

SUPPLEMENTARY EXAM TRACKING SYSTEM (SETS)

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To my beloved father, mother, brothers and sister.

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ABSTRACT

This project – Supplementary Exam Tracking System (SETS) is aim to develop a platform to collaborate supplementary exam affairs among students, Registrar and Assistant Registrars (ARs) from exam department, and Bursar and Assistant Bursars (ABs) from financial department within the six campuses at Tunku Abdul Rahman College (TARC).

The SETS is a web-based application that developed using ASP.NET programming language. Besides that, Rational Unified Process (RUP) that advocates Object-Oriented Methodology (OOM) in system implementation and Unified Modeling Language (UML) for diagram modeling are selected as a guide in developing the proposed SETS system.

Through the SETS, students from different campuses can register their resit or repeat papers online and receive their reminded message if they forget or have not settled their payment. In addition, SETS is able to reduce the workload of Registrar and Assistant Registrars (ARs) from exam department whose jobs are multitasking in nature.

Overall, the proposed SETS system is significant to TARC as it can further enhance the college efficiency and effectiveness in delivering the customer services to students as well as increase the reputation of TARC.

ABSTRAK

Projek ini – *Supplementary Exam Tracking System (SETS)* adalah bertujuan membina satu rangkaian untuk kerjasama dalam hal ehwal pengambilan semula peperiksaan di antara pelajar-pelajar, Pendaftar bersama beberapa orang Penolong Pendaftarnya dari jabatan peperiksaan, dan Bendahari bersama beberapa orang Penolong Bendaharinya dari jabatan kewangan yang terdiri daripada enam cawangan di Kolej Tunku Abdul Rahman (KTAR).

SETS adalah perisian yang dibangunkan dengan menggunakan bahasa aturcara *ASP.NET*. Selain itu, ia juga berdasarkan konsep *Rational Unified Process (RUP)* yang menggalakkan penggunaan metodologi berorientasikan objek untuk membina sistem dan *Unified Modeling Language (UML)* bagi pemodelan gambar rajah. Kedua-dua konsep ini telah dijadikan sebagai panduan dalam pembangunan cadangan sistem SETS.

Melalui SETS, pelajar-pelajar dari kampus yang berlainan boleh mendaftar pengambilan semula peperiksaan mereka dengan perisian yang sedia ada dan menerima mesej peringatan mereka jikalau terlupa atau belum menjelaskan bayaran mereka. Di samping itu, SETS juga boleh mengurangkan beban kerja yang diberikan kepada Pendaftar dan beberapa orang Penolong Pendaftar dari jabatan peperiksaan.

Secara umumnya, cadangan sistem SETS ini penting untuk KTAR dalam peningkatan kecekapan dan keberkesanan dalam pemberian khidmat pelanggan kepada pelajar-pelajar, dan seterusnya ia memberi sumbangan untuk meningkatkan reputasi KTAR.

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LIST OF ABBREVIATIONS

AB	Assistant Bursar
ACCA	Association of Chartered Certified Accountants
ACH	Automated Clearing House
AR	Assistant Registrar
ASP	Active Server Page
ATM	Automated Teller Machine
BCP	Business Continuity Plan
B2B	Business-to-Business
B2C	Business-to-Consumer
C2C	Consumer-to-Consumer
CeL	College E-Learning System
CIMA	Chartered Institute of Management Accountants
CIT	Communication Information Technology
CLR	Common Language Runtime
CRC	Class-Responsibility-Collaboration)
E2B	Enterprise-to-Business
EBPP	Electronic bill presentment and payment
EC	E-commerce / Electronic commerce
EDI	electronic data interchange
EZ	Existing Over Due
FEDI	financial electronic data interchange
ICSA	Institute of Chartered Secretaries and Administrators

IIS	Internet Information Services
IS/IT	Information System / Information Technology
IT	Information Technology
MCA	Malaysian Chinese Association
OMG	Object Management Group
OOM	Object-Oriented Methodology
PIN	personal identification number
PKI	Public Key Infrastructure
RAD	Rapid Application Development
RUP	Rational Unified Process
SAS	School of Art and Science
SDLC	software development life cycle
SETS	Supplementary Exam Tracking System
SMS	Short Message Service
SQL	Structural Query Language
SSL	Secure Socket Layer
TAR	Tunku Abdul Rahman
TARC	Tunku Abdul Rahman College
TOS	Term of Service
UML	Unified Modeling Language
UPS	Uninterruptible Power Supply
UTM	Universiti Teknologi Malaysia
VISA	Visa International Service Association
WYSIWYG	What You See Is What You Get
XP	Extreme Programming

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CHAPTER 1

PROJECT OVERVIEW

1.1 Introduction

The title for the project is Supplementary Exam Tracking System (SETS). From the title itself, “Supplementary Exam” refers to resit and repeat papers that are registered by the students and “Tracking” refers to validation, confirmation and information that can be made through the processes starting from registration for resit and repeat papers, billing, payment and finishing on retrieving the total number of resit and repeat students for each subject of particular campus.

This project is aimed to enhance the collaboration between students, Registrar and Assistant Registrars (ARs) from exam department, and Bursar and Assistant Bursars (ABs) from financial department within the six campuses of Tunku Abdul Rahman College (TARC), which include Kuala Lumpur Main Campus, Penang Branch Campus, Perak Branch Campus, Johor Branch Campus, Pahang Branch Campus and Sabah Branch Campus.

Besides that, SETS allows students to register their resit and repeat papers online, anywhere and at any time within the given period. This is very convenient for resit and repeat students, especially for those students with EZ status (EZ: Existing

Over Due) and are working outstation. At the same time, it is able to reduce the workload of Registrar and ARs from exam department (whose jobs are multitasking in nature) to collect, check, and enter the data from manual forms into computer.

Overall, SETS is an online system that would replace the traditional manual form system. This SETS is able to reduce the processing period from two months plus to one month. At the same time, students are empowered to register their resit and/or repeat paper(s) by themselves, instead of Registrar or ARs doing the registration on behalf of them.

1.2 Background of Problem

Currently the TARC's main campus is located at Setapak, Kuala Lumpur, with five other branches located in five different states (Penang, Perak, Johor, Pahang and Sabah) to provide education to the public. As TARC has six campuses within the nation, problem concerning the lack of collaboration among Registrar and ARs from exam department and Bursar and ABs from financial department in different campuses arise.

This is due to the current environment that does not provide a proper platform to allow Registrar and ARs from exam department and Bursar and ABs from financial department of various campuses to collaborate the exam management affairs among themselves. As a result, it slow down the process of registration for resit and repeat papers, billing, payment and retrieve the total number of resit and repeat students for each subject, which will serve as input to the Exam Scheduling System for each particular branch campus.

1.3 Statement of the Problem

As briefed on the previous section, on the whole, the problems faced by the Registrar and ARs from exam department of TARC can be listed as below:

- 1) Insufficient time to prepare the examination timetable and invigilators duty schedule, especially during the third (short) semester. This resulted in releasing the examination timetable and invigilators duty schedule at last minute.
- 2) Increase the workload of Registrar and ARs. Due to their jobs which are multitasking in nature, they not only need to be in-charge of photostating the tutorials questions, mid-term test questions, exam questions, various forms, memos and others, but worst of all is they have to delegate extra responsibilities; such as Johor Branch Exam Department, AR also in-charge of school office affairs.

On the other hand, the problems faced by the resit and repeat students of TARC can be listed as below:

- 1) EZ status students from outstation faced difficulty to collect and fill in their resit and/or repeat registration form(s), due to their existing work.
- 2) Students do not aware of the fact that not all subjects are offered for resit/repeat in a particular semester; the total of their main subjects plus resit/repeat subjects cannot exceed seven subjects.

1.4 Project Objectives

The following is a list of objectives for the proposed system – SETS:

- 1) To study how to implement the tracking system for registration of resit/repeat papers in an online environment that would make the registration process more efficient and error free.
- 2) To analyze TARC's existing circumstances in relation to better collaboration among Registrar and ARs from exam department and Bursar and ABs from financial department in different campuses.
- 3) To design an interface to allow information sharing among Registrar and ARs from exam department and Bursar and ABs from financial department in different campuses.
- 4) To develop a system that allows the students to register their resit and/or repeat paper(s) without the need of face-to-face meeting with the college staff.

1.5 Project Scope

The proposed system – SETS, is developed based on TARC context and circumstances. For illustration purpose, the project is only focusing on computer science diploma subjects from SAS (School of Art and Science) in Kuala Lumpur Main Campus and Johor Branch Campus.

In general, the major functionality of SETS is to serve as a platform to facilitate collaboration among Registrar and ARs from exam department and Bursar and ABs from financial department in different campuses through the process of registration for resit and repeat papers, billing, payment and releasing of the total number of resit and repeat students for each subject.

Besides that, billing and tracking payment status will be in-charged by financial department's Bursar and ABs, and they are responsible to update the payment status into the system. The duty of exam department's Registrar and ARs such as setting exam timetable, invigilators duty schedule and printing of exam slips are not included in this project.

In fact, they are four groups of users within this system: students, Registrar Group (exam department's Registrar and ARs), Bursar Group (financial department's Bursar and ABs) and Communication Information Technology (CIT) Center delegate staff. Students are able to register online and print out their registration form as copy of evidence (which include the starting date that students can collect their supplementary exam bill and the period of time allows for them to make their payment).

After that, Bursar Group can issue the supplementary exam bill (either by register post or hand on to students) based on registration information given by the students. Besides that, the Bursar Group is also responsible to send reminder

message (by email) three days before the due date of payment for students that have not settled their supplementary exam bill yet.

Students can make their payment at any Public Bank counter or through the PBeBank.com (online payment) or bursary counter (bank draft or cash less than or equal to RM100). As constrained by TARC's policy, if possible, all payment more than RM100 better be made payable to Public Bank. CIT Center delegate staff will be updated the bank payment on next working day, while Bursar Group will be updated the bursary payment everyday.

On the other hand, Registrar Group can retrieve the total number of resit and repeat students for each subject at the end of registration period by click of a button. This information (in report form) will serve as input to the Exam Scheduling System. At the same time, analysis of overall campuses is allowed through the use of this system.

Main Module	Major Functionality
1) Registration	<ul style="list-style-type: none"> ❖ Validate the total number of resit and repeat subjects (which the addition of main, resit and repeat subjects is less than or equal to 7 subjects). ❖ Print out the confirmation slip (which includes the total payment amount). ❖ Display the information which includes the starting date that students can collect their supplementary exam bill and the allowable period to make their payment).
2) Update Payment Status	❖ Update the payment status of students.
3) View Summary	❖ View the registration and payment summary.
4) Send Reminder Message	❖ Enable the college to send the reminder message (by email) three days before the due date of payment for students that have not settled their supplementary exam bill yet.
5) View Report	❖ View and print out the reports: Students Registration Report and Students Payment Report.

Table 1.1: Overall Functionalities of SETS.

The raw data such as subjects' code, name and details; students' ID number, IC number, name and details; Registrar and ARs' staff ID number, IC number, name; Bursar and ABs' staff ID number, IC number, name and so forth, which is used in developing the SETS system will be the combination of actual data as well as some simulation data that is based on the author's hands-on working experience at TARC.

To develop the SETS system, the following list of software will be utilized.

- 1) **Operating System** → Laptop with Microsoft Windows XP Professional 5.1.
- 2) **Web Browser** → Internet Explorer 6.0 is used to view and display the contents of the Web pages.
- 3) **Internet Information Services (IIS)** → IIS 5.1 includes a broad range of administrative features for managing Web sites and Web server.
- 4) **Microsoft Word** → Microsoft Word 2003 is required to assist in preparing the documentation of the project.
- 5) **Microsoft SQL Server** → Microsoft SQL Server 2005 is required to serve as a database for the SETS system.
- 6) **Microsoft Project** → Microsoft Project 2003 is utilized to plan and track the schedule for the SETS system.
- 7) **Microsoft Visio** → Microsoft Visio 2003 is utilized as a diagramming program that allows the author to draw the Unified Modeling Language (UML) diagrams.
- 8) **Programming language** → ASP.NET programming language is the core programming language that is used in developing the SETS system.

- 9) **Microsoft .Net Framework SDK v2.0** → The software is needed to support ASP.NET programming application development. The software can be downloaded free from the Internet (<http://www.microsoft.com/downloads/>).
- 10) **Microsoft Visual Studio .NET 2005** → The software is one of the most powerful ASP.NET compilers.
- 11) **Macromedia Flash MX** → The software is needed to generate animation files.

As SETS is developed based on web-based approach, the system will be developed using Rational Unified Process (RUP) that advocates Object-Oriented Methodology (OOM) in system implementation and modeled by using Unified Modeling Language (UML). Once the system is developed, a plan for beta and acceptance testing will be produced.

1.6 Importance of Project

From the proposed system – SETS, students, Registrar Group and Bursar Group of TARC are the three major groups of people who will benefit from the system.

When compared to the current system, the proposed online system solution will provide the easiest, fastest and most efficient way that allows collaboration among students, Registrar Group and Bursar Group in different campuses (by 24 hours and 7 days a week basis). Through the proposed system, it enables the Registrar and ARs from exam department of different campuses to reduce their tedious workload in collecting, checking and entering the data from registration forms into computer.

This system also enables the Bursar and ABs from financial department in main campus to produce the supplementary exam bills immediately after the registration period, which previously needs to wait for Registrar and ARs from exam department to enter the data from registration forms into computer.

In short, the proposed SETS system is significant to TARC as it brings benefits to the students, Registrar and ARs from exam department, and Bursar and ABs from financial department in information collaboration and sharing. As a result, these contributions can then further enhance the college efficiency and effectiveness in delivering better customer services to students as well as increasing the reputation of TARC.

1.7 Chapter Summary

The chapter has provided an overview on the proposed system – SETS, which is an online system solution that customized to TARC's existing circumstances. Based on the chapter, a reader can have a understanding on the problem statement, objectives, scope and importance of the proposed project.

In general, SETS is a solution that will serve as a medium to allow different campuses' students, Registrar and ARs from exam department, and Bursar and ABs from financial department to collaborate with each other. It facilitates information sharing and management among the Registrar and ARs from exam department and Bursar and ABs from financial department in different campuses.

In addition, SETS is developed to provide a channel that allows better customer services to students of TARC. Students are empowered to register their resit and repeat paper(s) by themselves (in error free manner). Furthermore, students can know the exact starting date to collect their supplementary exam bill, the allowable period to make payment and receive their exam timetable earlier if compares to the previous time.

In short, the SETS system serves as a platform for collaboration in exam management affairs among the students and Registrar and ARs from exam department, and Bursar and ABs from financial department of TARC.