fees and tuition, and course schedule for the registration.

The Doctoral Students Registration System (DSRS) has 7 main processes.

- (1) Curriculum Management

 Managing curriculum of the doctoral program.
- Course Schedule Management
 Managing course schedule.
- (3) Fee ManagementManaging fees and tuition in registration process.
- (4) Registration and Registration Payment Process
 When students want to register, add, or drop their courses in each semester,
 and do the registration payment.

(5) Course Withdrawal Process

To withdraw the courses after the end of the midterm examination.

(6) Student Status Process

Classifying student's status at the end of each regular semester.

(7) Grading System

Managing student's course results.

1.2 Objectives of the Project

The DSRS should be improved in the efficiency of working of staffs and to reduce time that is used in each process. When the system is in operation, the information of the doctoral students will be organized and instructors, students, and Bangkok University's officers can use it for the benefits of the university.

The following are the main objective of the DSRS:

- (1) Using infoil_iation technology to achieve organization's goals.
- (2) Using infoimation technology to produce effective output.
- (3),, Using information technology to help the organization process.

1.3 Scope of the Project

The scopes of the DSRS are the following:

- (1) Design and develop databases for Doctoral Program.
- (2) Design and develop programs for different processes of the doctoral program.

II. THE EXISTING SYSTEM

2.1 Background of Bangkok University and the Doctoral Program

Bangkok University was officially founded in Bangkok on December 25, 1962. The University was originally know as the Thai Polytechnic Institute, but in 1965 it was recognized as Bangkok College. On October 24, 1984, the College was granted University status by the Ministry of University Affairs.

Bangkok University is a private, non-profit, co-education institution under the patronage of the Bangkok University Foundation. The University offers courses in Thai leading to a Bachelor's Degree in Business Administration, Accounting, Communication Arts, Humanities, Law, Economics, Science, Fine and Applied Arts, and Engineering. In addition, the University offers full programs of study in the School of Business Administration, Accounting, Communication Arts and Humanities in which English is the language of instruction.

The University has two campuses. The city campus is in Bangkok. The Address is 40/4 Rama IV Road, Klong Toey, Bangkok 10110. The Rangsit campus is located in Pathum Thani. The address is 9/1 Moo 5 Phaholyothin Road, Tambon Khlong Nueng, Amphoe Khlong Luang, Pathum Thani 12120.

In 1994, the Doctoral Program in Interpersonal Communication (International Program) was launched in cooperation with the School of Interpersonal Communication, Ohio University. The Doctoral Program in Business Administration was introduced in 1999. The program will be offered by Bangkok University in cooperation with the University of Nebraska-Lincoln, U.S.A.

The doctoral program's students in Interpersonal Communication will spend their first year at Bangkok University, then transfer to study at Ohio University for two

semesters. They will spend their third year of study in preparation for their qualifying examination and dissertation at Bangkok University.

The doctoral program's students in Business Administration will spend their first year at Bangkok University, then go to the University of Nebraska-Lincoln for two semesters and one summer, where they will complete their Qualifying Examination before returning to Bangkok University to complete their dissertation work.

The academic system shall be divided into two regular semesters: first and second semesters, with a duration of 16 weeks for each semester. A summer session will be conducted following the second semester, with a minimum of a 9-week duration. Both programs require a maximum of five years.

The doctoral program requires a minimum of 36 credits of coursework, and a minimum of 36 dissertation credits.

2.2 Existing Business Functions

The manual process of registration since the first day of the doctoral program are the declaration of fees and tuition, curriculum, course schedule, and the registration procedure including add and drop courses, withdrawing period after mid-term examination, the result of courses after final examination, and classifying student's status. The following are the procedure of each process.

(1) Curriculum

The Graduate School set the curriculum of each program when the University started the new program.

(2) Fees and Tuition

Financial Affairs sets tuition, surcharge, and other fees of each semester according to the University's announcement.

The following are list of fees and tuition:

- (a) The tuition fee
- (b) The tuition fee for fundamental courses (per course)
- (c) The dissertation fee (per credit)
- (d) Other fees per semester are general education surcharge, library service, health center service, extra-curricular activities, graduate student union, graduate student status maintenance (if applicable), laboratory (per course -if applicable).
- (e) Other special fees are comprehensive examination, summer session, admission, registration for graduate student status, graduation, student identification card, transcript, other credential (each), damage deposit, accident insurance, orientation, computer internet fee (per semester).

Students are required to pay the tuition and fees at the other university's rate during their stay in U.S.A. Students are required to write three checks of equal payments payable to Bangkok University before leaving for U.S.A. These checks should be post-dated on August 1, December 1, and March 1.

There are other expenses estimated as follows: airfares, books, housing, personal. The costs stated above may vary and fall under the student's responsibility.

There are refund policies for the damage deposit, enrollment, and withdrawal. The damage deposit will be refunded to the student upon graduation, provided that the student claims the refund within one academic year after graduation. The University reserves the right to deduct the damage deposit to meet the costs of repairing damage incurred to University property caused be the student.

A student enrolled in a course subsequently cancelled by the University will receive the full refund of tuition fees.

A student enrolled not for his/her first semester is entitled to 40% refund of tuition fees when dropping a course. Tuition fees paid for the student's first semester are not refundable.

A student who withdraws a course is not entitled to a refund of tuition fee. Other fees as set out above will not be refunded.

(3) Course Schedule Management

The Graduate School sets course schedules of each program. Course schedule is courses which open for the doctoral student to register in each semester. The students have to register in the courses that Graduate School arranges in each semester before the start of that semester.

(4) Registration

The registration step of manual procedures are:

- (a) Students get the registration materials from Graduate School Office and filling in the registration folins.
- (b) Obtain approval signatures from the advisor.
- (c) Pay tuition and fees and get a receipt from Financial Affairs.
- (d) Present the RGS 101 form and the receipt to the Records Office staff for the final record with signature.
 - Registration Regulations are the following:
- (a) The University will arrange for the registration for each semester before the start of that semester.
- (b) Should any course be canceled by the University or a limitation be placed on the number of students allowed to register for a particular

- course, the University will make an announcement within the first 7 days of the semester or within the first 3 days of a summer session. In the event of such a cancellation or limitation, any affected student will be permitted to register for an alternative course.
- (c) A student must register for a minimum of six credits but not over fifteen credits in each semester. To qualify for registration for 15 credits, a student must obtain a cumulative G.P.A. of 3.25 or higher. Students with a cumulative G.P.A. of 3.00 3.24 must obtain approval from the Dean of the Graduate School. In the summer session, a student cannot register for more than six credits.
- (d) The registration for less than the minimum number of credits for registration as specified in these regulations is granted to a student only if he/she is in his/her last semester of studies or in any circumstances deemed proper by the University and with the approval from the Dean of the Graduate School.
- ,, (e) The enrollment for the maximum number of credit hours (15 credits) as specified above includes the credit hours earned for preliminary courses.
 - (f) Any registration credits whose number is lower than the minimum number required for regular semesters (6 credits) as specified above will be null and void. Any registration credits over the maximum limit of 15 credits for regular semesters will be null and void.
 - (g) Prior to registration, a student must obtain approval from an advisor who will sign their registration foul'. Students must take courses which are prerequisites to regular courses, if any.

- (h) The student should register in person at the specified date, time and place, along with payment of tuition and other fees as required by the University. Otherwise, the student must authorize his or her representative to register on his/her behalf. In no circumstances will the University allow registration after the registration period specified.
- (i) The student who registers on dates specified for late registration must pay late registration fees.
- (j) Students are allowed to audit a course after receiving prior advice and approval from the advisor. He/she must pay tuition and other fees as required by the University, and will receive "AUD' (AUDIT) in his/her grade report
- (k) Students completing coursework but having obtained a cumulative G.P.A. lower than 3.00 are allowed to retake courses in which they obtained a grade lower than "B" or take new courses in their curriculum which they had not previously registered for. The total number of credits they are allowed to register to upgrade their cumulative G.P.A. should not exceed 54 credits.

(5) Course Withdrawal

The withdrawal steps are the following:

- (a) Students get the Withdraw Card from Records Office and filling in the faun.
- (b) Obtain approval signatures from the advisor.
- (c) Submit the Withdraw Card to Records Office.

Withdrawal Regulations, Withdrawal of courses will be allowed only three weeks after the midteiin examination for the regular semesters, or the first week after the end of the midterm examination of the summer session.

The letter grade "W" will be recorded on the student's transcript.

Withdrawal of courses after the specified period may be allowed with approval from the Dean of the Graduate school. In this case, a student must secure approval from the Dean. The letter grade "W" will be recorded on the student's transcript.

(6) Grading System

The Graduate School will be the center for receiving the result of course from instructor and sent to Records Office to be kept in a student's file.

(7) Student's Status Process

Students will be classified status at the end of each regular semester by Records Office. Students in good standing are those who obtain a cumulative grade point average of 3.00 and higher. Students who obtain a cumulative grade point average lower than 3.00 but higher than 2.50 will be classified as "on probation." A student loses graduate student status if he/she:

- (a) receives a cumulative grade point average lower than 2.50 at the end of any regular semester;
- (b) is on probation and receives a cumulative grade point average lower than 3.00 for another two consecutive semesters;
- (c) fails the qualifying examinations;
- (d) completes the degree;
- (e) is deceased;
- (f) resign from the University;

- (g) take a leave of absence for more than two consecutive regular semesters;
- (h) is dismissed from the University.



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III. THE PROPOSED SYSTEM

3.1 System Specification

(1) Curriculum

Graduate School can add, edit and delete the curriculum of each program, core courses, elective courses, total credit to the database and print report.

(2) Course Schedule Management

Graduate School can add, edit and delete course schedule and print report.

(3) Fees and Tuition

Financials Affair Office can add, edit and delete tuition and fee of each program to the database and print report.

(4) Registration and Registration Payment

Records Office can add, edit and delete the courses that students register in each semester. Financial Affairs office inputs the registration payment and prints the receipt.

(5) Course Withdrawal

Records Office can add, edit and delete courses that students withdraw and print report.

(6) Student's Status Process

Records Office processes student status at the first and second semester of each year and inputs data when students resign.

(7) Grading System

Records Office can add, edit and delete the result of course of each student and print report.

3.2 System Design

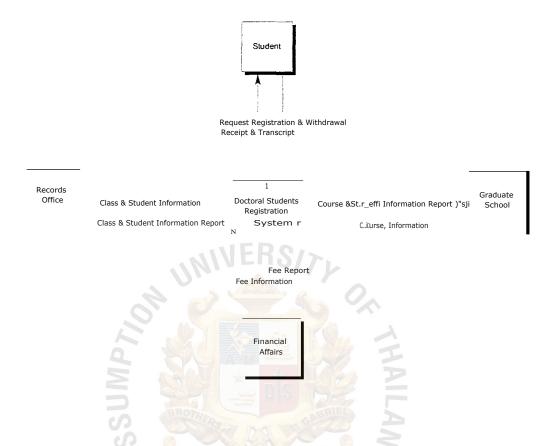


Figure 3.1. The Main Context Diagram for the Doctoral Students Registration System.



3.2.1 The Main Context Diagram

The main context diagram for the Doctoral Students Registration System in Figure 3.1 has 4 main entities. There are Student, Records Office, Financial Affairs and Graduate School. Student activities are requesting for registration and getting receipt, withdrawing courses and transcript. Records Office processes registration, grade and student's status. Financial Affairs manages fee and tuition of registration. Graduate School manages curriculum of Doctoral Program.

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3.2.2 Data Flow Diagram Level 0

In DSRS, there are 7 major processes illustrated in Figure 3.2.

Process 1: Curriculum Management Process

The Curriculum Management Process is to arrange curriculum: courses and total credits of each doctoral program which students have to complete all courses in order to graduate. Graduate School does this process. Graduate School provides courses, which are core courses, elective courses, total credits of each group, and total credits of all courses.

To maintain the information, this process has to add a new curriculum when the university launches a new doctoral program, edit or change existing information and delete unused information in Curriculum table.

The outputs of this process are curriculum infoiniation in Curriculum table and bulletin for students which guide them to register in each semester.

Process 2: Course Schedule Management Process

The Course Schedule Management Process is to provide courses and schedules that doctoral students will choose to register in each semester. Graduate School does this process.

This process is to add new courses and schedule information: course, section, time into Course Schedule table. To edit existing information and delete unused information.

The output are registration manual for students which provide important information for registration and Course Schedule table.

Process 3: Fee Management Process

Fees and tuition in registration is one of important informations which is managed by Financial Affairs. There are tuition and fees: Library Service, Health Center Service, Extra-Curricular Activities, Graduate Student Union, Laboratory, Comprehensive Examination, Summer Session, Accident Insurance, Computer Internet fee etc.

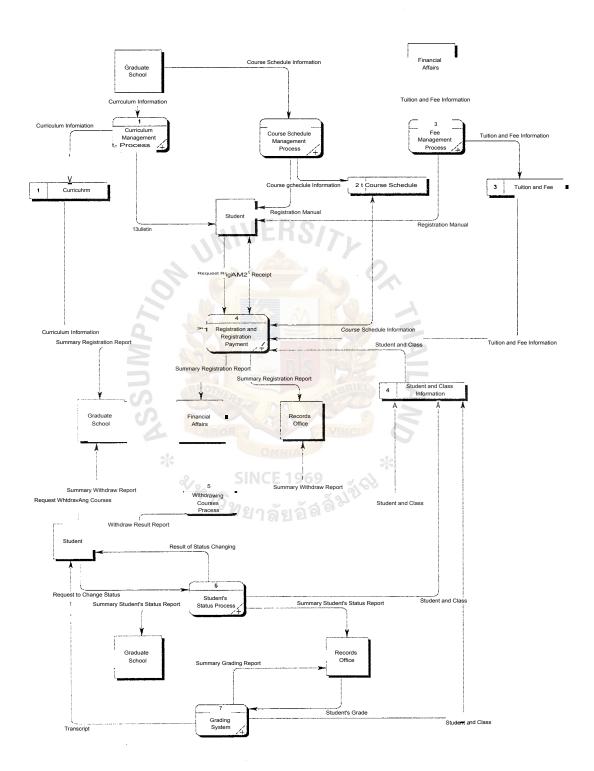


Figure 3.2. Data Flow Diagram (Level 0) for the Doctoral Students Registration System.

To maintain fee information, this process has to add new fee, edit or delete existing information in Tuition and Fee table. The outputs of this process are tuition and fee information, and financial part in registration manual.

Process 4: Registration and Registration Payment

The Registration and Registration Payment process is started with the student requests to register the courses that is opened in each semester at Records Office with the approval of the advisor from Graduate School. The tuition and fee paying can be made at the bank by using the slip from Records Office or by check at Financial Affairs. The registration will be completed only when the Financial Affairs get the payment infoiination. The slip can change to receipt if payment is completed with signature of bank officer or financial officer without re-print.

The infoimation in this process comes from other fundamental information, such as Curriculum, Course Schedule, Tuition and Fee table, to produce class infoil_iation in Student and Class table.

The output of this process are the receipt from registration and student list in each Process 5: Withdrawing Courses course if the payment is completed. (E 1969)

Students can request to withdraw from any course at the Records Office with the approval of the advisor from Graduate School. The letter grade W will be recorded on the student's transcript.

To maintain withdrawal of courses, Records Office has to edit and change grade of each course to W in Student and Class table and print report of withdrawal courses and student list.

Process 6: Student's Status Process

In each regular semester Records Office will process student status. There are two types of process. First, students request to change status: resign, take a leave of absence, complete the degree. Another is processing from their grade: a cumulative grade point average lower than 3.00 but higher than 2.50 will be on probation, or dismissed if a cumulative grade point average is lower than 2.50.

Record Office will maintain this process by editing and changing student's status in Student and Class table and print the report.

Process 7: Grading System

This process is to maintain students' grade. Records Office inputs grade to Student and Class table both for Bangkok University's courses and jointed courses with Ohio University for Doctoral Program in Interpersonal Communication and University of Nebraska-Lincoln for Doctoral Program in Business Administration. The grade point average can be calculated with this process. There are two types of reports, grade summary with GPA. for Records Office for checking accuracy and transcript for 3.2.3 Data Flow Diagram Level 1 students.

Main processes in the data flow diagram level 0 is divided into processes in data flow diagram level 1.

Process 1 The Curriculum Management Process has 1 sub-process.

Process 1.1 Maintain Degree Requirement and List of Courses. (Figure 3.3)

This process maintains the infounation by adding, editing, and deleting list of courses and the requirement of degree such as total credit, total credit of each group, courses which the student has to complete before graduation. The process can generate

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the report of this information to produce bulletin for the student and other reports for the user.

Process 2 The Course Schedule Management Process.

Process 2.1 Maintain Course Schedule. (Figure 3.4)

This process maintains the information by adding, editing, and deleting courses which are open for doctoral student each semester. There are courses and sections, day and time of courses, numbers of student in each section. The process can generate the report of this information to produce registration manual for the student and other reports for the user.

Process 3 The Fee Management Process.

Process 3.1 Maintain Tuition and Fee Information. (Figure 3.5)

This process maintains the information by adding, editing, and deleting fee and tuition for registration of doctoral student in each semester. There are all fees which cover every kind of registration of doctoral students, tuition fees, dissertation fees, library services, health center services, graduate student union, laboratory, computer interne fee, comprehensive examination, summer session, graduation, student identification card, damage deposit, accident insurance etc. The process can generate the report of this information to produce registration manual for the student and other reports for the user.

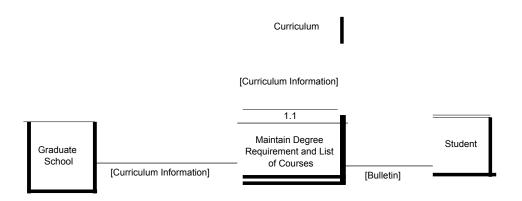


Figure 3.3. Data Flow Diagram (Level 1) for the Curriculum Management Process.

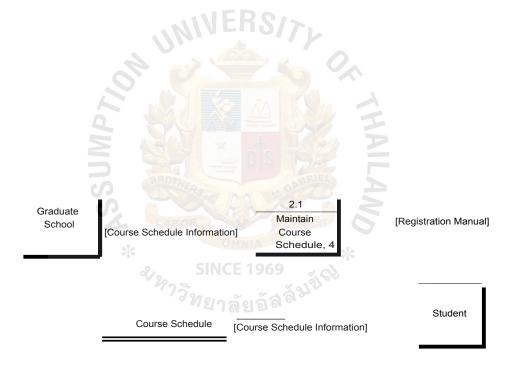


Figure 3.4. Data Flow Diagram (Level 1) for the Course Schedule Management Process.

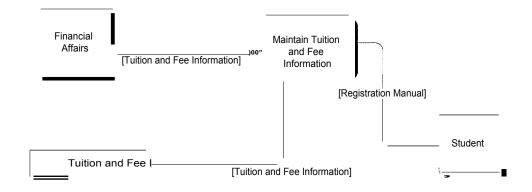


Figure 3.5. Data Flow Diagram (Level 1) for the Fee Management Process.

Process 4 Registration and Registration Payment Process.

There are 2 sub-processes of registration; registration and registration payment (Figure 3.6).

Process 4.1 Registration Courses.

This process maintains the information by adding, editing, and deleting courses and section which students register in each semester. The process can generate the report of this infoimation to produce the slip for the student to do payment at the bank or by the bank's check at financial affairs and other reports for the user.

Process 4.2 Registration Payment.

This process maintains the information by complete the transaction of registration of students when the university gets money from the student which are bank's check or payment from the bank. If there are change or refund from the registration the university will give the change to student in cash. The process can generate the report of this information for the user.

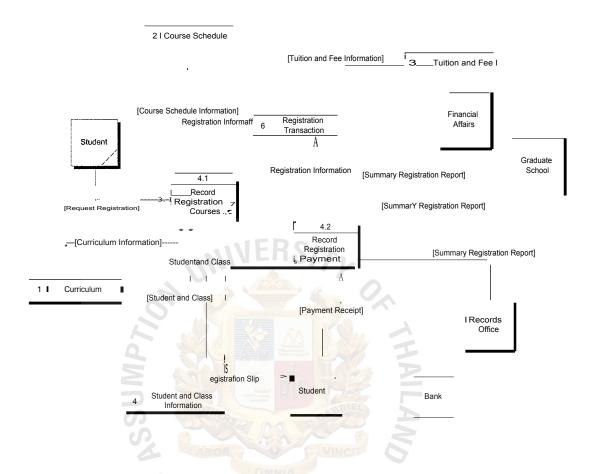


Figure 3.6. Data Flow Diagram (Level 1) for the Registration and Registration Payment Process.

Process 5 The Course Withdrawing Process.

Process 5.1 Maintain Withdrawing Courses (Figure 3.7).

This process maintains the infoimation by editing courses with grade W which students registered but do not study after the result of the midterm examination. The process can generate the report of this information to produce the slip for the student and other reports for the user.

Process 6 The Student Status Process

Process 6.1 Maintain Student's Status (Figure 3.8).

This process maintains the infounation by adding, editing, and deleting student's status both requested by student and the university regulation. The process can generate the report of this information for the user.

Process 7 The Grading System.

Process 7.1 Maintain Student's Grade (Figure 3.9).

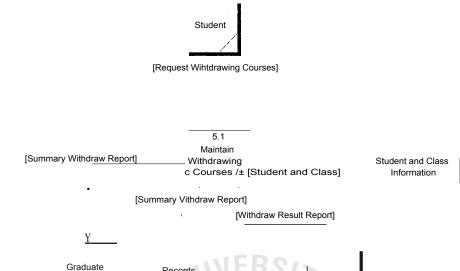
This process maintains the infoiniation by adding, editing, and deleting student's grade in each semester. This process will calculate cumulative grade point average before printing the transcript. The process can generate the report of this information to produce the transcript for the student and other reports for the user.

3.2.4 Data Flow Diagram Level 2

The processes in the data flow diagram level 1 is divided into process in data flow diagram level 2.

Process 1.1 Maintain Degree Requirement and List of Courses

There are 4 processes (Figure 3.10).



Records

Office

School

Figure 3.7. Data Flow Diagram (Level 1) for the Course Withdrawing Process.

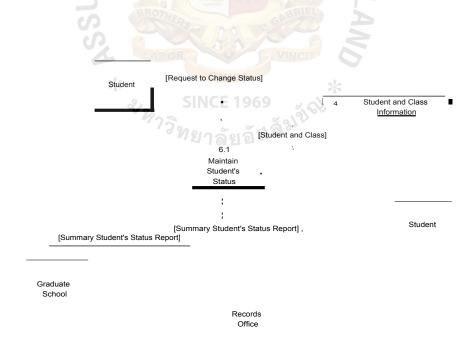


Figure 3.8. Data Flow Diagram (Level 1) for the Student's Status Process.

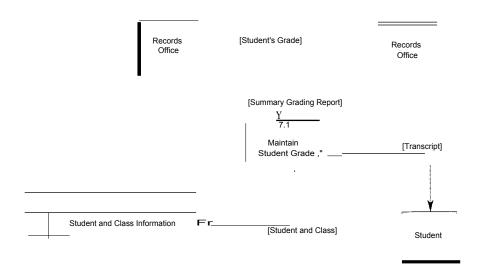


Figure 3.9. Data Flow Diagram (Level 1) for the Grading System.

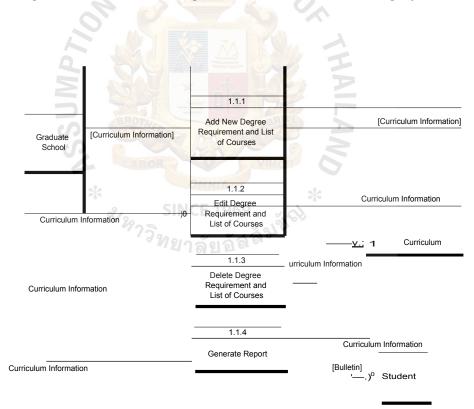


Figure 3.10. Data Flow Diagram (Level 2) for the Curriculum Management Process.

P1.1.1 Add New Degree Requirement and List of Courses

This process adds new degree requirement of each school and list of courses. The user can insert new information of the doctoral program on academic year and school to the Curriculum table. The degree requirement are total credits of each general courses, core courses etc., and list of courses and credit which the doctoral students have to complete.

P1.1.2 Edit Degree Requirement and List of Courses

This process edits the existing information by using academic year and school to identify the specific records. The users can edit records and save it back to the table.

P1.1.3 Delete Degree Requirement and List of Courses

This process deletes the existing information when errors occur or modifies the infounation. The user retrieves the record from the table, and delete. The record will be removed from the table.

P1.1.4 Generate Report

This process generates report which are bulletin and especially the reports for the user.

Process 2.1 Maintain Course Schedule

There are 4 processes (Figure 3.11).

P2.1.1 Add Course Schedule

This process adds new courses and sections for registration to the Course Schedule table. The Graduate School provides courses and sections and enters this information to the system.

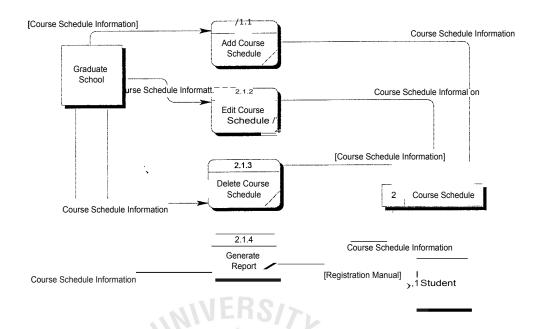


Figure 3.11. Data Flow Diagram (Level 2) for the Course Schedule Management Process.

P2.1.2 Edit Course Schedule

This process edits or changes the existing infoimation by identifying the course and section. The users can edit records and save it back to the table.

P2.1.3 Delete Course Schedule

This process deletes the existing infoitnation when errors occur or the courses are no longer used. The user retrieves the record from the table, and delete. The record will be removed from the table.

P2.1.4 Generate Report

This process generates report which are registration manual and especially the reports for the user.

Process 3.1 Maintain Tuition and Fee Information

There are 4 processes (Figure 3.12).

P3.1.1 Add New Fee

This process adds new fees for registration to the Tuition and Fee table. The Financial Affairs provides tuition and fees and enters this infoiiiiation to the system on each academic year and school.

P3.1.2 Edit Fee

This process edits or changes the existing information by identifying the academic year, school and fee. The users can edit records and save it back to the table.

P3.1.3 Delete Fee

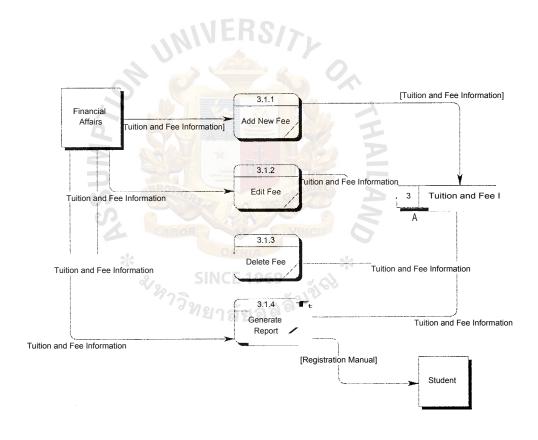


Figure 3.12. Data Flow Diagram (Level 2) for the Fee Management Process.

This process deletes the existing information when errors occur or the fees are no longer used. The user retrieves the record from the table, and delete. The record will be removed from the table.

P3.1.4 Generate Report

This process generates report which are registration manual and the special reports for the user.

Process 4.1 Record Registration Courses

There are 3 processes (Figure 3.13).

P4.1.1 Add New Course

This process adds new transactions of registration to the Registration Transaction table. The doctoral students request registration by filling out the registration foim. The Records Office enters the registration infolination to the system by using student ID. to identify the students and add courses. The system will print the registration slip for the students to complete the registration transaction by payment at Financial Affairs or Bank.

P4.1.2 Edit Course

This process edits or changes the existing infolmation for adding or dropping courses by identifying the student ID. and courses. The users can edit records and save it back to the table. The system will print the registration slip for the students to complete the registration transaction by payment at Financial Affairs or Bank.

P4.1.3 Generate Report

This process generates reports which are registration slips for each student and the special reports for the user.

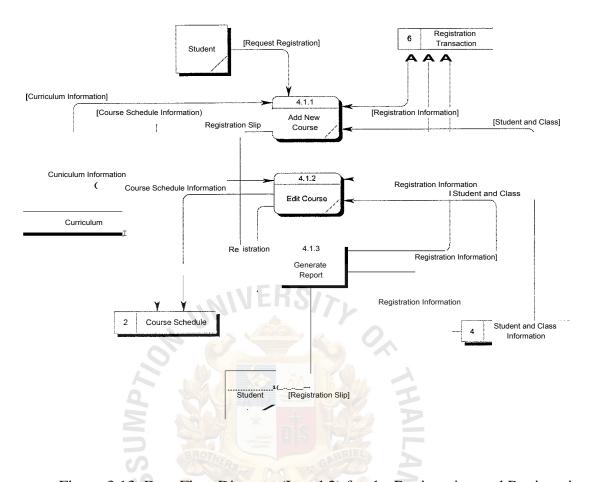


Figure 3.13. Data Flow Diagram (Level 2) for the Registration and Registration Payment Process.

Process 4.2 Record Registration Payment

There are 2 processes (Figure 3.14).

P4.2.1 Record Registration Payment

After the students registered at the Records Office, they paid the registration payment at the Bank or Financial Affairs. If the payment was made at Financial Affairs by cheque, the registration transaction was completed and registered courses information was saved to Student and Class table. If the payment was made at counter payment at the bank, Financial Affairs has to download data from the bank and save the information to Student and Class table too.

P4.2.2 Generate Report

This process generates the special reports for the user.

Process 5.1 Maintain Withdrawing Course

There are 2 processes (Figure 3.15).

P5.1.1 Withdraw Course

After the midterm examination, the students can withdraw from courses at Records Office by filling out the withdrawal form. Records Office withdraw the courses by identifying student ID. and course. The system will be recorded grade with 'W' in Student and Class table. The students will receive the withdrawal report to show the withdrawal courses and the remainder of registered courses.

P5.1.2 Generate Report

This process generates the special reports for the user.

Process 6.1 Maintain Student's Status

There are 3 processes (Figure 3.16).

P6.1.1 Edit Student's Status

Students can request to change status from good standing to resign, or leave by filling out the request form at Graduate School for approval by Dean of Graduate School and the students take the foiiii to Records Office to record the student's status. The Records Office will record the infoiniation by identifying student ID. The system will record the status to Student and Class table.

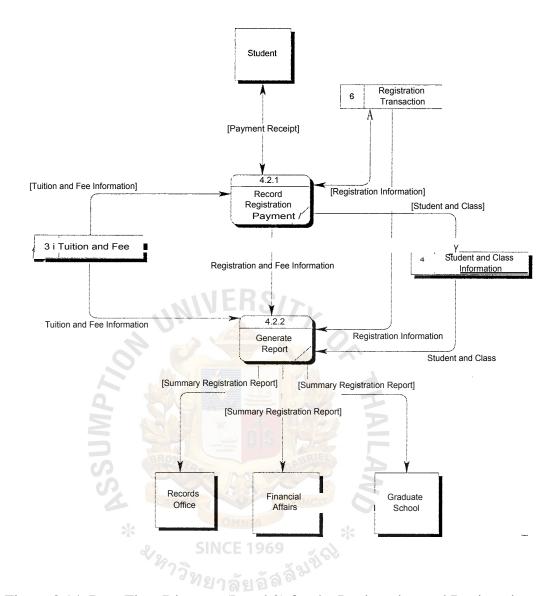


Figure 3.14. Data Flow Diagram (Level 2) for the Registration and Registration Payment Process.

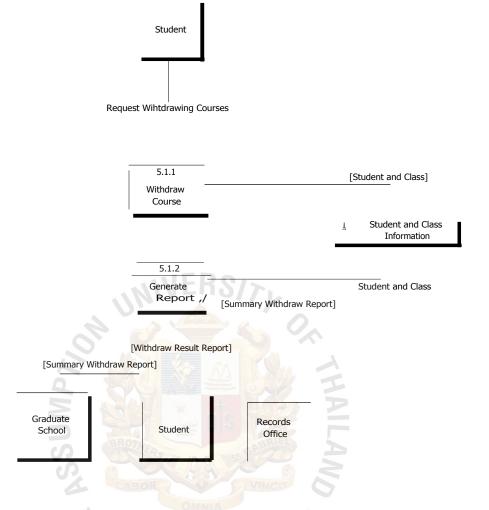


Figure 3.15. Data Flow Diagram (Level 2) for the Course Withdrawing Process.

P6.1.2 Generate Student's Status

Records Office will generate student's status at the end of each regular semester. There are on probation, retired, failure to register for courses without the request for leave of absence etc. The system will save the changing of information to Student and Class table.

P6.1.3 Generate Report

This process generates the university announcement report and the special reports for the user.

Process 7.1 Grading System

There are 6 processes (Figure 3.17).

P7.1.1 Enter Grade

This process adds new grade to the Student and Class table. The Records Office enters grade into the system on each student ID., academic year, semester and course.

P7.1.2 Edit Grade

This process edits or changes grade by identifying the student 1D., academic year, semester and course at both Student and Class table and Transcript table. The users can edit records and save it back to the table.

P7.1.3 Delete Grade

This process deletes the existing information when errors occur or the courses are no longer used. The user retrieves the record from the table, and delete. The record will be removed from the table.

P7.1.4 Transfer Class information to Transcript

This process will transfer course from Student and Class table to Transcript table only the courses that show in transcript and calculate cumulative credits and cumulative GPA.

P7.1.5 Enter Grade from Other University

The doctoral students have some courses that are studied at the university in USA. in which the grades will show in transcript of Bangkok University to complete the degree. This process will enter grade from those universities into Transcript table by Records Office.

St. Gabriel's Library, Au

P7.1.6 Generate Report

This process generates report which are transcript and the special reports for the user.

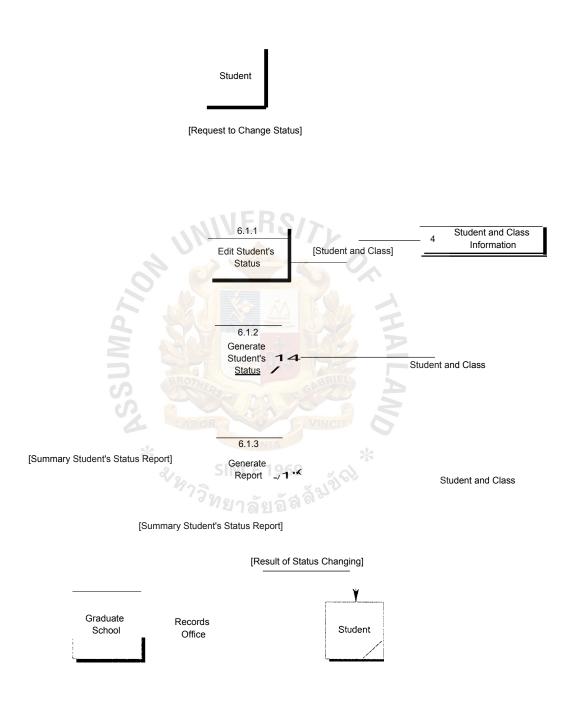


Figure 3.16. Data Flow Diagram (Level 2) for the Student's Status Process.

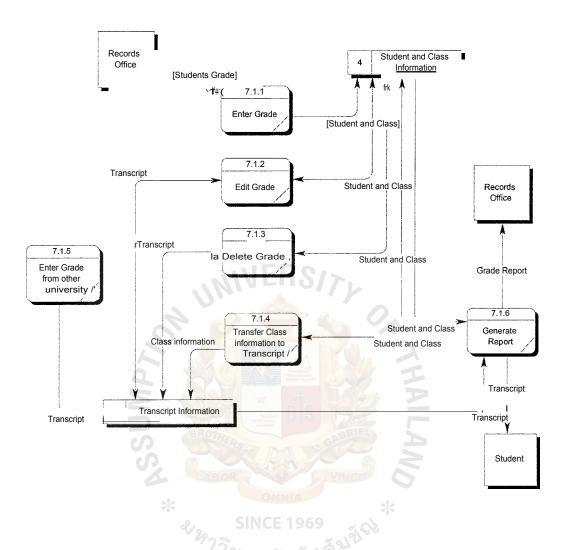


Figure 3.17. Data Flow Diagram (Level 2) for the Grading System.

3.2.5 The Entity-Relationship Diagram of the Proposed System

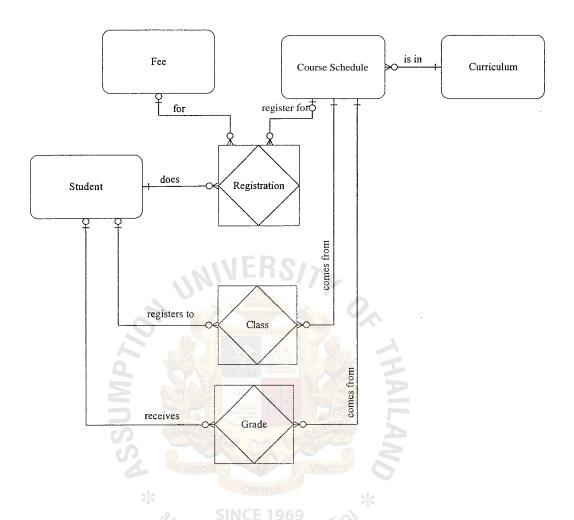


Figure 3.18. The Entity-Relationship of the DSRS.

The entity relationship diagram (ERD) is a graphic model of the information system that shows the relationship among system entities. The ERD depicts the big picture, capturing the organization and its constituent activities. The diagram is used to identify the required data of the system. There are entity and relationship in the diagram. Entities, are represented as rectangles, define something about the business and keeps information. An entity can be a person, object, concept, or event which the application maintains information. Relationship is the next step to define which describes entity associations.

The ERD of the DSRS is illustrated in Figure 3.18. There are 7 entities, Student, Curriculum, Fee, Course Schedule, Class, Registration, and Grade. The most important entity is Student, who registers courses, from Course Schedule, which gives Registration entity. Course Schedule has a relationship with Curriculum, which course schedule comes from curriculum. Student, Class, and Course Schedule, after registration, there is class which contains student and registered course from course schedule. Relationship between Student, Grade, and Course Schedule, each registered course will have grade of each student in each semester.

3.2.6 Input Design

The main objective of input design is to design a user-friendly interface and processes that ensure the quality, accuracy, and timeliness of system input. The design that can reduce input volume; reduce the number and size of input data items for each transaction, will help reduce labor costs and input errors. The inaccurate input leads to inaccurate output. The well-designed screen layouts help reduce errors.

Guidelines help reduce input volume are the following:

- (1) Input necessary data only. E 1969
- (2) Do not input data that can be calculated from other data.
- (3) Do not input constant data.
- (4) Use codes instead of the data.

The DSRS input design starts from the forms of manual operation and adjust those forms for the screen layout design. The design process are design data entry and input procedures. The first input comes from degree plan for the students. The degree plan is the courses that the doctoral students have to study. This information will be patterned for the course schedule and the registration. The next data are fee and course schedule. The important input design of this proposed system is the registration. It uses

the data from other processes and produces the transaction for the other procedures. The input design of the DSRS is in Appendix A.

3.2.7 Output Design

The output from the system supports business objectives and satisfies users

requirements, that makes the designing of printed report, screen output, and other

system outputs very important. The system outputs provide users with the information

they need to perform their jobs. The output design should have the following lists:

purpose of the output, who wants information, why it's needed, how it will be used,

what format is used. The output of the system must be correct and complete.

The output design of the DSRS is reports and some user's screen layout illustrated

in Appendix A. There are specific purpose reports such as report for registration

manual, registration slip, transcript. The other types of reports are summary report for

users to check infoiniation from each process.

3.3 Hardware and Software Requirement

The DSRS has to connect each workstation and the server together by using LAN.

The users from all departments share the information. The hardware and software

requirements are the following:

(1) Software

(a)

Database: SYBASE System XI NT Platfoilli

(b)

Developing Tool: PowerBuilder7

Microsoft Windows 95/98/ME (c)

(d) The DSRS

(2) Hardware

(a) Application/Database Server:

Intel P4 1.5 GHz

37

RDRAM PC800 256MB

Hard Disk: 20 GB Ultra ATA/100 interface 7,200 RPM

1.44 MB 3.5" Floppy drive

CD-ROM 50X

Network Interface Card: Support 10/100 Mbps

Monitor: 15"

Keyboard: PS/2

Mouse: 2-Button Scroll Mouse PS/2

(b) PC Workstation:

Intel Celeron 800 MHz

SDRAM PC133 128MB

Hard Disk: 20 GB Ultra ATA/100 interface 7,200 RPM

1.44 MB 3.5" Floppy drive

CD-ROM: 50X Internal

Network Interface Card: Support 10/100 Mbps

Monitor: 15" SINCE 1969

Keyboard: PS/2

Mouse: 2-Button Scroll Mouse PS/2

(c) Network Peripherals:

(1) 24-port hub

Cabling system (2)

(d) Printers:

(1) HP 2200d

OKI ML381 Turbo 24-Pin Impact (2)

The system configuration of the proposed system, Figure 3.19, has to wire all hardware together for sharing equipment and data. There is an application/database server: NT server, hub for connection the client computer of each department to server, include sharing printer within the same department.

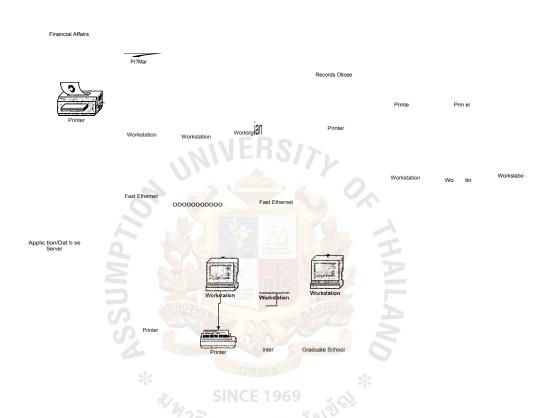


Figure 3.19. The System Configuration of the DSRS.

3.4 Security and Control

Security in DSRS is very important. Users who have authorized to access the data have to get priority. Not every user can access, insert, edit or delete every data. Priority must be arranged. There are 2 types of security to be concerned.

3.4.1 Physical Security

Physical security prevents computer system from disasters such as flood, fire, earthquake or theft etc. Computer system's room has to be controlled in temperature

and humidity. The room should be locked and people who can use the room must have permission. Fire prevention chemical substances are used especially to extinguish a fire and does not damage computer. The computers must have sufficient space to put them on including printer. Users should not be allowed to eat or drink near computers in office.

3.4.2 Logical Security

The users have to use login name and password to access the system. The system will authenticate that they have the rights to use the system or not. Login name and password are very important in identifying and authenticating people in the system. The users have to keep login name and password in secret place, do not write it and put it on the table or some easily accessed place. They have to change password frequently. The password should contain character, numbers and special characters and not the words in dictionary.

3.5 Cost and Benefit Analysis

3.5.1 Cost Analysis

Cost analysis of the DSRS is in the following table.

Table 3.1. The DSRS Cost Analysis, Baht.

Cost items	Year						
	0	1	2	3	4	5	
Fixed Cost							
Hardware Cost:							
Computer server Cost	31,000.00						
PC workstation Cost	54,000.00						
Network Cost	15,000.00						
Printer Cost	86,000.00						
Total Hardware Cost	186,000.00						
Software Cost	30,000.00						
Total Software Cost	30,000.00						
		WIFF	<125				
Total Fixed Cost	216,000.00	Minn	11/				
			900	0			
Operating Cost	0,						
Maintenance Cost	- 0		15,000.00	14,550.00	13,822.50	12,854.93	
Staff:	0						
Records Office 2 persons @8,000		y x	T UA				
/month	96,000.00	201,600.00	211,680.00	222,264.00	233,377.20	245,046.06	
Graduate School 2 persons @8,000	96,000.00	201,600.00	211,680.00	222,264.00	233,377.20	245,046.06	
Financial Affairs 2 persons @8,000	96,000.00	201,600.00	211,680.00	222,264.00	233,377.20	245,046.06	
		OMN	A				
Total Operating Cost	288,000.00	604,800.00	9650,040.00	681,342.00	713,954.10	— 747,993.11	
Total Implement Cost	504,000.00	วิทยาลัย	อัสลั้มขั้				

3.5.2 Benefits Analysis

There are tangible and intangible benefits to develop this project. Tangible benefits are benefits that we can assign a specific value such as reducing staff, decrease operating cost, decrease response time, eliminate production delay, increase revenue, reduce overtime. Intangible benefits are not directly measurable such as improved student service, increase student satisfaction, improve employee job satisfaction, eliminate repetitive clerical tasks.

Tangible Benefits

In manual registration, Records Office needs 4 staffs to handle the registration in each semester. Graduate School uses 3 staffs to set course schedule, and 2 staffs to organize the registration. Financial Affairs uses 2 staffs to set fees and 4 staffs in registration period. In the proposed DSRS system each department can do their job using only 2 staffs to prepare the registration and other jobs. The DSRS will decrease time in the other operations for instance withdrawing of courses, student's status changing, grading process, transcript, and summary reports. The tangible benefits of the DSRS that can be measured by the quantity and calculation are excessive staffs' annual salary 5 staffs, and estimation of reduction of human errors and better throughput.

Table 3.2. The DSRS Benefits Analysis, Baht.

				(III) 1 (1) (II)		
	Year					
Benefits	30 0	ROTHEL	2	3	4	5
Excessive staffs annual salary (5 staffs @8000	SA	ABOR	VI	8		
baht	240,000,00	504.000.00	520 200 00	555 60 00	502 442 00	c10 c15 15
each/month)	240,000.00	504,000.00	529,200.00	555,660.00	583,443.00	612,615.15
Reduction of	9/		E 1909	o', (C)		
human errors			~ 32	27		
(estimates)	20,000.00	54,000.00	72,900.00	98,415.00	132,860.25	142,160.47
Better			DE Z			
throughput						
(estimates)	30,000.00	96,000.00	153,600.00	245,760.00	393,216.00	420,741.12
Total Benefits	290,000.00	654,000.00	755,700.00	899,835.00	1,109,519.25	1,187,185.60

Intangible Benefits

Intangible benefits of the DSRS are the university will build up good image and impression in faster service to students, improve student satisfaction. The computerized system will provide better design of reports, faster generation and real-time report, real-time information, and more accurate information to students and instructors, support

decision making process. There are other intangible benefits to the departments which are reduced volume of paperwork, smooth and timely operations, less repetitive tasks, improve employee job satisfaction, expandability and flexibility for the user requirement.

3.5.3 Payback Analysis

The payback analysis is the process of determining how long it takes an information system pay for itself. The time it takes to recover the system's cost is called payback period.

Table 3.3. Five Years Accumulated Costs and Benefits, Baht.

		Accumulated	fa .	Accumulated
Year	Total Costs	Costs	Total Benefits	Benefits
0	504,000.00	504,000	290,000.00	290,000.00
1	604,800.00	1,108,800	654,000.00	944,000.00
2	650,040.00	1,758,840	755,700.00	1,699,700.00
3	681,342.00	2,440,182	899,835.00	2,599,535.00
4	713,954.10	3,154,136	1,109,519.25	3,709,054.25
5	747,993.11	3,902,129	1,187,185.60	4,896,239.85
	3,902,129.21	OMNIA	4,896,239.85	

The development of the DSRS takes 6 months, so there are some benefits in year 0. According to Figure 3.19, graph of accumulated costs and accumulated benefits, between year 2 and year 3, the accumulated costs and benefits are equal at some point. Thus the payback period of the DSRS is approximately between year 2 and 3.

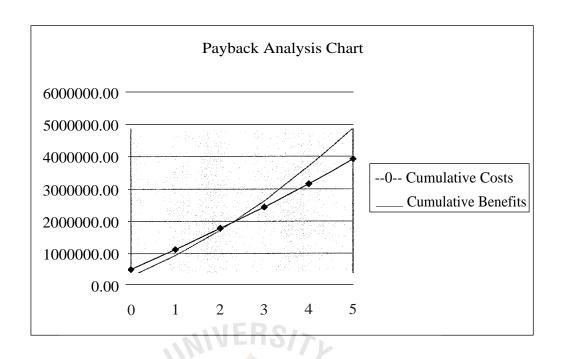


Figure 3.20. Payback Analysis Chart.

3.5.4 Return on Investment Analysis

Return on Investment Analysis (ROI) is a percentage rate that measures profitability by comparing the total net benefits received from a project to the total costs of the project. ROI is calculated from Table 3.3 as follows:

3.5.5 Present Value Analysis

Present value analysis adjusts the value of future costs and benefit costs to account for the time value of money. In this proposed system discount rate is 8% to calculate present value in Table 3.4.

Table 3.4. Present Value Analysis of the DSRS, Baht.

	Year					
	0	1	2	3	4	5
Benefits:	290,000.00	654,000.00	755,700.00	899,835.00	1,109,519.25	1,187,185.60
Present Value Factor (8%)	1.00	0.93	0.86	0.79	0.74	0.68
Present Value	290,000.00	605,604.00	647,634.90	714,468.99	815,496.65	808,473.39
Costs	504,000.00	604,800.00	650,040.00	681,342.00	713,954.10	747,993.11
Present Value Factor (8%)	1.00	0.93	0.86	0.79	0.74	0.68
Present Value	504,000.00	560,044.80	557,084.28	540,985.55	524,756.26	509,383.30

Net Present Value

Total Benefits Present Value - Total Costs Present Value

Total Benefits Present Value = 3,881,677.93

Total Costs Present Value = 3,297,254.20

Net Present Value = 3,881,677.93 - 3,196,254.20

= 685,423.73

From Table 3.4, the net present value of the DSRS is 685,423.73 baht, which is the total present value of benefits minus the total present value of costs. The net present value is a positive value, so this project will produce a larger return.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The overview of the proposed system implementation is illustrated by the Gantt chart, in Figure 4.1. The chart shows the beginning and the end of the proposed system development period.

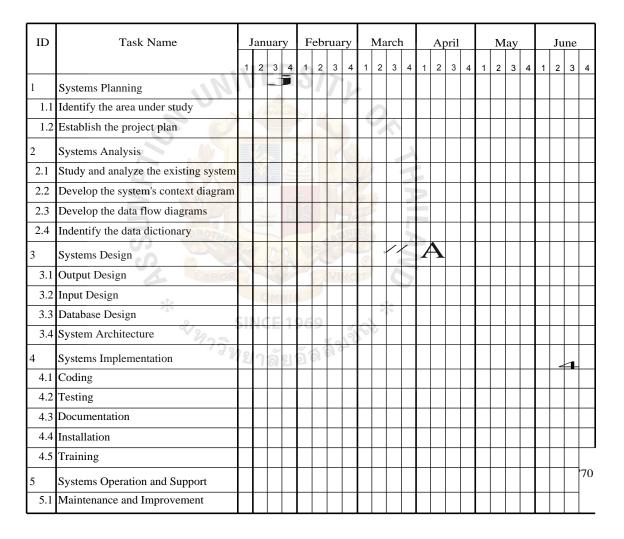


Figure 4.1. The Gantt Chart of the Proposed System of the DSRS.

The proposed system development is divided into 5 phases, systems planning, systems analysis, systems design, systems implementation, and systems operation and support.

Systems planning is the first step of SDLC. This step usually starts with a written request, called a systems request, that identifies the information system and describes the desired changes or improvement. The purpose of the planning phase is to identify clearly the nature and scope of the problem. This requires a preliminary investigation, which is a critical step, because the outcome will affect the entire development process.

The preliminary investigation often is called a feasibility study, based on economic, technical, and operational factors. This study is an initial determination, and the project's feasibility will be reviewed constantly during the SDLC. If management decides to proceed, the next step after the preliminary investigation is the systems analysis phase.

The purpose of the systems analysis is to learn exactly how the current registration system operates, to determine and document what the system should do, and to recommend alternative solutions. All functions are defined by the current information system and determine what improvements are needed, and develop a specific plan to solve the problems in the current system.

The first two phases of this proposed system, systems planning and systems analysis, require 9 weeks to be accomplished. At systems analysis phase, the system requirement document will describes all management and user requirements, alternative plans and costs, and recommendation.

The third phase is systems design. The purposes of this phase is to develop an information system design from all document requirements. During the systems design, a logical determination was determined, including all outputs, inputs, application

programs, and manual procedures. The design is documented in the system design specification and presented to management and users for their review and approval.

This proposed system requires 5 weeks in this phase to design all necessary information before processing to next phase, systems implementation.

Systems implementation requires 9 weeks. Application programs are written, tested, and documented; operational documentation and procedures are completed, and approval is obtained from users and management. At the end of this phase, the system is ready to use. The installation and training were perfolined. Users have to understand the process of the system. It will help them to understand their job well. Users should begin to operate the new system accompanied by the developer.

After delivery of the system, next phase is systems operation and support. Maintenance and enhancements are requested to resolve problems identified by users. Maintenance changes are made to correct errors or the business functions are changed. Enhancements are modifications that increase capability of the system for the users' convenience, such as improvement of specific programs, adding a new report or more information in existing report. This phase will operate for many years depending on business function.

4.2 Test Plan

Testing is important in the proposed system. After coding by following system design, testing is a process to certify that program and the system contain accurate and complete information about the functions they perform. In program coding, each program has to compile by using a language compiler. This process detects syntax errors, which are language grammar errors. The programmer corrects the errors until the program code can be executed properly.

There are 3 level testings used in the proposed system, unit testing, integration test, and system testing.

Unit tests verify that a specific program, module or routine fulfills its requirements as stated in related program and design specifications. The objective is to identify and eliminate execution errors. Test data should contain correct data and erroneous data. All conditions have to be conducted. The functions of each module such as adding, editing, and deleting infoil_iation have to work properly.

The DSRS uses SQL language, black-box testing at the unit level is also appropriate. White-box tests are most appropriate to testing the control logic. Therefore, a mix of black- and white-box testing will be done at the unit level.

The DSRS has 7 main processes to test in the unit test. Testing in each process can be separated. All functions have to be tested for adding, editing, deleting, and report generating. The users and the developers should create the test data and review the results together.

The top-down strategy for testing the application includes:

- (1) Test screen design and navigation, including validation of security and access control.
- (2) Test the call structure for all modules.
- (3) Test registration processing.
- (4) Test create processing for curriculum, course schedule, and fee.
- (5) Test remaining individual processes, withdrawing courses, student's status process, and grading.
- (6) Test multiple processes and file manipulations together, including validation of response time and peak system performance. The test will use many users doing the same and different processes, simultaneously.

(7) Test backup and recovery strategies.

Integration testing is to verify that groups of interacting modules that comprise and execute unit perform in a stable, predictable, and accurate manner that is consistent with all related programs and systems design specifications. Black-box, top-down testing is used for the integration testing. The test verifies first that all modules are called correctly. Data transfers between modules operate as intended within constraints of CPU time, memory, and response time. Data transfers tested include sorted and extracted data provided by utility programs, as well as data provided by other application modules. Integration tests interactions between modules only, not test logic paths within the modules.

The strategy for the unit testing are the following:

- (1) Define equivalent sets of processes and data inputs.
- (2) Define the priorities of equivalent sets for testing.
- (3) Develop test scripts for registration, curriculum, course schedule, withdrawing courses, student's status process, and grading system.
- (4) For each of the above scripts, the testing will proceed as follows:
 - (a) Test screen control, including security of access to the DSRS application.
 - (b) Evaluate accuracy of spelling, format, and consistency of each individual screen.
 - (c) Test access rights and screen access controls.
 - (d) Test information retrieval and display.
 - (e) For each transaction, test processing sequence, dialogue, error messages, and error processing.

(f) Review all reports and file contents for accuracy of processing, consistency, format, and spelling.

The system test is used to demonstrate an application's ability to operate satisfactorily in a simulated production environment using its intended hardware and software configuration. The system test, in addition, evaluates response time, audit, security, recovery, and multiuser processing. The system test is the final development test under the control of the project team. There are some parts of a process and uses information involving 2 or more departments. The test team should come from the staff of each department, management, and developer. The test design should include all possible legal and illegal transactions, enough volume to measure response time and peak transaction processing perfoimance. The step in developing system tests are the following:

- (1) List all actions, functions, and transactions to be tested.
- (2) Design transactions to test all actions, functions, and transactions.
- (3) Develop a single-user test script for above.
- (4) Interleave the tests across the users participating in the test to fully test multiuser functioning of the application.
- (5) Develop test scripts for each user.
- (6) Conduct the test.
- (7) Review test results and reconcile anomalous findings.

The system test is considered successful only when the entire system runs without error for all test types.

4.3 Conversion

Conversion in the DSRS is from totally manual to a totally automated application. There is no longer the manual process operation. The planning for conversion will follow the need of data.

From ER diagram, the needed data for starting the operation are Fee, Student, Curriculum, and Course Schedule. Registration, Class, and Grade are derived from processing.

The student information is converted from the old document file from excel file fomiat which has student number, name, status. Records Office will enter the other important data which is required to complete the student information. The fee will be entered by Financial Affairs. Graduate School will do curriculum and course schedule. Each department has to check the data after the conversion. The grade in processing step has to be keyed in to the database too. The old grade information is needed for transcript.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The DSRS which is part of student information will replace all manual processes of the doctoral program's registration and other processes of the doctoral student information; status and grade. Graduate School and Financial Affairs will be the first 2 departments of the registration process to input data; courses and fees, for the next step; registration. Records Office registers courses at students' request, registration payment can be made at bank or Financial Affair Office. Student's status will be updated. Grade reports can be printed from the computer. All departments can access the doctoral student information from everywhere in the university by using LAN.

The security control to access information is username and password. The rights to access or modify student information depend on their username and level in the department.

Paper using will be decrease because all information is stored in a computer.

Process time of each job will decrease, productivity will increase, information accuracy will be improved and updated.

The DSRS is developed by SDLC, the data flow diagrams (DFD) are developed from the context diagram to data flow level 3 to understand the system's process. The application software, PowerBuilder version 7 is used to develop as client. This software can provide form and report to meet user requirement. Database is Sybase on NT platform. Printing can be done on shared laser printer via the application server.

5.2 Recommendations

The proposed system is developed for the doctoral program. The university has other 2 degrees, bachelor and master's degree. This DSRS should be improved to

integrate both degrees. There could be different processes in details but the overview of the main procedure is similar.

The university should expand the system to cover other functions of the doctoral program such as grading system that the instructors can input student's score, print tally report, generate grade and transfer to the database without keying by the Records Office.

When the number of students increase, the computers and printers have to be increased for the staffs to handle the operation. The network infrastructure has to be improved and increase the equipment too. The database server and application server should be separated from each other. The utilization of the server would increase if the computer is more. The database server could be changed to unix operation system which is better security and reliable. The procedure of backup data and application should be arranged. The backup can be done every day, every week, and every month. Backup should have double set and keep separately.

The doctoral student's registration system could develop to internet registration for the students.

The first phase of web development should be the inquiry system, such as grade report, student information, student's class schedule. The students can only access their own information by personal identification number (PIN) which is provided via internet too. And then the registration online should be launched. The web development should be provided after the whole system of client/server system is run for a cycle. The reason is the errors or the better solutions can be fixed to the appropriate way before starting the web development.

Student's information is in the database server which can access the information from every point of LAN connection. The executive or the instructor can view the

report of the student by web. At this point, the security and the rights of user to access the information must be organized.

When the system becomes large, the users have to be familiar with the computerized system and high technology. The user's training is more important. The staffs of IT department have to get the training too. The specific job must be assigned clearly to the staffs such as system administration, database administration, network administration, system analyst, technical support, application programmer.



APPENDIX A PROGRAM INTERFACE AND REPORT DESIGN ** SINCE 1969

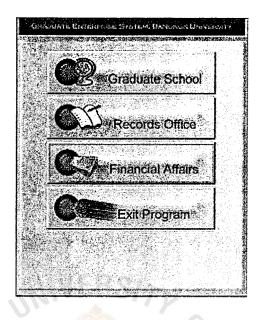


Figure A.1. The DSRS Main Menu.

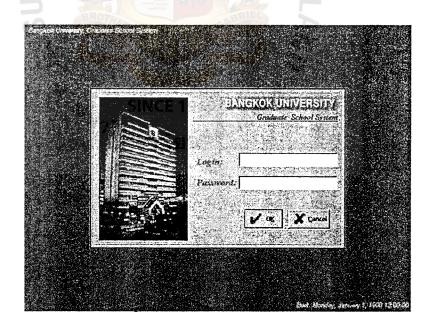


Figure A.2. The DSRS Login Screen.

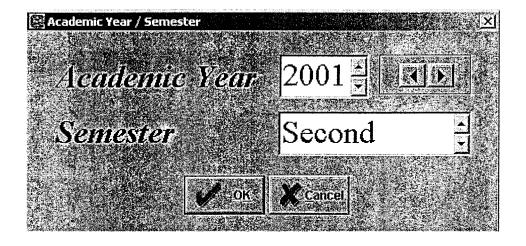


Figure A.3. The DSRS Academic Year and Semester Selection.



Figure A.4. Main Menu Graduate School.

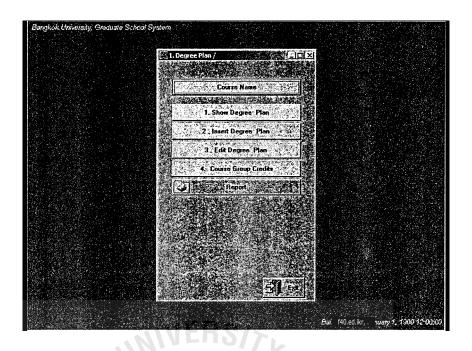


Figure A.S. Main Menu Degree Plan.

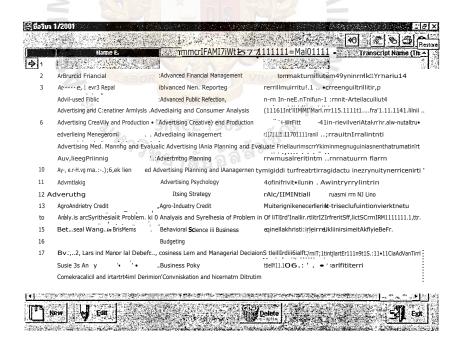


Figure A.6. Course Name Screen.

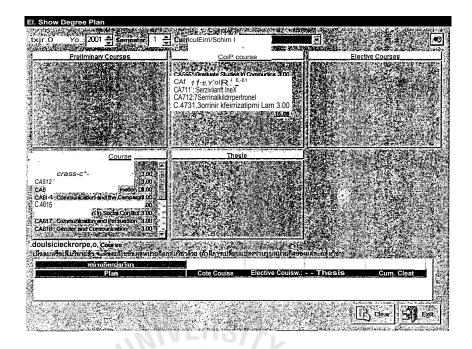


Figure A.7. Show Degree Plan Screen.

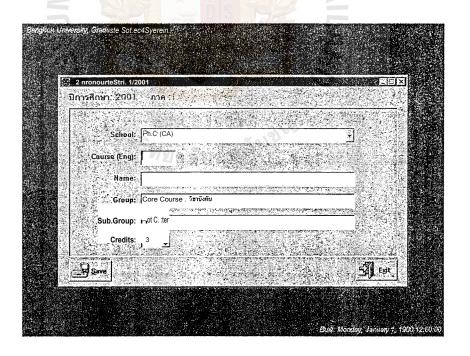


Figure A.8. Insert Degree Plan Screen.

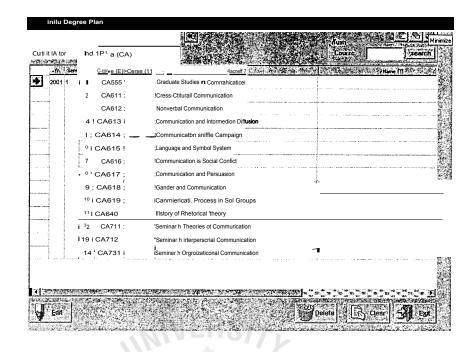


Figure A.9. Edit Degree Plan Screen.

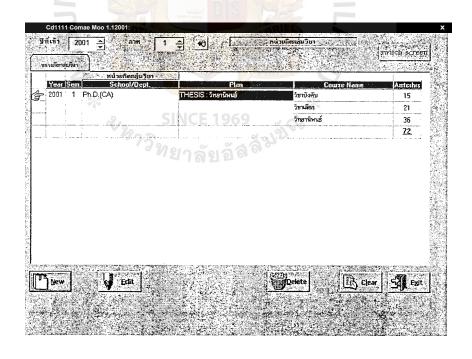


Figure A.10. Course Group Credits Screen.

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4. CA555 Graduate Studies in Communication	3.0D	
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CA712 Seminar in Interpersonal Communication	3.00	
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msoci		
CAeII Croaa-Cuttural Cornmunication	3.00	
CA012 Ncetverbet Communketon	3.00	

Figure A.11. Degree Plan Report.

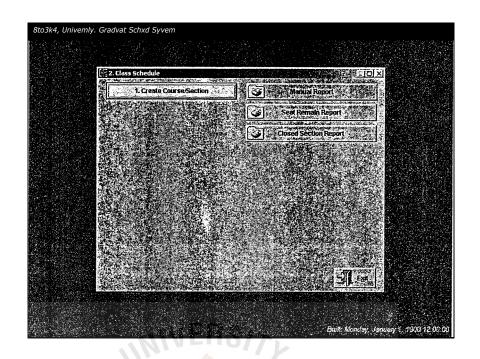


Figure A.12. Main Menu Course Schedule.

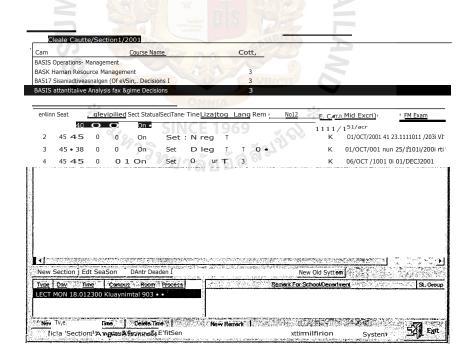


Figure A.13. Course Schedule Screen.

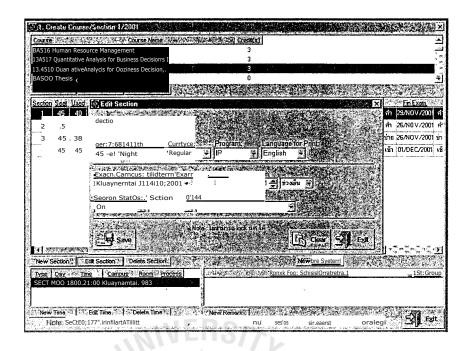


Figure A.14. New Course Schedule Screen.

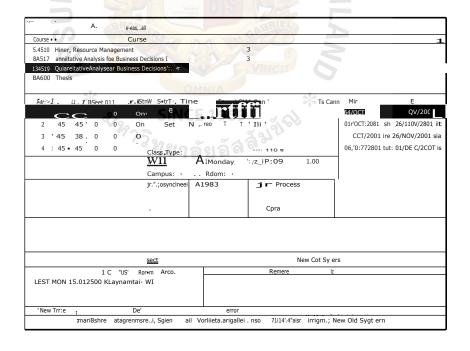


Figure A.15. New Time Course Schedule Screen.

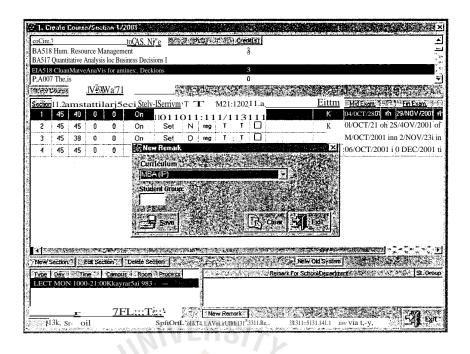


Figure A.16. New Remark Course Schedule Screen.

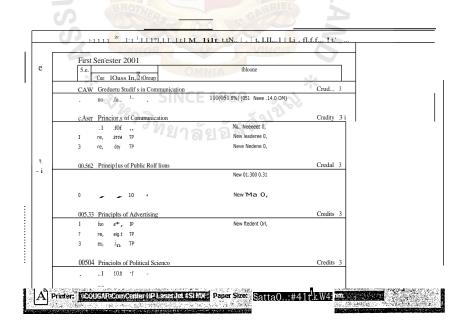


Figure A.17. Manual Registration Report.

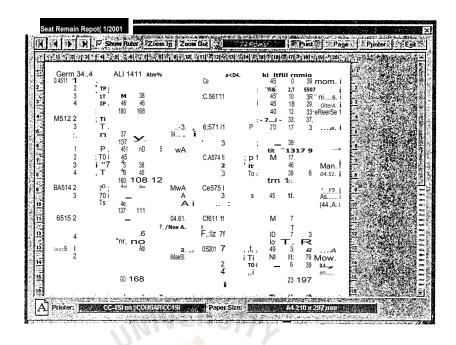


Figure A.18. Seat Remain Report.

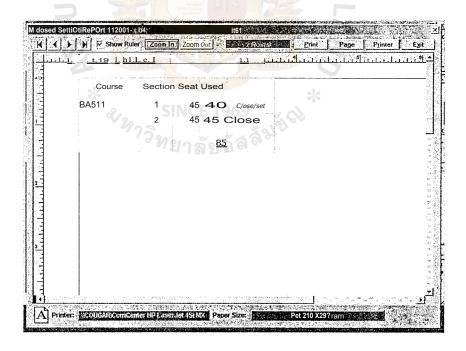


Figure A.19. Closed Course Section Report.

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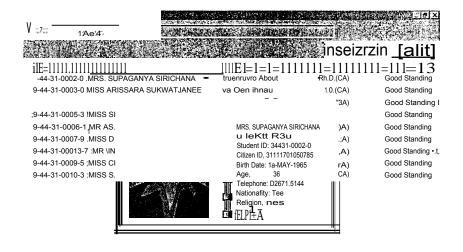




Figure A.20. Student Inquiry Screen.

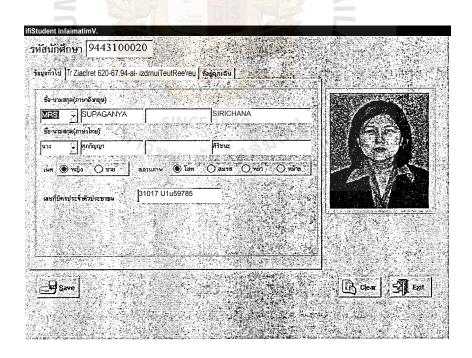


Figure A.21. Student Information Screen.

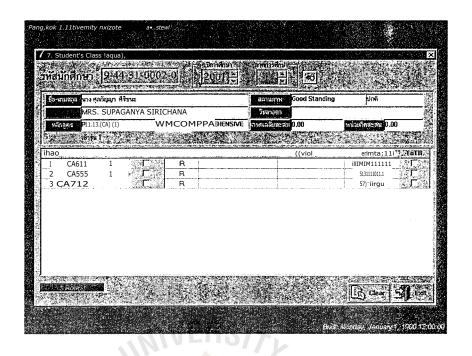


Figure A.22. Student Class Infoiniation Screen.

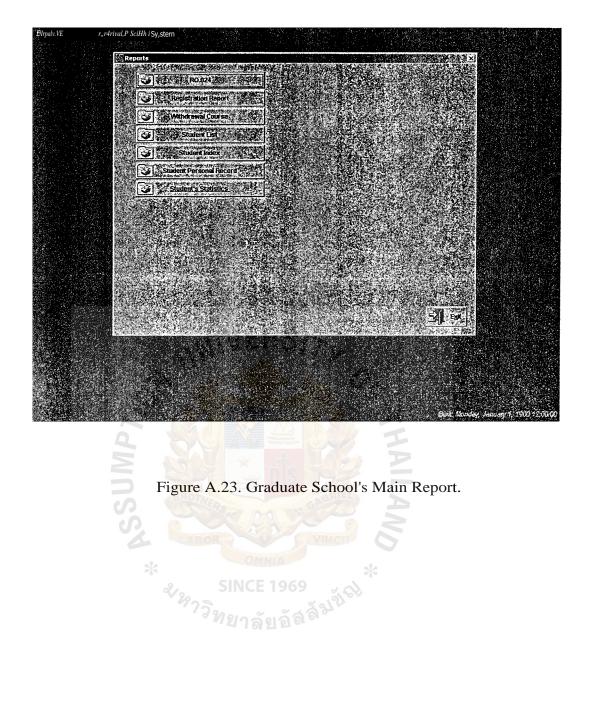


Figure A.23. Graduate School's Main Report.

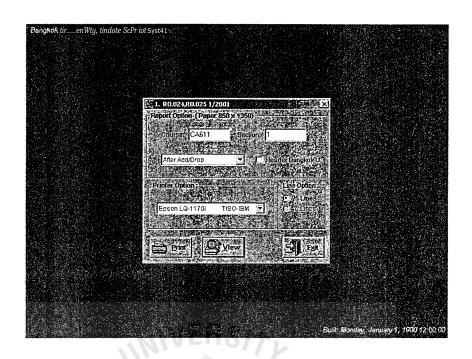


Figure A.24. RO.024 Report Screen (Student List in Class).

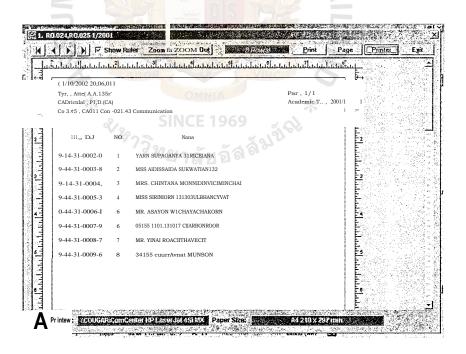


Figure A.25. RO.024 Report (Student List in Class).

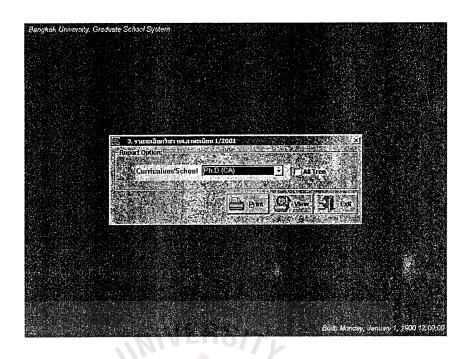


Figure A.26. Student's Registered Courses Report Screen.

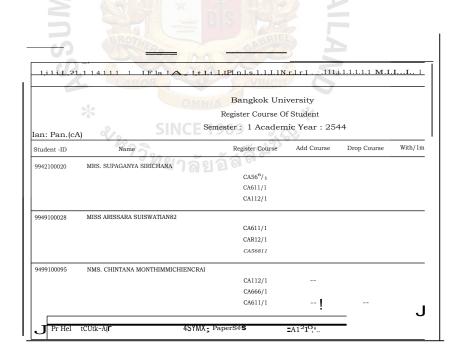


Figure A.27. Student's Registered Courses Report.

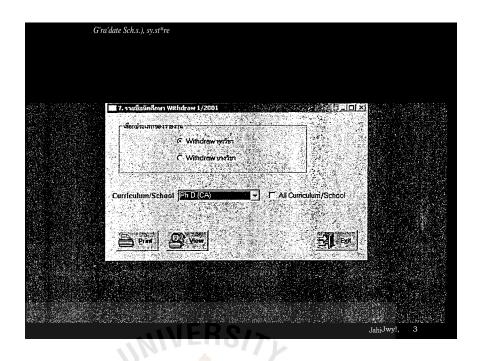


Figure A.28. Student Withdrawal Courses Report Screen.

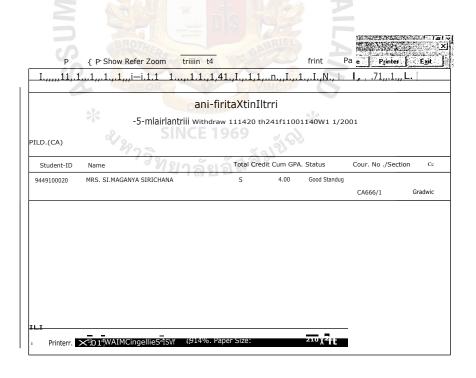


Figure A.29. Student Withdrawal Courses Report.

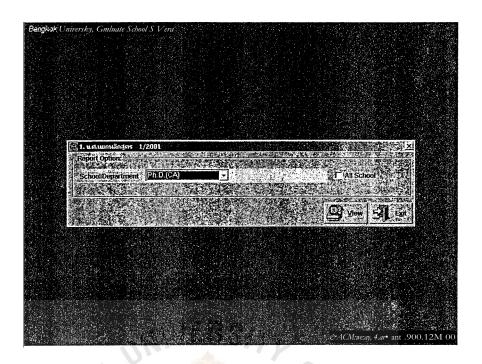


Figure A.30. Student List Report Screen.

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	*	GIG	Bangkok University aduate Student for Academic Year 1 /2001	Poi 16001,2002:
		12923	Ph.D.(CA) Group 1	
	No.	Student ID	Name	
	1.	9443100020	MRS. SUPAGANYA SERICHANA	
	2.	9443100038	MISS ARISSARA SUKWATJANE6	
	3.	9443100046	MRS. CHINTANA MONTHIENVICHIENCHAI	
	4.	9443100063	MISS SIRINTORN BHIBULBHANUVAT	
-: 7.	5,	9443100061	MR. ASAWIN WICHAYACHAKORN	
	6.	9443100079	MISS DOUNGTIP CHAREONROOK	
	7.	9443100087	MR. VINAI ROACHTHAVIL1T	
	8.	9443100095	MISS CHINTAWEE KASEMSUK	

Figure A.31. Student List Report.

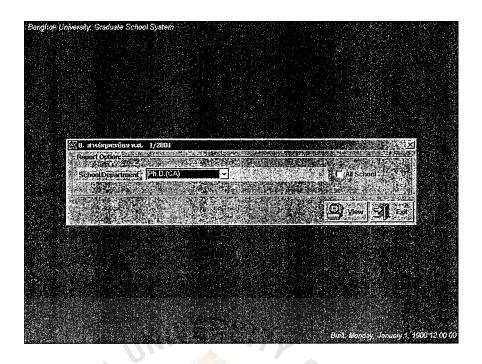


Figure A.32. Student Index Report Screen.

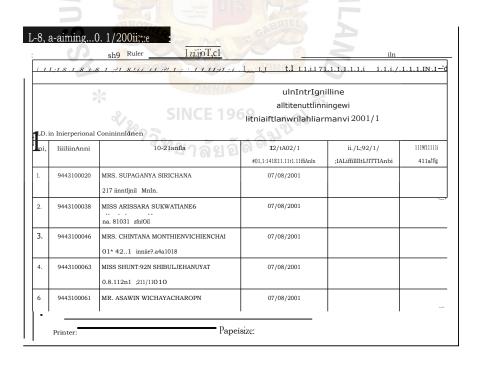


Figure A.33. Student Index Report.

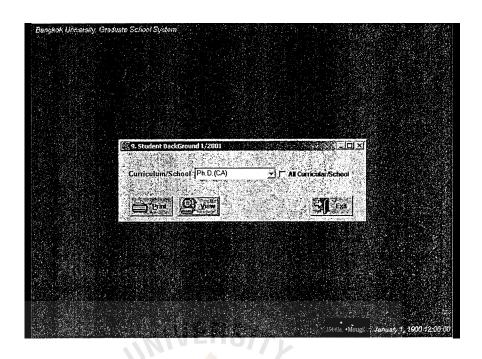


Figure A.34. Student Personal Record Report Screen.

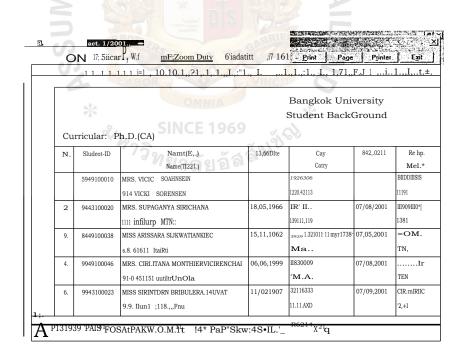


Figure A.35. Student Personal Record Report.

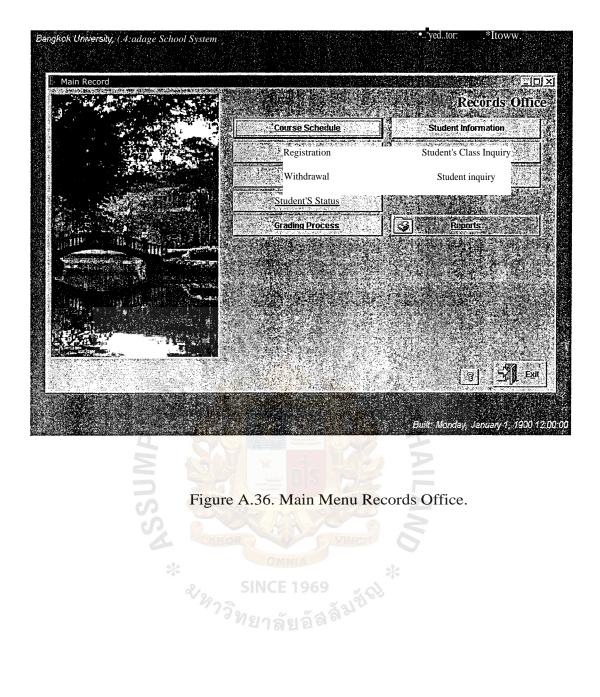


Figure A.36. Main Menu Records Office.

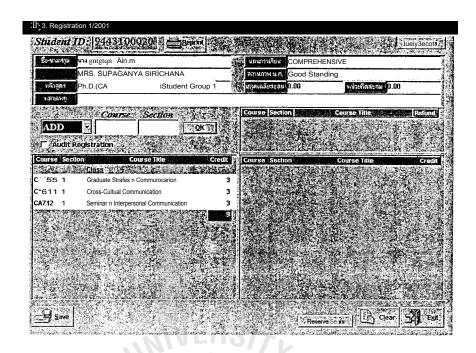


Figure A.37. Registration Screen.

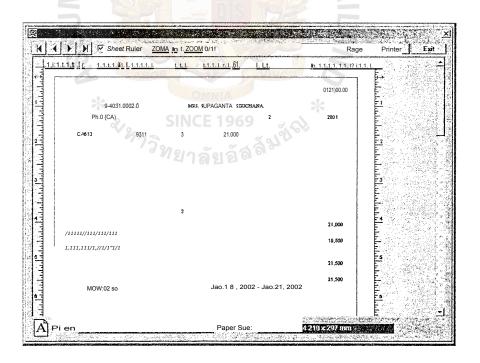


Figure A.38. Report of Student Registration / Receipt.

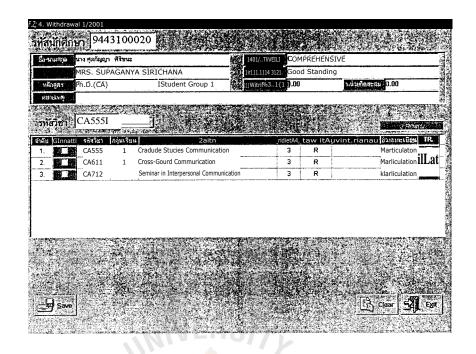


Figure A.39. Withdrawal Courses Screen.

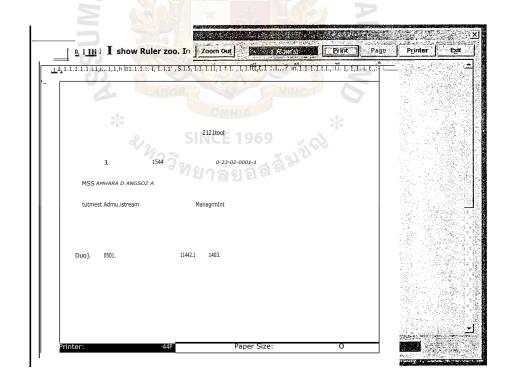


Figure A.40. Withdrawal Courses Report.

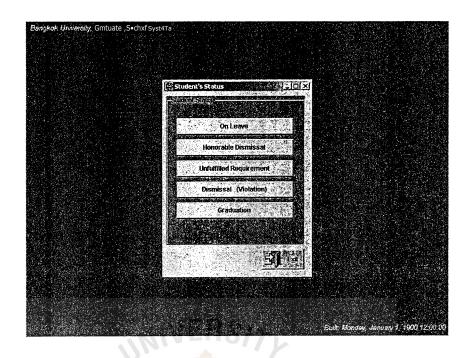


Figure A.41. Student's Status Main Menu.

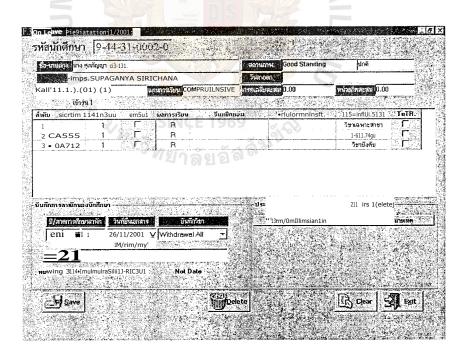


Figure A.42. On Leave Screen.

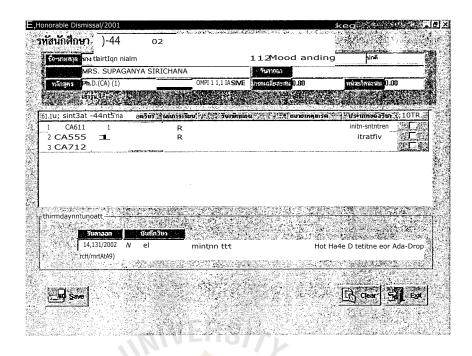


Figure A.43. Honorable Dismissal Screen.

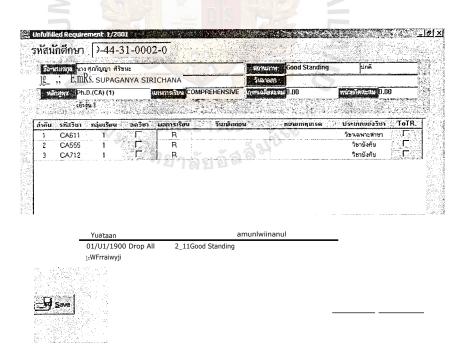


Figure A.44. Unfulfilled Requirement Screen.

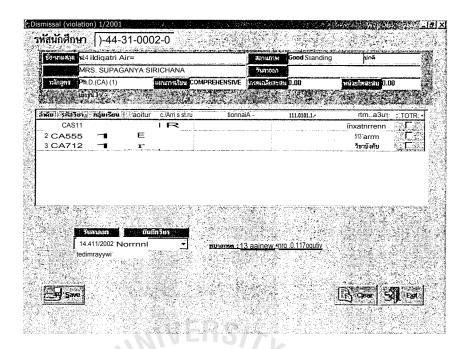


Figure A.45. Dismissal Screen.

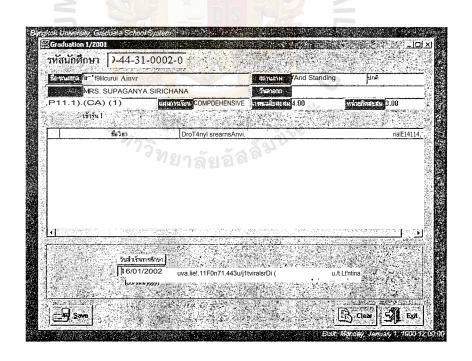


Figure A.46. Graduation Screen.

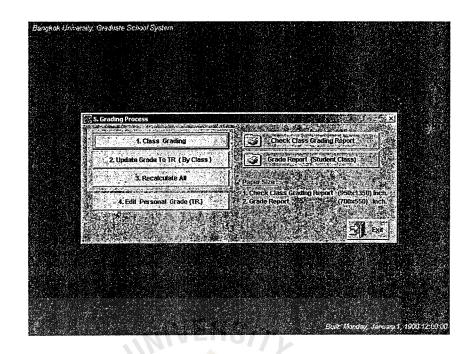


Figure A.47. Grading Main Menu.

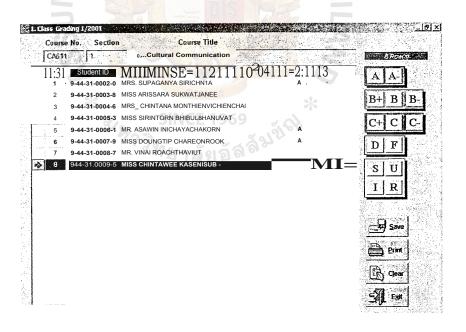


Figure A.48. Class Grading.

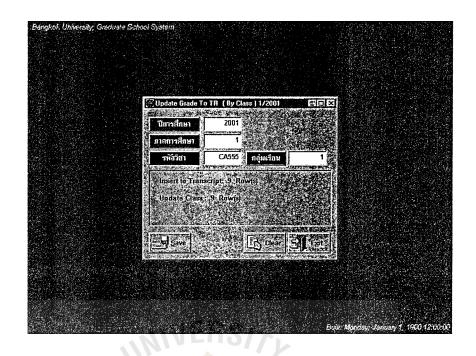


Figure A.49. Transfer Grade to Transcript.

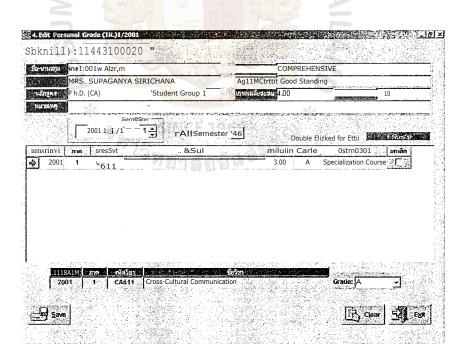


Figure A.50. Edit and Insert Grade.

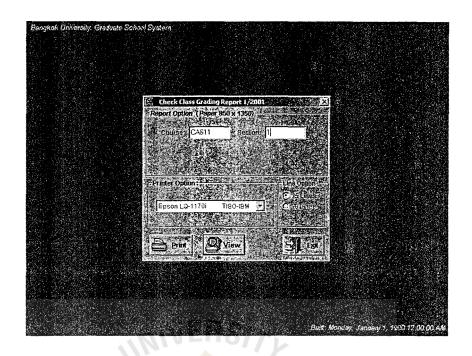


Figure A.51. Class Grade Report Screen.

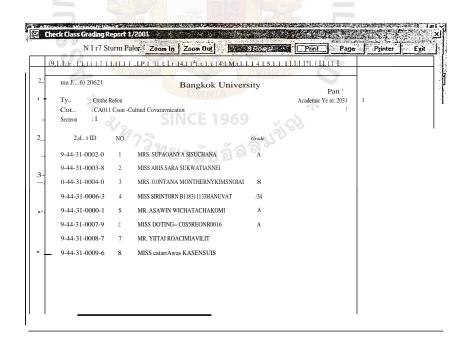


Figure A.52.. Class Grade Report.

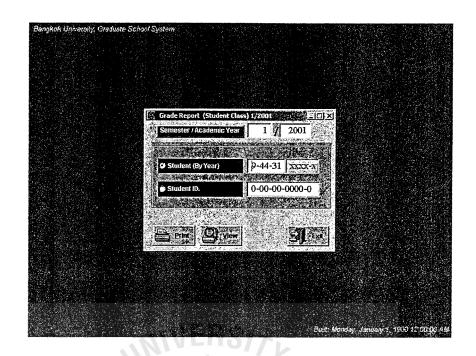


Figure A.53. Student Grade Report Screen.

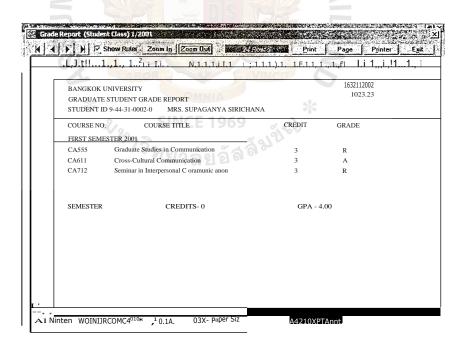


Figure A.54. Student Grade Report.

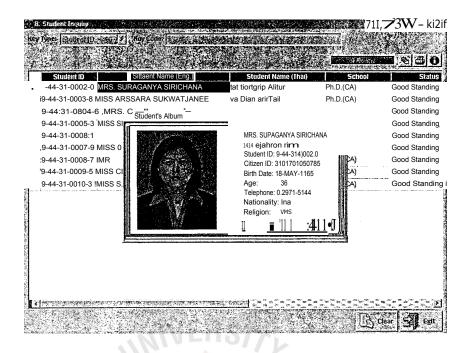


Figure A.55. Student Inquiry Screen.

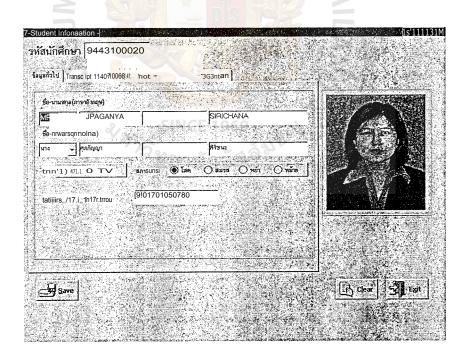


Figure A.56. Student Information Screen.

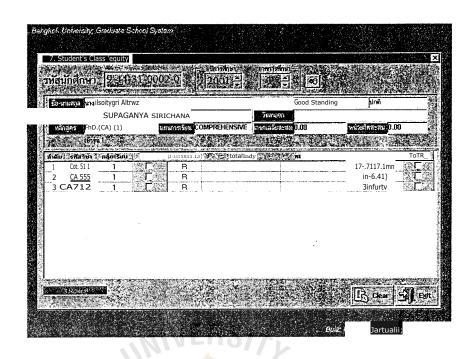


Figure A.57. Student Class Infounation Screen.

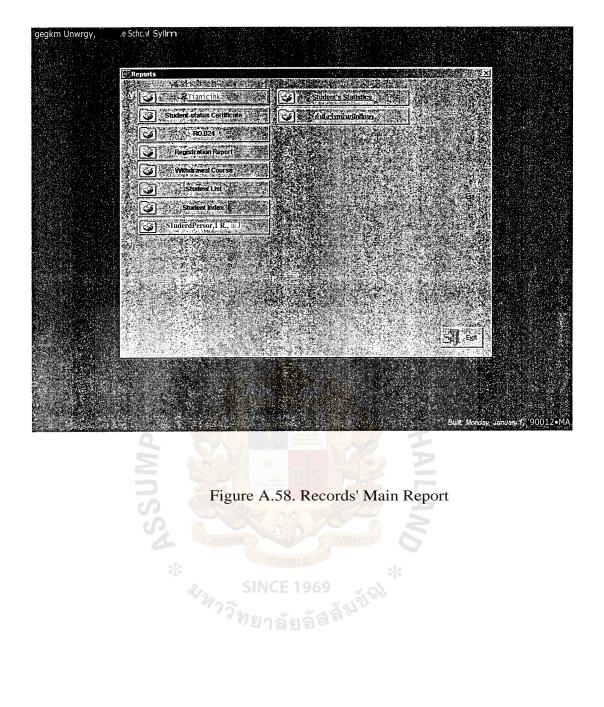


Figure A.58. Records' Main Report

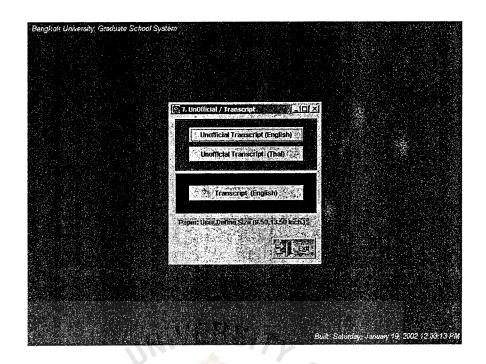


Figure A.59. Transcript Main Menu.



Figure A.60. Unofficial Transcript (English Language).



Figure A.61. Unofficial Transcript (Thai Language).

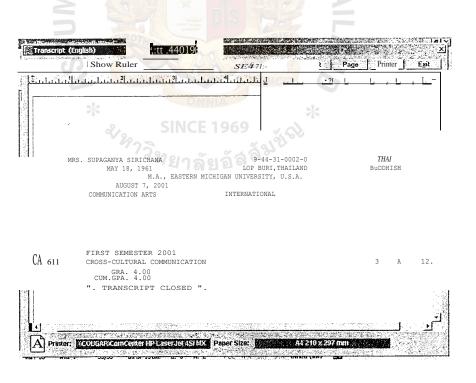


Figure A.62. Transcript.

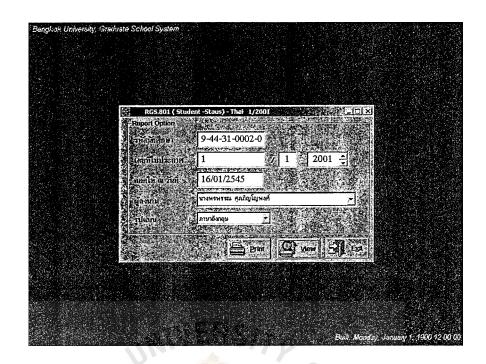


Figure A.63. Student-status Certificate Screen.

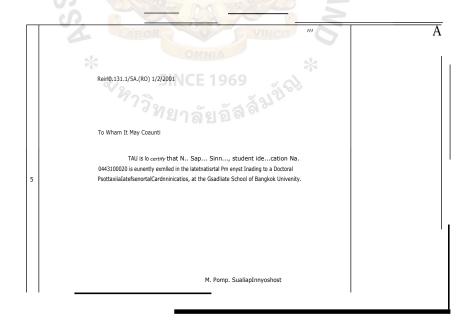


Figure A.64. Student-status Certificate (English Language).

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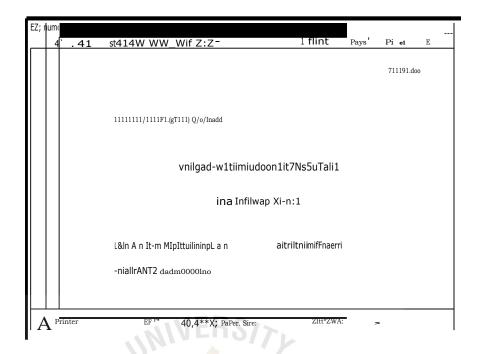


Figure A.65. Student-status Certificate (Thai Language).

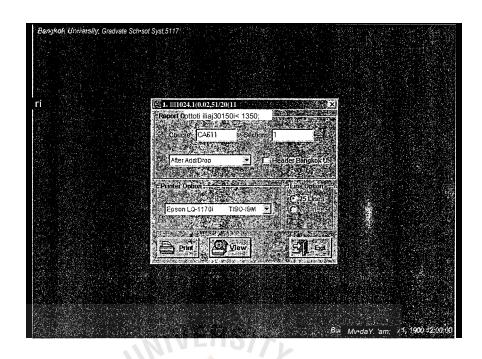


Figure A.66. RO.024 Report Screen (Student List in Class).

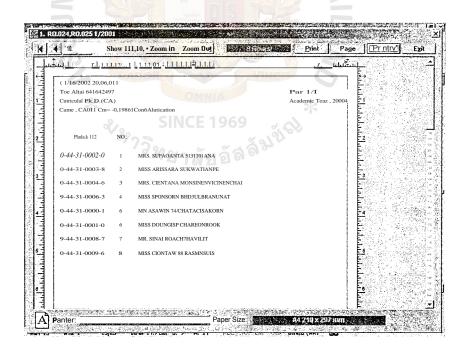


Figure A.67. RO.024 Report (Student List in Class).

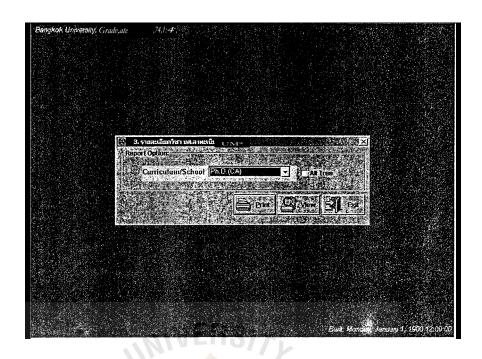


Figure A.68. Student's Registered Courses Report Screen.

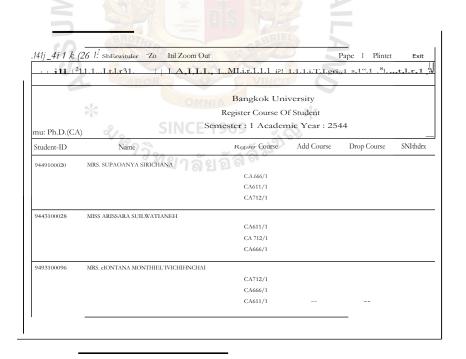


Figure A.69. Student's Registered Courses Report.

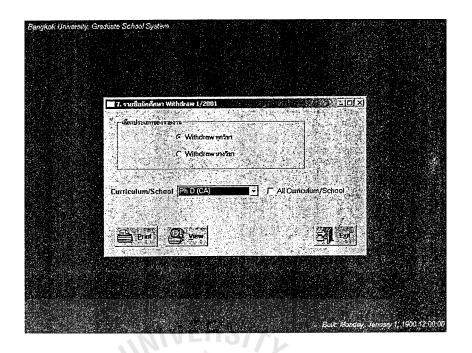


Figure A.70. Student Withdrawal Courses Report Screen.

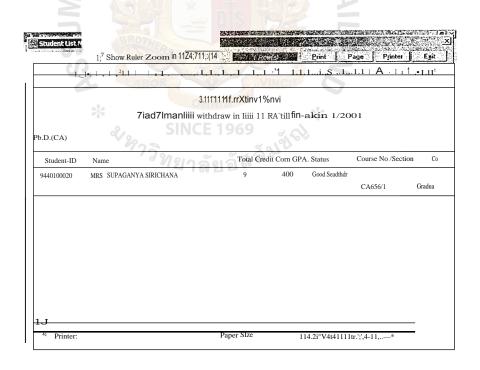


Figure A.71. Student Withdrawal Courses Report.

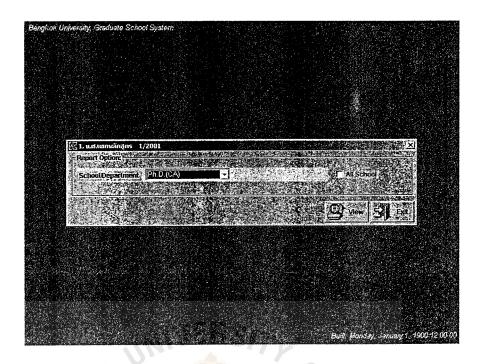


Figure A.72. Student List Report Screen.

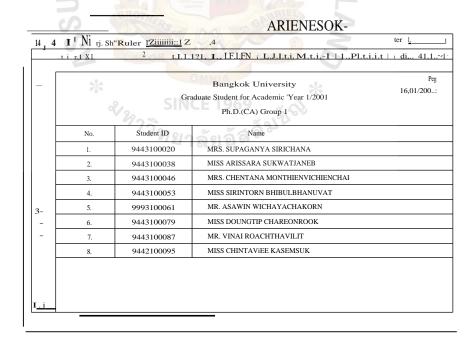


Figure A.73. Student List Report.

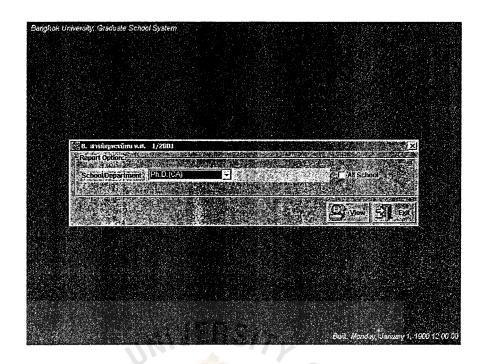


Figure A.74. Student Index Report Screen.

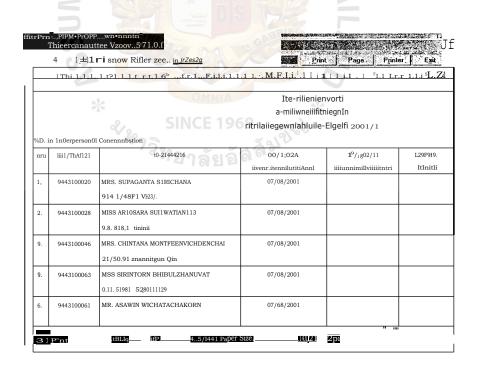


Figure A.75. Student Index Report.

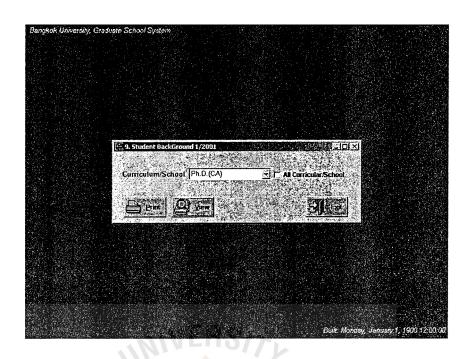


Figure A.76. Student Personal Record Report Screen.

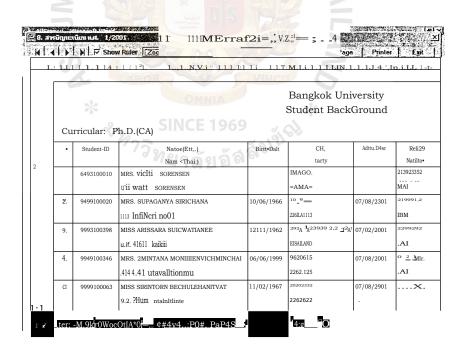


Figure A.77. Student Personal Record Report.

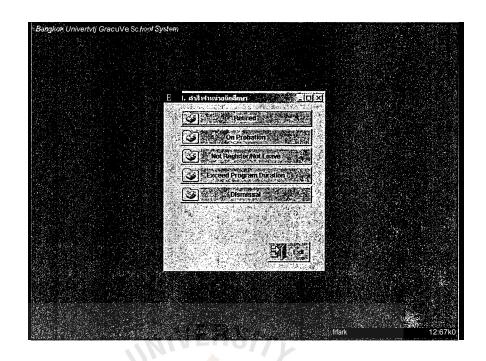


Figure A.78. Student's Status Main Menu.



Figure A.79. Student's Status Process Screen.

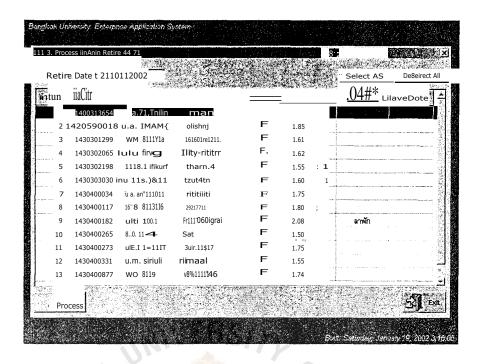


Figure A.80. Student's Status Process Screen — Retired, On Probation, Not Filed for A Leave of Absence, Exceed the Limit Year.

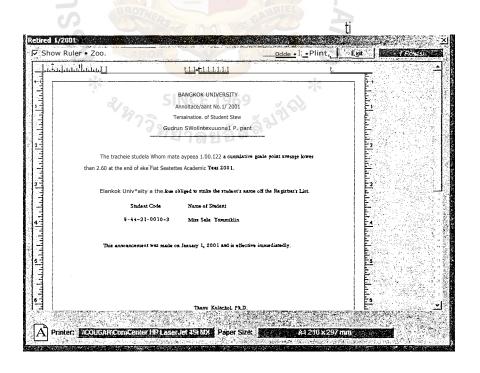


Figure A.81. Termination of Student Status Announcement (Cumulative GPA. Lower Than 2.50).

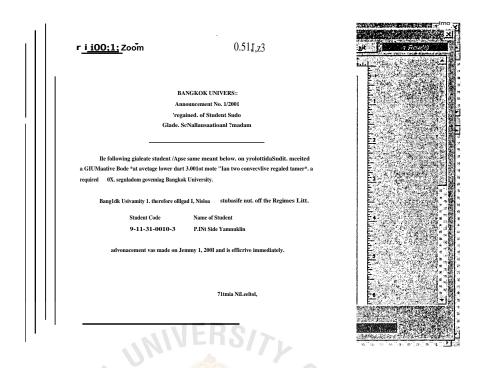


Figure A.82. Termination of Student Status Announcement (On Probation and Has Received Cumulative GPA. Lower Than 3.00).

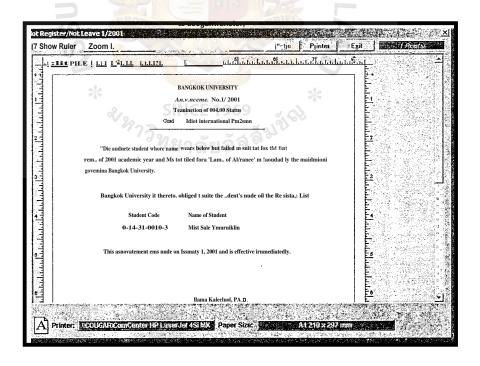


Figure A.83. Termination of Student Status Announcement (Failed to Register and Not Filed for A Leave of Absence).

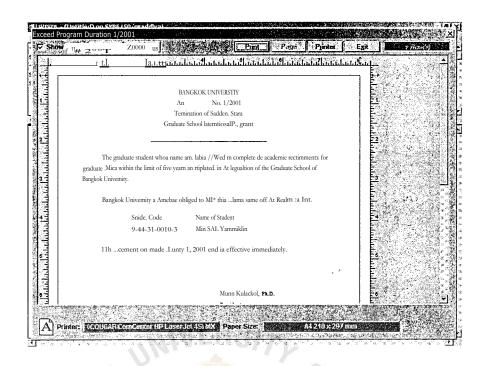


Figure A.84. Retired Student Announcement Report (Failed to Complete the Academic Requirements Within the Limit Years).

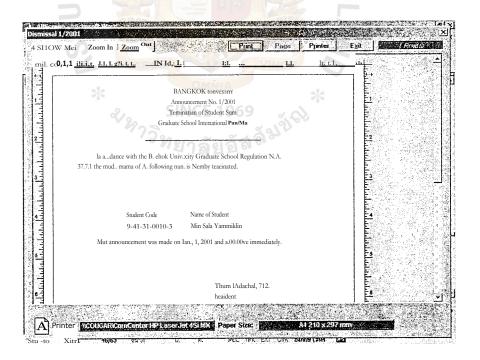


Figure A.85. Telininated Student Announcement Report (Regulation Violation).

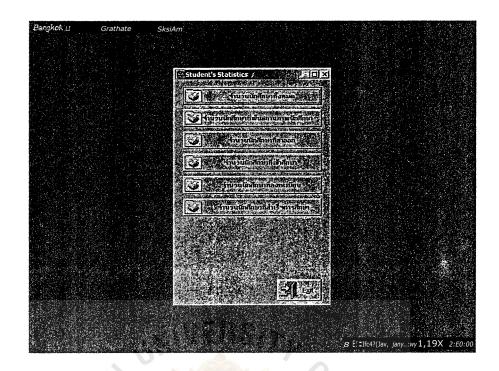


Figure A.86. Student's Statistic Report.

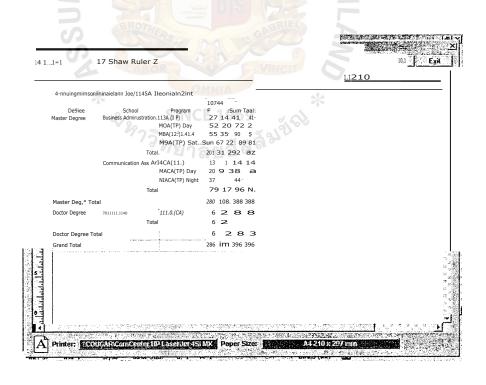


Figure A.87. Student's Statistic Report (Total).

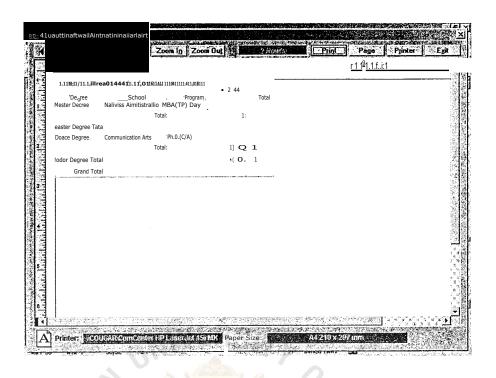


Figure A.88. Student's Statistic Report (Teilninated Student).

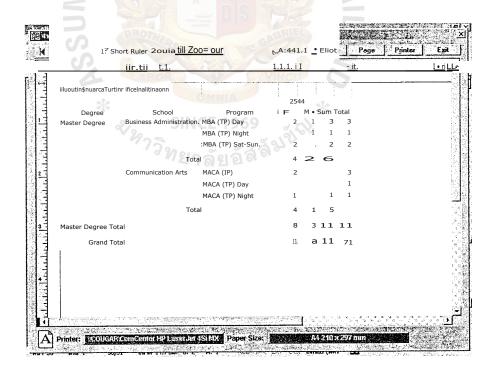


Figure A.89. Student's Statistic Report (Resigned Student).

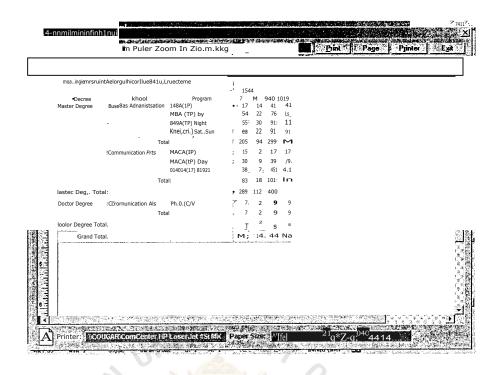


Figure A.90. Student's Statistic Report (Admitted Student).

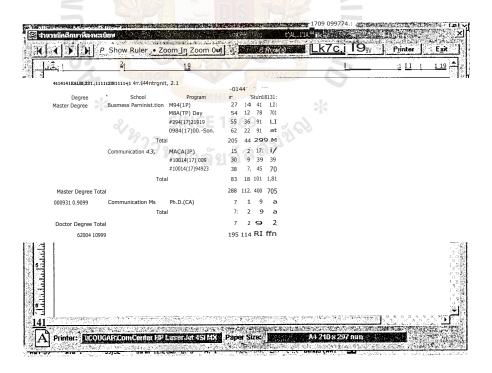


Figure A.91. Student's Statistic Report (Registered Student).

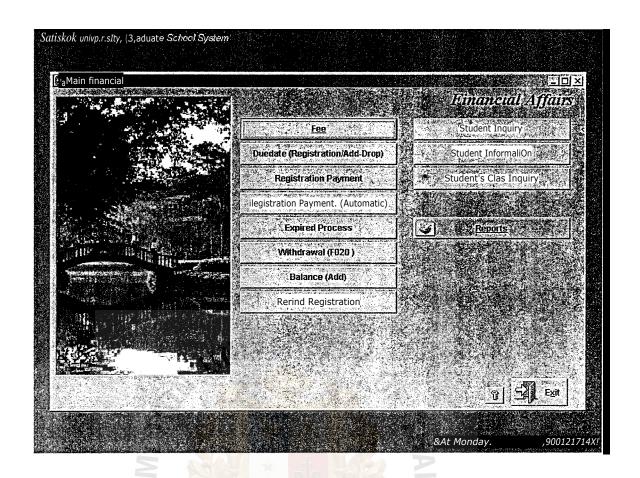


Figure A.92. Main Menu Financial Affairs.

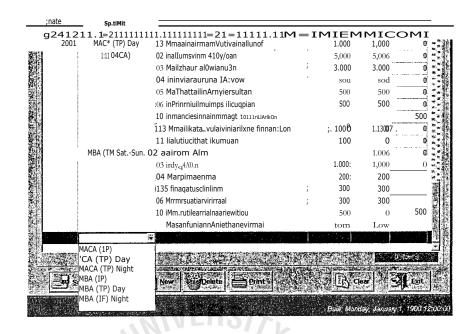


Figure A.93. Fee Management Screen.

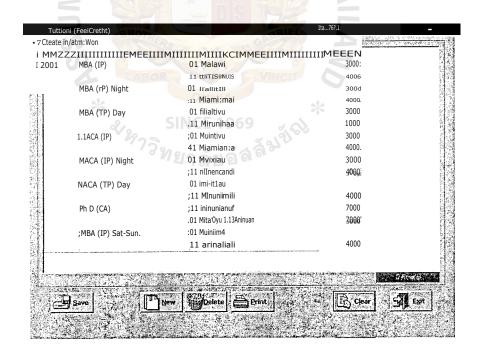


Figure A.94. Tuition Management Screen.

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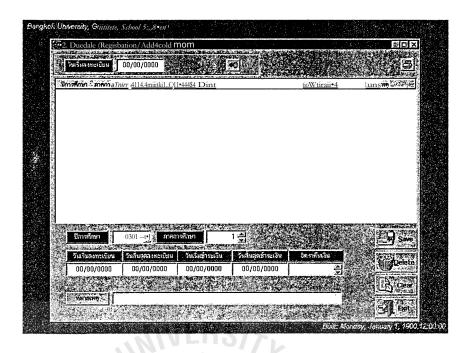


Figure A.95. Due Date of Registration Payment Screen.

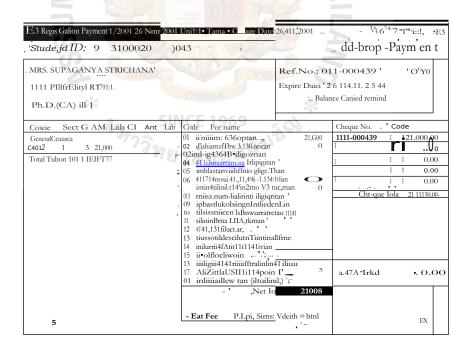


Figure A.96. Registration Payment Screen.

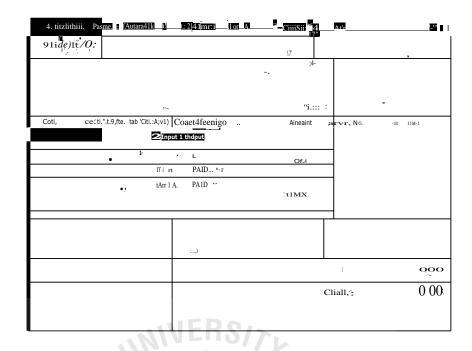


Figure A.97. Registration Payment Screen (Automatic Save).



Figure A.98. Expired Registration Screen.

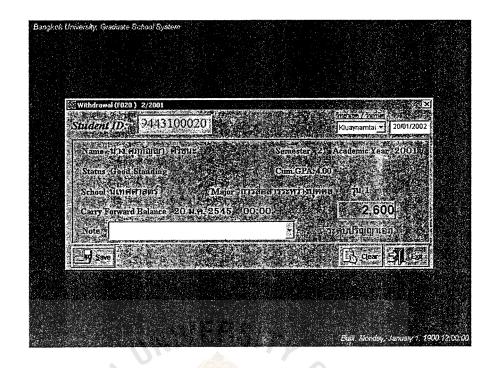


Figure A.99. Withdrawal Balance Screen.

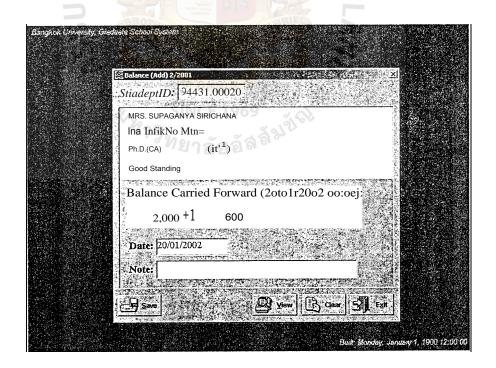


Figure A.100. Balance Add Screen.

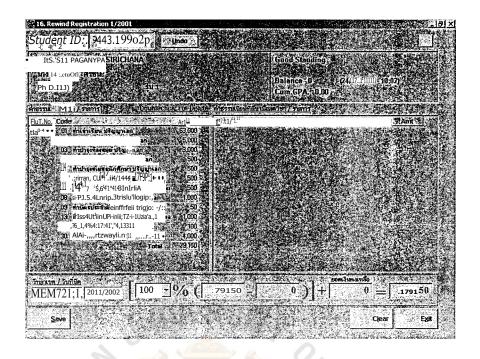


Figure A.101. Rewind Registration Screen.

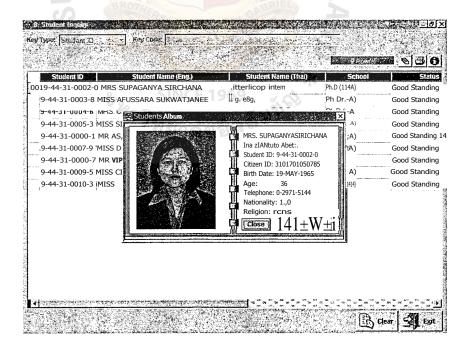


Figure A.102. Student Inquiry Screen.

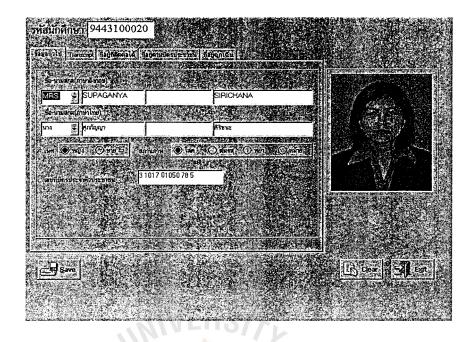


Figure A.103. Student Information Screen.

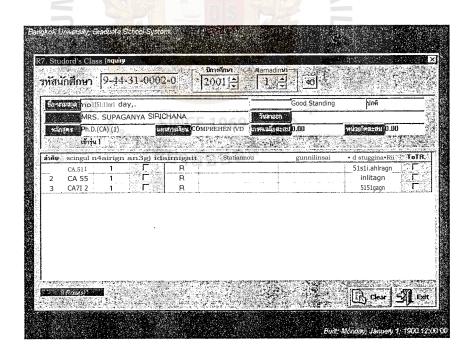


Figure A.104. Student Class Information Screen.

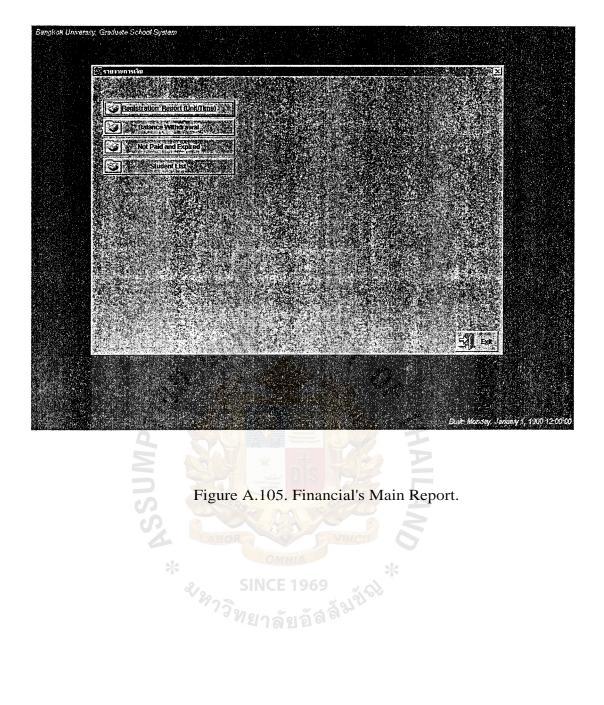


Figure A.105. Financial's Main Report.

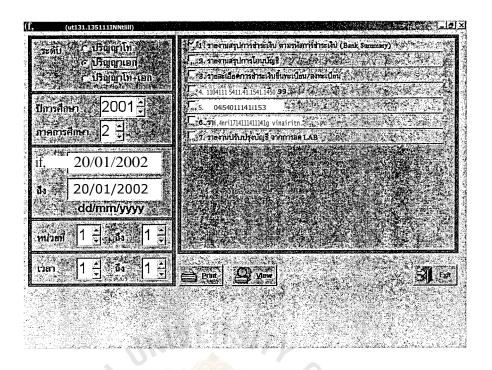


Figure A.106. Registration Payment Report.

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1	5I 1f11niatnw 4169	1	73,500
	M.114111111r0elettfti 71641	1	73,500
8	nritrnmnilno iltim	1	73,500
10	innfieriblbYn.41601	2	147,000
12	111narrstatNtiriei	1	73,500
	`II tt	5	441,000

Figure A.107. Registration Payment Summary Report.

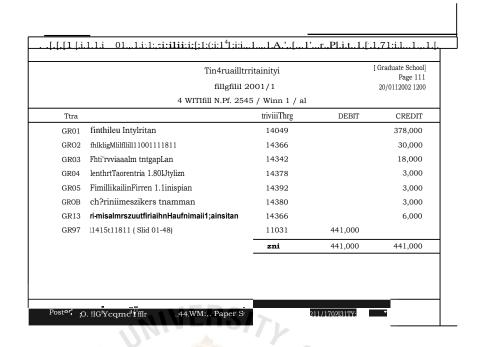


Figure A.108. Summary Registration Payment Transfer Report.

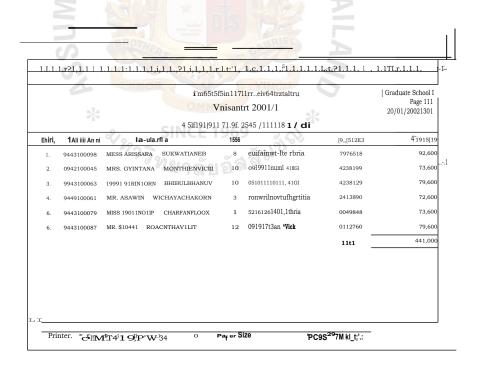


Figure A.109. Registration Payment List Report.

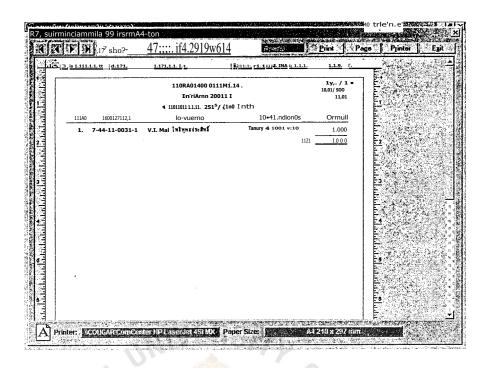


Figure A.110. Balance Summary Report.

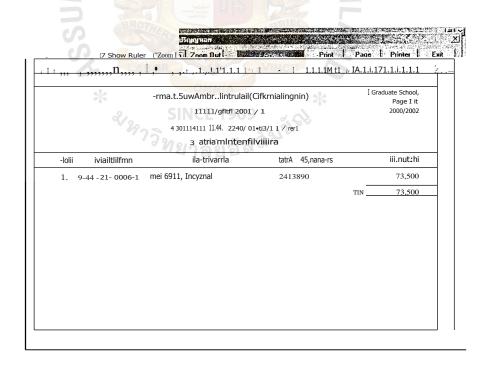


Figure A.111. Check Payment Report.

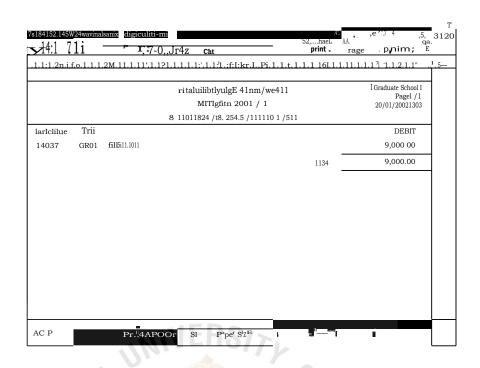


Figure A.112. Summary Registration (Drop) Report.

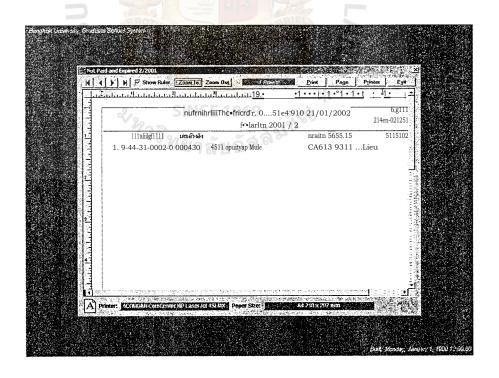


Figure A.113. Not Paid Transaction Report.

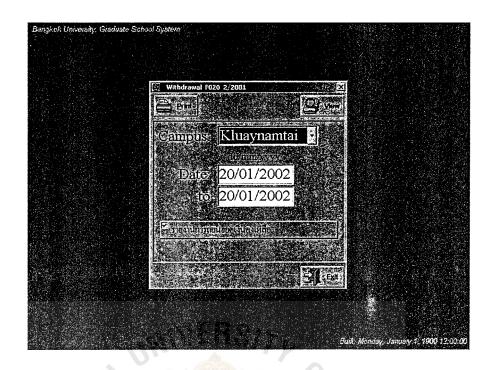


Figure A.114. Withdrawal Balance Screen.

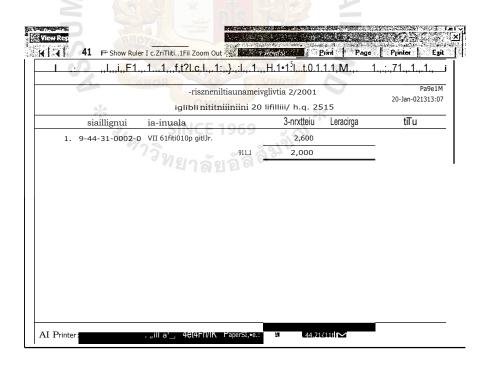


Figure A.115. Withdrawal Balance Report.

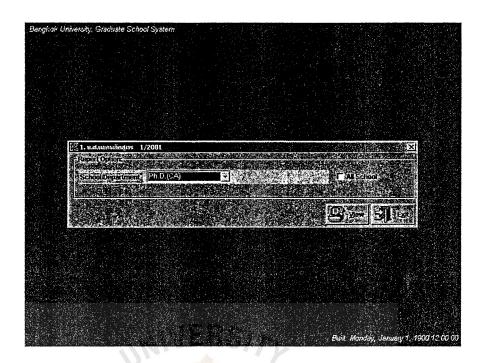


Figure A.116. Student List Report Screen.

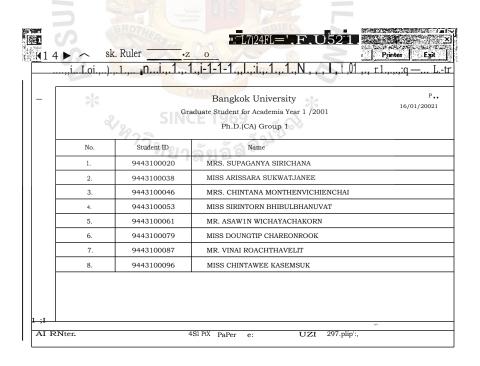


Figure A.117. Student List Report.



Table B.1. Student Information Table Schema.

Attribute Name	Description	Data Type	Width
StudentID	Student Identification No.	Character	10
TNameT	Title Name (Thai)	Character	20
FNameT	First Name (Thai)	Character	40
MNameT	Middle Name (Thai)	Character	30
LNameT	Last Name (Thai)	Character	45
TNameE	Title Name (Eng.)	Character	20
FNameE	First Name (Eng.)	Character	40
MNameE	Middle Name (Eng.)	Character	30
LNameE	Last Name (Eng.)	Character	45
StStatus	<student code="" status="" table=""></student>	Integer	-
BirthDate	Birth DateSINCE 1969	Date	-
Gender	Gender Gender	Bit	-
School	<school code="" table=""></school>	Character	3
National	<nationality code="" table=""></nationality>	Character	3
PreviousEducation	< Previous Education Code Table>	Character	4
PreviousDegree	< Previous Degree Code Table>	Character	4
AdmissionDate	Admission Date	Date	-
GraduationDate	Graduation Date	Date	-

Table B.1. Student Information Table Schema. (Continued)

Attribute Name	Description	Data Type	Width
LeaveDate	Leave Date	Date	-
MStatus	Marital Status	Character	1
CitizenIll	Citizen ID. or Passport No.	Character	20
Religion	< Religion Code Table>	Character	2
Email	Email Address	Character	50
Balance	Balance	Numeric	(5,2)
BalanceDate	Balance Date	Date	-

Table B.2. Student Address: Mailing, Peimanent, Emergency.

Attribute Name	Description	Data Type	Width
StudentID	Student Identification No.	Character	10
AddressNo	Address No	Character	60
Street	Street	Character	50
District	District	Character	50
Province	<province code="" table=""></province>	Character	4
Country	<country code="" table=""></country>	Character	4
ZipCode	Zip Code	Character	10
PhoneNo	Phone No.	Character	30

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Table B.3. Curriculum Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
Semester	Semester	Character	1
School	<school code="" table=""></school>	Character	3
Course	Course Code	Character	6
CourseName	<course name="" table=""></course>	Character	5
CourseGroup	Type of Course	Character	2
SubCourseGroup	Sub-Type of Course	Character	2
Credits	Credits	Integer	-
PrerequisiteCourse	<pre><prerequisite course="" table=""></prerequisite></pre>	Bit	1

Table B.4. Course Name Table Schema.

Attribute Name	Description	Data Type	Width
Course	Course Code	Character	6
CourseName_T	Course Name (Thai)	Character	150
CourseName_E	Course Name (English)	Character	150

Table B.5. Curriculum Credits Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
School	<school code="" table=""></school>	Character	3
CourseGroup	Type of Course	Character	3
Plan	Plan of Study	Character	1
TotalCredits	Total Credits	Integer	-

Table B.6. Course Schedule Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
Semester	Semester	Character	1
Course	SINCE 1969 Course Najagaa	Character	6
CourseName	<course name="" table=""></course>	Character	5
Section	Section	Character	4
CosSectCode	Course + Section	Character	5
Seat	Total Seat	Integer	-
SeatUsed	Seat Used	Integer	-

Table B.6. Course Schedule Table Schema. (Continued)

Attribute Name	Description	Data Type	Width
SectionStatus	Section Status (Open/Close)	Character	1
SectionTime	Section Time (Day/Night)	Character	1
SectionType	Section Type	Character	1
Program	Program (Thai/Inter.)	Character	1
ExamCampus	Exam Campus	Character	1
MExTime	Midterm Exam	Date	-
FExTime	Final Exam	Date	-
Remark	Condition < Remark Table>	Bit	-

Table B.7. Course Schedule: Time Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
Semester	Semester	Character	1
CosSectCode	Course +Section	Character	5
Time	Time	Date Time	-

Table B.8. Course Schedule: Remark Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
Semester	Semester	Character	1
CosSectCode	Course +Section	Character	5
School	<school code="" table=""></school>	Character	3

Table B.9. Tuition Table Schema.

Attribute Name	Description	Data Type	Width
Year	Student's Entered Year	Character	4
School	<school code="" table=""></school>	Character	3
FeeCode	<fee code="" table=""></fee>	Character	3
Amount	Amount 7	Integer	-

Table B.10. Fee Table Schema.

Attribute Name	Description	Data Type	Width
Year	Student's Entered Year	Character	4
School	<school code="" table=""></school>	Character	3
FeeCode	<fee code="" table=""></fee>	Character	3
AmountSeml	Amount for Semester 1	Integer	-
AmountSem2	Amount for Semester 1	Integer	-
AmountSem3	Amount for Semester 1	Integer	-

Table B.11. Student's Registration Transaction Table Schema.

Attribute Name	Description	Data Type	Width
StudentlD	Student Identification No.	Character	10
Year	SINCE 1969 Academic Year	Character	4
Semester	Semester	Character	1
TransactionNo	Transaction Number	Character	5
CosSectCode	Course + Section	Character	5
RegType	Registration Type (Registration, Add, Drop)	Character	4
Paid	Registration Payment (Paid, Not Paid, Expired)	Character	1
PaidDate	Paid Date	Date	-

Table B.11. Student's Registration Transaction Table Schema. (Continued)

Attribute Name	Description	Data Type	Width
Unit	Paid Unit	Character	2
Time	Paid Time	Character	2
BankCode	Bank Code or Check No.	Character	15
TotalAmount	Total Amount	Integer	-

Table B.12. Student's Registration Transaction: Fee Payment Table Schema.

Attribute Name	Description	Data Type	Width
Year	Academic Year	Character	4
Semester	Semester	Character	1
TransactionNo	Transaction Number	Character	5
FeeCode	Fee Code	Character	3
Amount	Amount	Integer	-

Table B.13. Student's Class Table Schema.

Attribute Name	Description	Data Type	Width
Student1D	Student Identification No.	Character	10
Year	Academic Year	Character	4
Semester	Semester	Character	1
CosSectCode	Course + Section	Character	5
CourseName	<course code="" name="" table=""></course>	Character	5
Grade	<grade code="" table=""></grade>	Integer	-
Credits	Credits	Integer	-
RegType	Registration Type (Registration, Drop)	Character	1
WithdrawDate	Withdrawal Date	Date	

Table B.14. Student's On Leave Table Schema.

Attribute Name	Description	Data Type	Width
StudentID	Student Identification No.	Character	10
Year	Academic Year	Character	4
Semester	Semester	Character	1
TransactionDate	Transaction Date	Date	-
Status	<student code="" status="" table=""></student>	Integer	-

Table B.15. Student's Transcript Table Schema.

Attribute Name	Description	Data Type	Width
StudentID	Student Identification No.	Character	10
Year	Academic Year	Character	4
Semester	Semester	Character	1
Course	Course	Character	6
CourseName	<course name="" table=""></course>	Character	5
Grade	<grade code="" table=""></grade>	Integer	_
Credits	Credits	Integer	-

Table B.16. Student's Progress Table Schema.

Attribute Name	Description	Data Type	Width
StudentlD	Student Identification No.	Character	10
Year	Academic Year	Character	4
Semester	Semester	Character	1
GPA	GPA.	Numeric	(3,2)
Cum.GPA	Cum.GPA.	Numeric	(3,2)
TotalCredits	Total Credits	Integer	-

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