DEVELOPMENT OF SCHOOL BASED ASSESSMENT MANAGEMENT SYSTEM FOR ICT SUBJECT (SBAMS4ICT)

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ABSTRAK

Subjek *Information and Communication Technology* (ICT) telah diperkenalkan oleh Bahagian Pembangunan Kurikulum (BPK) pada 2006. Subjek ini ditawarkan sebagai subjek elektif kepada calon yang akan menduduki peperiksaan Sijil Pelajaran Malaysia (SPM). Lembaga Peperiksaan Malaysia (LPM) merekabentuk instrumen pentaksiran berdasarkan sukatan pelajaran yang dihasilkan oleh BPK. Pembangunan instrumen pentaksiran ini adalah berdasarkan jadual piawaian spesifikasi bagi menjamin kualiti dan standard, begitu juga kesahan dan kebolehpercayaan bagi skor ujian yang diberikan. Walaubagaimanapun, pengurusan rekod pentaksiran oleh pentaksir di peringkat sekolah adalah masih menggunapakai kaedah manual. Pentaksir perlu mangisi data yang sama dalam borang-borang yang berlainan. Rekod-rekod tersebut perlu diletakkan di dalam 'fail cincin' (portfolio pelajar), dan ditempatkan dilokasi yang berkunci dan selamat. Apabila diperlukan, guru (pentaksir), pentadbir sekolah atau pelajar (calon) perlu mendapatkan portfolio tersebut terlebih dahulu sebelum sebarang rujukan boleh dilakukan. Pendekatan ini sememangnya meningkatkan bebanan kerja pentaksir, kemungkinan kesilapan dalam merekod data, memakan masa, rekod yang tidak dikemaskini, serta beberapa kelemahan lain lagi. Atas dasar ini, projek ini dicadangkan dan prototaip bagi Sistem Pengurusan Pentaksiran Berasaskan Sekolah Bagi Subjek *ICT* telah dibangunkan. Keperluan sistem telah dikenalpasti dan pembangunan prototaip menggunapakai Metodologi Pembangunan Sistem Agile. Fungsi prototaip telah diuji dengan menggunakan kaedah skrip ujian. Penilaian sistem dilaksanakan dengan menggunakan instrumen PUEU bagi mendapatkan tanggapan pengguna bagi aspek kepentingan sistem dan aspek mudah untuk digunakan. Sistem ini membolehkan pentaksir menguruskan rekod pentaksiran dengan lebih mudah berbanding pendekatan secara manual. Pentadbir sekolah mampu memantau prestasi pelaksanaan pentaksiran. Manakala pelajar pula akan dimaklumkan status terkini prestasi pentaksiran mereka melalui email yang telah didaftarkan.

ABSTRACT

Information and Communication Technology (ICT) has been introduced by Curriculum Development Division (CDD) as a subject in 2006. This subject is offered as an elective subject to candidates who are taking the Sijil Pelajaran Malaysia (SPM) examination. The Malaysia Examinations Syndicate (MSE) designed the assessment instruments based on the syllabus released by the CDD. The development of these assessment instruments is based on the standard table of specification to maintain the quality and standard, as well as the validity and the reliability of these test scores. Anyhow, the management of the assessment records by assessor on ground is still on manual effort. Assessor need fill in same data into different forms. Records need to be bind in a ring file (student's portfolio), and placed in the locked and secured place. Whenever needed, teacher (assessor), school admin or students (candidates) need to get the portfolio first and then do a reference. Increase assessors' workload, tendency to writing error, time consuming, not updated records, a few to mention the weakness of this approach. For that regard this project is proposed and the prototype of School Based Assessment Management System for ICT Subject has been developed. The requirements needed have been identified and the prototype development has employed Agile System Development Methodology. The functionalities of the prototype have been tested by using a Test Script method. System evaluation has utilized Perceived Usefulness and Perceived Ease-of-Use instruments. The system prototype has enable assessors to manage assessment records easily compared to manual approach. School admins would have capability to monitor the assessment progress. Students will have a copy of their progress notified through email.

ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

1.1   Background

In line with the implementation of the teaching and learning of Science and Technology subjects in English, the Curriculum Development Division (CDD) introduced Information and Communication Technology (ICT) as a subject in 2006. This subject is offered as an elective subject to candidates who are taking the Sijil Pelajaran Malaysia (SPM) examination.

The introduction of ICT as an elective subject in Malaysian secondary schools provides a valuable training ground for students (Curiculum Development Division, 2006). The curriculum helps students relate their ICT learning experiences to a progressive technology-based daily life and provides a platform for producing a technologically capable work force. This subject is offered to all Form 4 and Form 5 students. It aims to provide them with the knowledge, skills and values from several

designated learning areas. It will also prepare them for the Sijil Pelajaran Malaysia (SPM) examination.

The Malaysia Examinations Syndicate (MES) designed the assessment instruments based on the syllabus released by the Curriculum Development Division (CDD) (Malaysia Examination Syndicate, 2007). The development of these assessment instruments is based on the standard table of specification to maintain the quality and standard, as well as the validity and the reliability of these test scores.

Coursework assessment must be completed within the stipulated time set by the Malaysia Examinations Syndicate. Candidates are required to plan and carry out their coursework under the guidance and supervision of their assessors. Undue assistance from any other person. Assessors must verify candidates' coursework using appropriate forms provided. Monitoring by external verifiers will be carried out within the duration during which the coursework is being implemented. Internal verifier will verify the implementation of the coursework. The score then will be sent to State Education Department. The school Examination Secretary will enter the score into MES portal. Schools must keep these forms for at least six months after the announcement of the SPM results. All coursework must be kept according to procedure and specification. Schools must provide a suitable place to keep the candidates' documents. Normally, the documents will be placed in the locked cabinet and located in the computer laboratory. Schools are responsible to provide all the equipment, such as ring files, papers, CDR, crimping tools, UTP cable (Cat 5e), and cabinet, and facilities, such as computer software and hardware, which necessary for

the candidates to complete their coursework (Malaysia Examination Syndicate, 2007).

1.2 Problem Statement

The aims of the Information and Communication Technology curriculum at the school level are to provide students with knowledge and skills in ICT, to enable them to solve problems and make informed decisions in everyday life based on positive attitudes and noble values, and to develop concerned, dynamic and progressive individuals with an ICT culture that values knowledge and ethics towards the technological advancement of the nation (Curiculum Development Division, 2006).

Assessors are those who are teaching an ICT subject. They are responsible in managing the records related to the subject. In managing students' coursework assessment records, assessors must fill the score for every aspect assessed in the following forms: (1) Assessment Checklist Form (ACF), (2) Individual Score Form (ISF), and (3) Batch Score Form (BSF). Then, the external verifier must verify candidates' coursework using the provided forms for products and reports (ISF) (Malaysia Examination Syndicate, 2007). Assessor must submit candidates' coursework portfolio and completed assessment forms, ISF and BSF to the internal verifier. On manual effort, it could lead to increasing assessors' workload, tendency to writing error, time consuming and not updated records.

(Norma, A., personal communication, February 22, 2012) said, until now, there is no such system provided by Malaysia Examination Syndicate to help assessors in managing ICT Assessments' records. (Zabidah, S., personal communication,

February 22, 2012) added, mostly, assessors use their own approach in managing students' assessment records and progress. Application software, such as Microsoft Office Word or Excel is among the prominent tools used in managing those records. This statement agreed by (Suhaidi, S., personal communication, February 23, 2012) and he explained that, the application files created mostly suit the author's need, not fitting to other assessors' needs. So, possibly, everybody has their own tools to help them manage the records.

Candidates don't have a copy of their progress on coursework assessment since the documents need to be securely stored by assessor (Husniza, H., personal communication, February 24, 2012). So, candidates won't be able to have an official copy of their coursework assessment's progress. It's a hectic whenever assessors or students need to refer to the records; they need to access the record manually, since it's located on locked and secured place.

School administrator, as an internal verifier only have a chance to monitor assessment progress based on report provided by assessors during curriculum meeting. When it comes a time for them to verify the ISF and BSF, it's too late for them to comment or give any opinion (Norazman, M., personal communication, February 24, 2012).

UNESCO (2009), in their Technical Paper No. 2 stated, technologies can improve the teaching/learning process by reforming conventional delivery system, enhancing the quality of learning achievements, facilitating state-of-the-art skills formation, sustaining lifelong learning and improving institutional management. Based on the

statement, it's clear that the utilization of technology in managing the ICT coursework assessment records would deliver the enhancement in learning environment.

1.3 Research Question

In order to achieve the project objectives, several question need to be answered. The questions are:

Table 1.1: Research Questions

Question	Method	Focus
What are the requirements needed in this management system?	Literature review. Interview. Document review.	Identify the requirement for assessment management system.
How to develop a management system?	Methodology.	Developing an assessment management system.
How to test the management system?	Test method.	Test the functionality of the management system using Test Script method.
How to evaluate the management system?	Evaluation method	Evaluate the system using Perceived Usefulness and Perceived Ease-of-Use instruments.

The first question is about the requirements needed in this management system. There are a few method could be implemented in order to gain the requirements. As for this project, three (3) methods have been used. There are literature review, interview and document review.

The second question is focusing more on how to develop the intended management system. In order to answer this question, some methodologies have been reviewed to support the development process of this management system. As a result, the development of this management system has been divided into three (3) phases;

planning, application development and, evaluation. This methodology was so helping in proving a path in developing this management system.

Third question raised an issue on how to test the developed management system. The prototype of management system can be tested by using several testing methods. The main focus and purpose of the testing is to know the functionality of the developed system. To answer this question, a Test Script method has been used to test the functionality of the developed management system prototype.

The last question looks on how to evaluate the developed management system. There are a few ways to evaluate the developed management system, anyhow, as for this project, Perceived Usefulness and Ease-of-Use Instrument (PUEU) instruments has been used to evaluate users' perceive on this management system prototype. This instrument was focusing on the usefulness of the system and ease-of-use of the system as well.

1.4   Research Objectives

The main objective of this project is to develop a selected features prototype for a School Based Assessment Management System for ICT Subject. In order to achieve this objective, the following specific objectives have been defined:

1.4.1   To identify the users' requirements in developing a prototype of School Based Assessment Management System for ICT Subject.

1.4.2   To develop a prototype of School Based Assessment Management System for ICT Subject.

1.4.3   To test the functionality of School Based Assessment Management System for ICT Subject prototype using Test Script method.

1.4.4   To evaluate the prototype of School Based Assessment Management System for ICT Subject using Perceived Usefulness and Perceived Ease-of-Use instruments.

The first objective is to identify the users' requirements in developing a prototype of School Based Assessment Management System for ICT Subject. This is the most important step in developing any management system. Requirements need to be identified first before any development steps could be executed. As for this project, requirements have been identified by using several methods; there are literature reviews, interview and document review. The review on the literature has been implemented on the past research, system, technology and methodology related to management system. While, interview involved the effort on asking the right person involved in the ICT coursework assessment records management. As for that intention, an interview has been conducted with those who have a direct involvement in managing candidates' coursework assessment records. A few assessors from schools offering ICT subject have been selected for this purpose. Coursework Assessment Manual for ICT has been used as a major reference for a document review method. This manual contains guidelines, procedures and assessment forms for the implementation and assessment of the coursework to be carried at school level.

To develop a prototype of School Based Assessment Management System for ICT Subject is the next objective has been achieved. To develop this management system prototype, the suitable methodology needs to be used. There are several methodologies that are available in the field. To find the most suitable methodology,

time and the requirements need to be considered before the development taking the place. As for this project, selected features prototype has been chosen as the prototyping type to be developed. Selected features prototype concerns building an operational model that includes some, but not all, of the features that the final system will have (Kendall & Kendall, 2011). Some essential features are included. Users' feedback helped in identifying what was working and what was not. It also helped with suggestions on what features to be added next.

Third objective is to test the functionality of the developed prototype of School Based Assessment Management System for ICT Subject by using a Test Script method. Testing is done to determine the functionality of the developed prototype. Testing could be done through several methods. As for this project, the Test Script distributed to the target user before they were requested to test the functionality of the system prototype. Users' feedbacks were used to rectify any error detected in term of functionality.

Lastly, the developed prototype for the School Based Assessment Management System for ICT Subject needs to be evaluated. So, the objective is to evaluate the prototype of School Based Assessment Management System for ICT Subject using Perceived Usefulness and Perceived Ease-of-Use instruments. This method is used to determine the usefulness and the acceptance of the user towards the prototype. As for this purpose, the PUEU test develop by Davis (1989) been utilized.

1.5   Scope

The explanation of this part will be divided into research scope and system scope.

1.5.1 Research Scope

The project is purposely for the students' coursework assessment for the ICT subject in Kedah secondary school. Problem identification has been implemented through an interview with selected assessors from school offering ICT subject in state of Kedah. Documents review has been implemented on Coursework Assessment Manual for ICT Subject (3765/2) which provided by Malaysia Examination Syndicate.

The prototype were developed using an Agile Development Methodology. ASP.Net, VBScript, JavaScript, Microsoft Visual Web Developer 2010 Express, Microsoft SQL Server 2008 Management Studio, Windows Live Mail 2011, Mozilla Firefox web browsers are among tools been used to develop the management system prototype.

This project covered these development phases only; Analysis, Design, Development of the Prototype. Deployment phase was not being implemented since the project was focusing on developing prototype on local host. So, no physical server testing was conducted.

Additionally, this selected features prototype concerns building an operational model that includes some, but not all, of the features that the final system will have. Only some features are really highlighted in this prototype development. Even the development was focusing more on assessors' utilities, since this system intentionally to assist assessor in delivering their task, there were also utilities for administrator and school admin as well, but limited. The functionality of the prototype had been tested using Test Script method.

Then, the evaluation has been carried out using Perceived Usefulness and Perceived Ease-of-Use instruments to evaluate users' perceive toward the system. Twenty evaluators consisting assessors, school admins and administrator were randomly selected to perform this evaluation.

1.5.2 System Scope

Although the system is intended to provide a useful management system for assessor in managing students' assessment record, some other users are also considered as those who will get the benefit from the development of this system. There are three group of users are able to access the system; Administrator, School Admin and Assessor.

Administrator is responsible to create School Admin's account for each school offering ICT subject; and managing the users and schools records. The username for School Admin is utilizing a school code since it's uniquely identifying each school's record.

School Admin access the system by using the created account and will be able to monitor the ICT assessment progress of their school. Furthermore, the individual detail progress of the student could be printed out.

Assessor need to register in order to make a use of the system. Upon registration, the system will automatically approve the assessor. Anyhow, assessors are only able to make a full use of the system after their role been assigned by an Administrator.

Assessor's role provides a capability to the assessors in managing their students' details and scores.

The system prototype is capable to generate Individual Score Form (ISF), Batch Score Form (BSF), Record of Submission (ROS) and Coursework Portfolio (CWP) based on record entered by the assessor. Assessment Checklist Form (ACF) and Report Form (RF) are excluded from system management since these forms are considered as evidences which need to be filled in by handwriting.

The system prototype enables assessors to send notification email to their students regarding assessment progress update. As for this prototype, the email is send to a local host repository. Administrator is capable to assign students to other assessor whenever students transfer to another school in Kedah which offering ICT subject as well.

1.6   Significance of the Project

SBAMS4ICT is intended to help assessors in performing their task instead of utilizing manual effort in managing coursework's assessment record which is prominently known have lots of weaknesses. Furthermore, school admin will be able to continuously monitor the progress of the assessment implemented by assessors and students. As for students, their assessment update will be able to be notified through their registered email. Since there is no management system been developed to manage ICT Assessment's records, this project could be made as a reference for any organization intended to develop similar system.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section review some theories, concepts and findings from previous studies that are available in the literature regarding the subject. The latest technologies related to this project also reviewed in this section.

2.2 Agile Methodology

Agile development methodology is a software development method attempting to offer an answer to the eager business community asking for a lighter weight along with faster software development process (Pekka, Outi, Jussi, & Juhani, 2002).

Agile methods are the newest development approach, and attempt to develop a system incrementally by building a series of prototypes and constantly adjusting them to user requirements (Shelly & Rosenblatt, 2012). An agile approach emphasizes continuous feedback, and each incremental step is affected by what was learned in the prior steps. The agile approach is a software development approach

based on values, principles, and core practices. The four values are communication, simplicity, feedback, and courage (Kendall & Kendall, 2011). Agile development methodology promotes adaptive planning, evolutionary development and delivery; time boxed iterative approach and encourages rapid and flexible response to change (adappt, 2011). It's a conceptual framework that promotes foreseen interactions throughout the development cycle.

The Agile Software Development paradigm has become increasingly popular in the last few years, since it claims lower costs, better productivity, better quality and better business satisfaction (Mishra & Mishra, 2011). Agile software methodologies are quickly becoming widely used in a variety of industry projects; their flexibility provides the means to address many common problems faced in the development of software systems such as budget, schedule and availability of skilled developers. This is in sync with the philosophy of Agile Methods which states software should be developed in an incremental and iterative way with high priority requirements to be included in initial releases and working software is seen as a sign of progress.

Agile development relies on the collaborative efforts of everyone involved in the development of the product (Dinakar, 2009). Working software is underlined as the most tangible yardstick of the state of the product.

Based on the advantages delivered by Agile Development Methodology, it's been adapted in to this system development. Since agile is the best methodology for the fast system development, it suit with the limited time available for this prototype development. Furthermore, the quality of the system is not compromised. The

incremental and iterative development approaches are tremendously helpful when the requirements could be changed at any time during the development phase. And, the best part is, the collaboration between every single person involved in this development, including developer and users is the tight relation in delivering a meaningful management system.

2.3   Selected Features Prototype

The term prototype means an early model of a product in development for better understanding. The prototypes helps in better understanding of the product which is yet to be developed, it also helps in understanding the functionalities of the actual product may perform, the way real product should look, feel and many other related things (Yasar, 2007). Prototyping methods are widely recognized as an important component of the Human-Computer Interaction process. When correctly applied, the ability of a prototype to identify and correct potential problems early in the development cycle can pay for the cost of the prototype many times over.

Prototype is a rapidly construct working version of the proposed information system (Shelly & Rosenblatt, 2012). Information gathered in the prototyping phase allows the analyst to set priorities and redirect plan inexpensively, with a minimum of disruption.

Selected features prototype concerns building an operational model that includes some, but not all, of the features that the final system will have (Kendall & Kendall, 2011). Some essential features are included. User feedback can help analysts

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understand what is working and what is not. It can also help with suggestions on what features to add next.

This management system is purposely to be mostly used by an assessor in managing students' coursework assessment records. Anyhow, in order to maintain the users' account there is a need for administrator availability for the system to be well functioning. As for the purpose of progress monitoring at the school level, school admins have a capability to view the assessment progress for their respective school. By developing selected features prototype, functional requirements for the system are focusing more on assessor. Only a limited function been developed for the administrator and school admins.

2.4   Coursework Assessment for ICT

Coursework assessment for ICT subject is an on-going process throughout the teaching and learning process. Assessment will be carried out when both parties (candidate and assessor) are prepared/ready within the stipulated time. The assessor should consider giving opportunities for candidates who request for re-assessment. Re-assessment should be carried out to improve the performance score of any aspect (Malaysia Examination Syndicate, 2007).

The teacher's role as an assessor is to assess the performance of a candidate during assessment. The assessor must prepare the assessment schedule agreed by both assessor and candidate. The assessor is required to administer and manage scores and records (Malaysia Examination Syndicate, 2007). All coursework must be completed by July of the examination year. The assessor must fill the score for every aspect

assessed in the following forms: (1) Assessment Checklist Form (ACF), (2) Individual Score Form (ISF), and (3) Batch Score Form (BSF). Assessor must submit candidates' coursework portfolio and completed assessment forms ISF and BSF to the internal verifier. The external verifier must verify candidates' coursework using the provided forms for products and reports (ISF). Assessor must keep candidates' coursework portfolio in a safe place. Normally, it will be placed in the locked storage located in the school computer laboratory. Whenever student transfer to other school, internal verifier must ensure that the candidate's assessment portfolio is sent to the candidate's new school when he/she goes on transfer. The scores for each candidate will be entered online by the Examination Secretary based on the Individual Score Form.

2.5   Management Information System

A management information system (MIS) provides information which is needed to manage organizations efficiently and effectively (OCC, 1995). Management Information Systems (MIS) can be used successfully to facilitate access to a wide range of integrated data sets (Geerders, 2004). Different types of information systems serve different functions and can be generally categorized based on the level of a system's complexity and the type of functions it serves. In recent years the capabilities of many applications have been combined and merged. As long as a system supports one or more than one activities, it may be referred to as a management information system (MIS) (Oz, 2009).

MIS are computerized information systems that work because of the purposeful interaction between people and computer (Kendall & Kendall, 2011). To access

information, users of the management information system share a common database. The database stores both data and model that help user interact with, interpret, and apply that data.

Web-based application management system allows a user to access independent Web resources indirectly, through a semantic layer, whose role is to integrate several information resources about the same or similar domains (Gal, 2001). The availability of web-based application management system will enable the utilization of the management system at anywhere and anytime.

ICT provides support to learning, teaching, administrative and management processes within the education system (Salbiah, n.d). The Ministry of Education Malaysia has formulated three main policies in education: ICT provided to all students as an enabler to reduce the digital gap between schools, ICT in education as a teaching and learning tool, as part of a subject and as a subject by itself, and using ICT to increase productivity, efficiency and effectiveness of the management system.

Based on the policy formulated by Ministry of Education, this management system could provide an increment in productivity, efficiency and effectiveness in assessment's record management by the assessors. The integrated data could be manipulated and reviewed by registered and authorized users centrally. Assessor would be able to manage the assessment records anytime and anywhere. This is crucial when assessors are out of the station and at the same time needs for refer to the records. Students would be able to have a copy of their progress stored on their registered email account.

2.6   Record Management

Records management is the practice of maintaining the records of an organization from the time they are created up to their eventual disposal. A record can be either a tangible object or digital information (Wikipedia, Record Management, 2012). Records contain information that is a valuable resource and an important business asset. A systematic approach to the management of records is essential for organizations and society to protect and preserve records as evidence of actions. Records represent evidence of past processes, actions and decisions, contributing to knowledge sharing and decision support (Viera, Borbinha, & et al, 2011)

Since the assessment records are the crucial records which could reflect the students' SPM result, its need to be carefully maintained and stored. Assessors need to practice a great record management technique in order to protect and preserve records as an evidence of actions. The development of School Based Assessment Management System for ICT Subject is intended to cater and assist assessors in term of the needs for reliable record management practice.

2.7   Human-Computer Interaction

In recent years, the study of human–computer interaction (HCI) has become increasingly important for systems analysts. Although the definition is still evolving, researchers characterize HCI as the "aspect of a computer that enables communications and interactions between humans and the computer" (Zhang, Carey, Te'eni, & Tremaine, 2005). Analysts using an HCI approach are emphasizing people rather than the work to be done or the IT that is involved. Their approach to a problem is multifaceted, looking at the "human ergonomic, cognitive, affective, and

behavioral factors involved in user tasks, problem solving processes and interaction context" (Zhang, Carey, Te'eni, & Tremaine, 2005).

As for this project, human-computer interaction moves away from focusing first on organizational and system needs, instead concentrates on human needs. This project adopting HCI principles examine a variety of user needs in the context of humans interacting with information technology to complete tasks and solve problems. These include taking into account physical or ergonomic factors; usability factors that are often labeled cognitive matters; the pleasing, aesthetic, and enjoyable aspects of using the system; and behavioral aspects that center on the usefulness of the system.

Another way to think about HCI is to think of it as a human-centered approach that puts people ahead of organizational structure or culture when creating new systems (Kendall & Kendall, 2011). This management system provides an ample space for assessor in managing their students' coursework assessment records.

2.8 Similar System

There is some management systems currently being used in order manage records related to education in Ministry of Education.

2.8.1 SAPS (Sistem Analisis Peperiksaan Sekolah)

The SAPS or better known as the Online School Examination Analysis System has been launched on July, 2011. The SAPS was launched by Ministry of Education as one of the efforts to centralize the examination results from all the states (Online Communities, 2011). Initially, there were critics on the system capability during

heavy traffic. In fact, it was reported that teachers have found it to be counter-productive as they have to wait for hours to key in the data. Improvement of the system gradually implemented.

2.8.2   SGM (Standard Guru Malaysia)

Standard Guru Malaysia (Malaysia Teachers' Standard) outlined the professional competencies should be achieved by teachers, and requirement should be provided by teacher's training agency and institutional (Bahagian Pendidikan Guru, 2012a). Questionnaire is used to retrieve instrument on current standard of teacher in Malaysia. The purpose of the system is to help teacher in achieving standard competency level. To improve the effectiveness of the system, record will be regularly revised.

2.8.3   SPLG (Sistem Pengurusan Latihan Guru)

SPLG (Teachers Training Management System) developed to record courses attended by teachers and educational staff (Bahagian Pendidikan Guru, 2012b). Previously, the record management were on manual basis where teachers need to fill in 'Kad Latihan Dalam Perkhidmatan', also known as Blue Card (derived from the color of the card), and will be kept by school clerk. The online system is intended to collect the data faster, accurate and efficiently. The system also providing a space for teachers to suggest the need for training they should have. This effort has been implemented through a collection of online questionnaire in the system (Bahagian Pendidikan Guru, 2012b).

2.9 Conclusion

From all the literature, it could be concluded that utilization of web-based management system in managing students' assessment records could assist assessor in their task implementation. Furthermore, it's synchronized with the ministry's policy in term of exploiting the capability of ICT itself. It would be helpful whenever the records need to be always updated and carefully maintained, since it reflecting students' SPM result. With the help of the technology, there is always a new element to be manipulated in order to make the record management at ease.

CHAPTER 3

METHODOLOGY

This chapter reviewed the methodology used in order to achieve the objectives stated. It covered the explanation about the theory, tools and other resources used in the development process of the prototype.

3.1 Introduction

The Methodology that is used in the prototype development was an adaptation from (Denis, Wixom, & Tergarden, 2007), (Kendall & Kendall, 2011) and (Shelly & Rosenblatt, 2012). Phase 1 is more on planning, second phase focusing on application development, and the last one is intended for system evaluation purpose. In every phase, there was/were stage(s) been implemented. Figure 3.1 shows the research methodology for School Based Assessment Management System for ICT Subject development. Meanwhile, Figure 3.2 shows the research framework for the system.
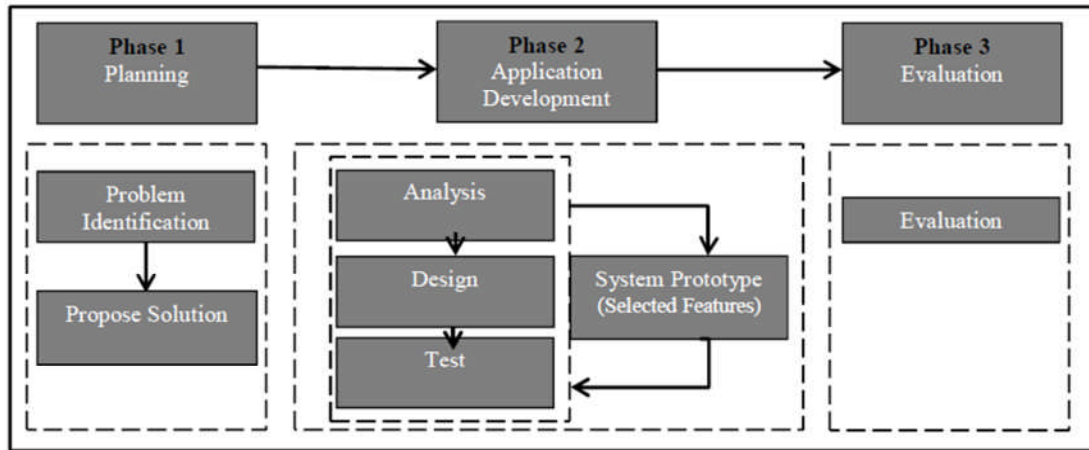
Figure 3.1: Research Methodology for SBAMS4ICT. Adapted from (Denis, Wixom, & Tergarden, 2007)*,* (Kendall & Kendall, 2011) *and* (Shelly & Rosenblatt, 2012)
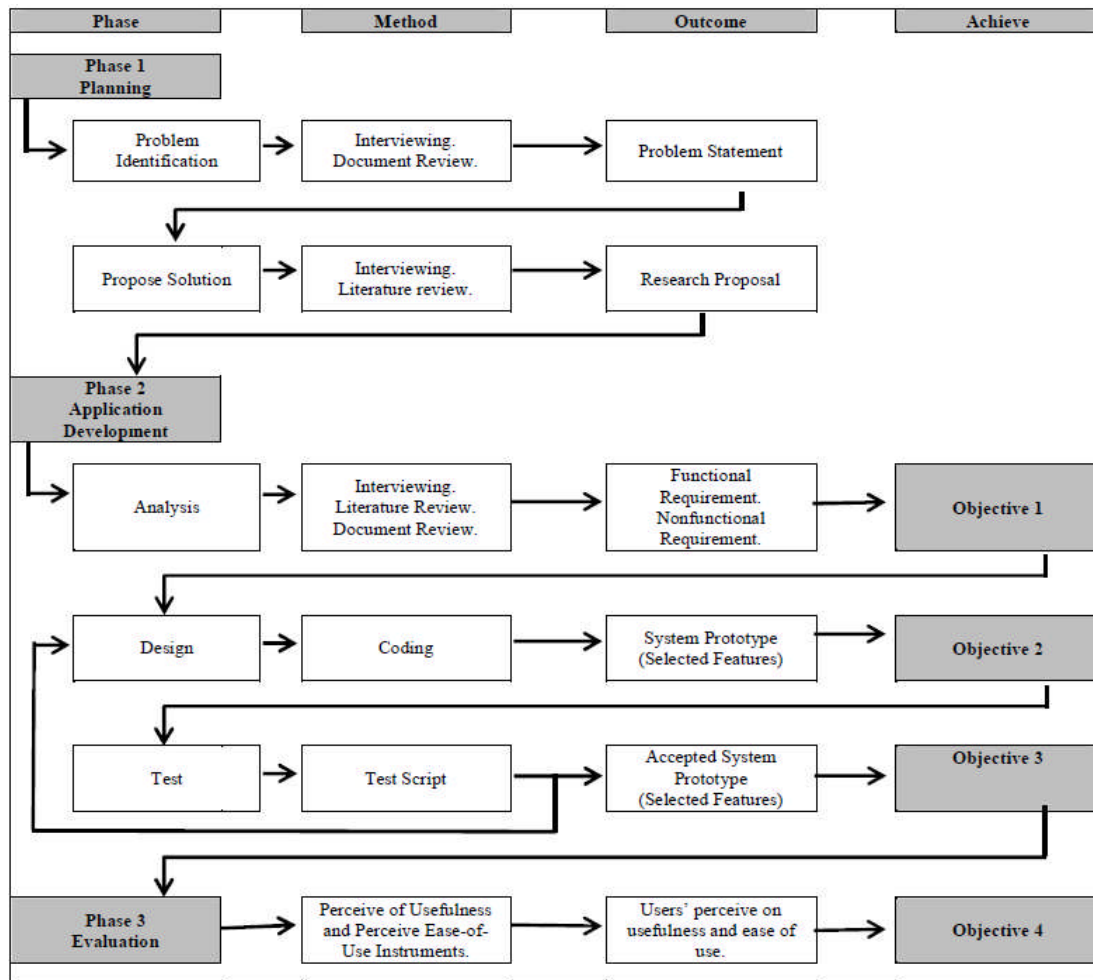

Figure 3.2: Research Framework for SBAMS4ICT. Adapted from (Denis, Wixom, & Tergarden, 2007)*,* (Kendall & Kendall, 2011) *and* (Shelly & Rosenblatt, 2012)

3.2 Phases

3.2.1 *Phase 1: Planning*

In this phase, the problems that arise in the real situation have been identified. The purpose of this phase is to perform a preliminary investigation to evaluate an opportunity or problem (Shelly & Rosenblatt, 2012). Then the problem statement of the current situation has been generated. Based on the problem statement, the solution been proposed by considering the input from interviewing and literature review related to the system. The research proposal provides a blueprint of the project.

3.2.1.1 *Problem Identification*

Problem identification used interviewing and document review method. Based on the problem identification methods, the statement about the problem faced by the current system has been generated. The problem statement could be reviewed on Chapter 1.

3.2.1.1.1 Interviewing

An information-gathering interview is a directed conversation with a specific purpose that uses a question-and-answer format. In the interview, the intention is more on getting the opinions of the interviewee and their feelings about the current state of the system, organizational and personal goals, and informal procedures for interacting with information technologies (Kendall & Kendall, 2011).

This interviewing method used to gather information about the current manual assessment management system implementation. The assessors of ICT subject have

been interviewed to get a brief understanding about the manual flow and the problems they frequently faced. During interviewing session, their emotion also been taken into consideration. Sometimes their expression during describing how manual record management been implemented showing their dissatisfaction on data redundancy, where they need to transfer the same data into different forms.

3.2.1.1.2   Document review

Document review can help us understand how the current system is supposed to work (Shelly & Rosenblatt, 2012). There is a need for obtaining copies of actual forms and operating documents currently in use. The review also should be implemented on blank copies of forms, as well as samples of actual completed forms.

An ICT Coursework Manual has been used as a main reference for the detail about ICT assessment procedure and flows. This coursework assessment document contains guidelines, procedures and assessment forms for the implementation and assessment of the coursework to be conducted at school level (Malaysia Examination Syndicate, 2007). Appendix 1 shows the current flow of assessment procedure and some of the forms used provided by Malaysia Examination Syndicate.

3.2.1.2   Propose Solution

When the problem been identified, through all the finding from the previous interview and document review, a solution for the problem crafted. The proposed solution considering the input from interviewing and literature review related to the system. School Based Assessment Management System for ICT Subject has been proposed as a solution for assessors in implementing their tasks.

3.2.1.2.1 Interviewing

Again, the interviewing method used to gather the wishing list of the assessors on the system capability which to be developed. Based on the input the feasibility study could be conducted to see whether it is worthwhile to move further (Shelly & Rosenblatt, 2012).

Assessors have been asked either they are agreed or not if there is a management system developed purposely for managing the students' assessment record. Their expectation on the management system mentioned also been recorded.

Based on the interview, the understanding on how the current system implementation has been grasped, and the idea on management system development has been provided as a suitable solution. Assessors' expectations on the new management system have been obtained as well.

3.2.1.2.2 Literature Review

Literature review can be defined as a summary of previous research on a topic by accredited scholars and researchers (Norshuhada & Shahrizan, 2010). It summarizes, interprets, and evaluates existing published materials in order to establish current knowledge of the subject. The explanation of some terminologies and technologies which will be used included as well.

The literature review has been implemented on previous study about the management information system, record management, human-computer interaction, and ICT Coursework Assessment Manual. The review on similar management system been

utilized within Ministry of Education have been done as well. Furthermore, the technologies need in developing and documenting the management system also been revised.

3.2.2   Phase 2: Application Development

In this phase, the analysis, design and testing of the system have been implemented. Tentative design is sketched and translated into program codes to build the logical design of the selected features prototype. Then the prototype is tested for its functionality. Errors found are rectified.

3.2.2.1   Analysis

The analysis sub phase gathered the requirement of the system, again by utilizing method of interviewing, literature review and document review. The iteration of interviewing method is basically to continuously getting the assessors feedback during development phase. This is part of Agile Development Methodology which concerning about the iteration in system development. As the result, the tentative design of the system been released. The tentative design includes the Unified Modeling Language (UML) diagram models. The UML diagrams involved are general use case diagram, detailed sequence diagrams for each use case, activity diagrams and class diagram. The UML, which is a standardized notation, is easy to use and understand, is used to model users' requirements. The Rational Rose 2002 Enterprise Edition software is used to construct the UML diagram.

3.2.2.2   Design

The tentative design has been converted into logical design using a development tools. .Net has been used as the development platform for this project. Microsoft Windows 7 operating system used to run the machine, Microsoft Visual Web Developer 2010 Express is used as web design application (IDE); Microsoft SQL Server 2008 Management Studio used to create and manipulate the data, Windows Live Mail 2011 is used as an email client, and Mozilla Firefox as the default web browser. ASP.Net, VBScript, JavaScript and SQL are among programming language used. As the result, the system prototype been developed. Users' feedback on the developed prototype been highlighted to improve the system.

The key advantage of a prototyping is that it very quickly provides a system with which the users can interact, even if it is not ready for widespread organizational use at first (Denis, Wixom, & Tergarden, 2007). Prototyping reassures the users could see the progress, and helps to more quickly refine real requirements. Rather than attempting to understand a system specification on paper, the users can interact with the prototype to better understand what it can and cannot do.

3.2.2.3   Testing

A Test Script in software testing is a set of instructions that will be performed on the system under test to test that the system functions as expected (Wikipedia, Test script, 2010). The Test Script has been conducted in assessor's school through on agreed appointment. Two (2) assessors have been involved in this testing sub-phase. One (1) of the selected assessor also the person who has been appointed by the Kedah State Education Department as a Kedah Chief Assessor for ICT Subject.

Meaning to say, she is the administrator of the developed management system as well. Testing also been conducted on school admins of the selected assessor's school. There were two (2) school admins involved. Since, the Test Script is purposely more on testing the functionality of the system, only these 2 personnel from SMK St. Michael, Alor Setar, and 2 personnel from SMK Guar Chempedak were affected. Based on the Test Script result, any errors have been rectified.

3.2.3   Phase 3: Evaluation

The evaluation of the system used Perceived Usefulness and Ease-of-Use instrument. Perceived Usefulness and Ease-of-Use been developed by (Davis, 1989). This test used to measure the component of usefulness and perceive ease-of-use of user acceptance. The questionnaire consists of demographic section and a section for twelve (12) questions with one (1) to seven (7) scaling. The question is divided into two parts, first part is about perceived usefulness and the second part is about perceived ease-of-use.

The evaluation phase took place in SMK Guar Chempedak, during a two (2) days briefing on the current year assessment implementation by Kedah State Education Department. Fifteen (15) assessors, four (4) school admins from a different school and one (1) administrator have been selected to evaluate the system developed. The questionnaire is distributed and they were using the system on their own under researcher's observation and guidance.

CHAPTER 4

APPLICATION PROTOTYPE DEVELOPMENT AND FINDINGS

This chapter will discuss on the application prototype development process. The development phases was adapting Agile Development Methodology where the iteration and users' feedback were taking into consideration. The requirement could be altered at anytime during development of the prototype. This chapter also discuss on the finding of the prototype.

4.1   Introduction

Development phase was an important part for this project. This part determine wheter the problem statement that has been stated in the ealier phase been answered or instead. In this phase, three (3) sub-phases involved; analysis, design and testing. This project looked deeper into every sub-phases. Every sub-phase has its own methods and outcomes as shown in Figure 4.1.
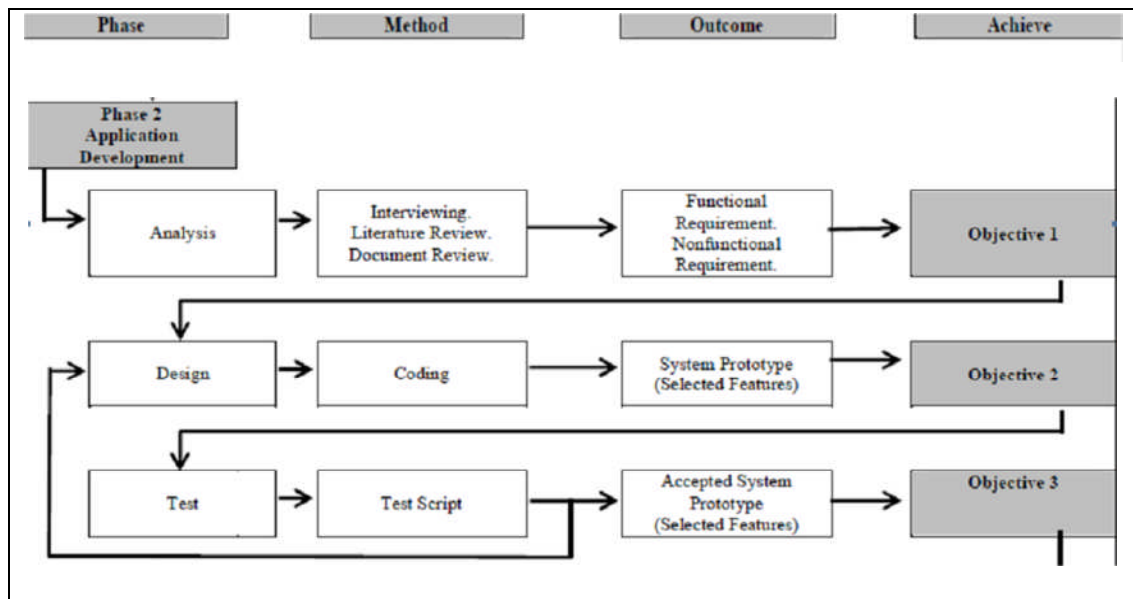
Figure 4.1: Extracted Research Framework for Application Development Phase

This figure shows the outcomes for every sub-phases in application development phase. There are three sub-phases; analysis, design and test.

Analysis sub-phase involving three (3) methods; interviewing, literature review and document review. The outcomes are user requirements, consisting functional requirements and non-functional requirements.

The second sub-phase for application development phase is designing. At this level, iterface design and coding is took place. The result, initial selected feature prototype for the intended management system released.

The developed prototype been tested using Test Script in order to verify the required functionalities. User involvement in providing a feedback through a Test Script enable researcher to rectify any errors detected. Finally, the accepted selected features prototype has been released.

4.2   Analysis

The purpose systems analysis sub-phase is to build a logical model of the new system. The first step was requirements modeling, where investigation on business processes and document been implemented in order to gather information on what the new system must do to satisfy users. To understand the system, fact-finding has been performed using three (3) methods; interviewing, literature review and document review. Fact finding results is used to build business models, data and process models, and object models. The outcome for the systems analysis sub-phase is the system requirements document. The system requirements document describes user requirements and outlines alternative development strategies.

4.2.1   Interviewing

Interviewing session been conducted informally during courses and briefing organized by Kedah State Education Department. This is the time where, all Kedah ICT Subject teachers gather and exchange any idea and discussing any issues related to ICT Subject in school.

The selection of the interviewee was based on their seniority in teaching ICT Subject in school. Head of Assessor for the Kedah and some senior assessors been selected for this purpose.

The follow up on interviewing session also been conducted. Anyhow, just a few assessors involved in the follow up interview due to the time constraints and assessors availability.

Based on interviewing session, researcher found that until now, there is no such system provided by Malaysia Examination Syndicate to help assessors in managing ICT Assessments' records. Mostly, assessors use their own approach in managing students' assessment records and progress. Application software, such as Microsoft Office Word or Excel is among the prominent tools used in managing those records. The application files created mostly suit the author's need, not fitting to other assessors' needs. So, possibly, everybody has their own tool to help them manage the records.

Furthermore, candidates don't have a copy of their progress on coursework assessment since the documents need to be securely stored by assessor. So, candidates won't be able to have an official copy of their coursework assessment's progress. It's a hectic whenever assessors or students need to refer to the record; they need to access the record manually, since it's located on locked and secured place.

School administrator, as an internal verifier only have a chance to monitor assessment progress based on report provided by assessors during curriculum meeting. When it comes a time for them to verify the ISF and BSF, it's too late for them to comment or give any opinion.

The implementation of coursework assessment management records on manual effort could lead to increasing assessors' workload, tendency to writing error, time consuming and not updated records.

When the assessors been raised about the web-based application, they were excitingly agreed to have this kind of management system since most of them already adhere with the capability of web-based application could deliver. They wish to have an easy to use management system which could minimize their workload on managing students' coursework assessment records. Mostly, on the needs for transfering the same records from one (1) form to another. They added, there should be a school admin login in order to let school admin monitor the progress as they want at any time and any where. So, they don't have to keep on asking the assessors about the current progress. On the student side, assessors want to have a capability to inform student's about their personal progress through students' email. The burden of keep refering on hard copy document whenever asked by students would be waved out.

4.2.2   Literature Review

The literature review has been implemented on previous study about the management information system, record management and human-computer interaction. The review on similar management system been utilized within Ministry of Education have been done as well.

Furthermore, the technologies and applications needed in developing and documenting the management system also been revised. Microsoft Visual Web Developer 2010 Express, Microsoft SQL Server 2008 Management Studio, Windows Live Mail 2011, ASP.Net 4, Visual Basic.Net, JavaScript and Mozilla Firefox web browser have been chosen as a development tools for this project. JavaScript, VB.Net and are SQL are among programming language used in this project.

4.2.3 Document Review

The major reference in document review is an ICT Coursework Assessment Manual which been provided by Malaysia Examination Syndicate. The review explained the steps need to be implemented by assessor in delivering their tasks. The assessor must fill the score for every aspect assessed in the following forms: (1) Assessment Checklist Form (ACF), (2) Individual Score Form (ISF), and (3) Batch Score Form (BSF). The external verifier must verify candidates' coursework using the provided forms for products and reports (ISF). Assessor must submit candidates' coursework portfolio and completed assessment forms, ISF and BSF to the internal verifier. Then, the BSF will be send over to State Education Department.

Following the guideline from the provided manual, the proposed solution has been sketched out without any adjustment on the standard stated by Malaysia Examination Syndicate.

4.2.4 Findings on Analysis Sub-Phase

Utilizing the input from interviewing session, reviewed literature and document, researcher has determined the requirements and came out with the requirement definition. The requirements definition defined what the system is to do (Denis, Wixom, & Tergarden, 2007). The requirement definition have been documented using UML notation by presenting list of requirement, use case diagram, use case specification, activity diagram, sequence diagram, and class diagram.

List of requirement consist of functional requirements and non-functional requirements. Table 4.1 shows a part of functional requirements for the system. Appendix 3 shows the details of the requirements.

Table 4.1: Part of Funtional Requirements

		A. FUNCTIONAL REQUIREMENTS	
No	Requirement ID	Requirement Description	Priority
	SBAMS4ICT_01	**Registration (Administrator and Assessor)**	
1	SBAMA4ICT_01_01	Administrator and Assessor could register for new account.	M
2	SBAMA4ICT_01_02	User could cancel the registration by clicking on home link.	O
3	SBAMA4ICT_01_03	Message will be prompted if a blank field detected.	M
4	SBAMA4ICT_01_04	Message will be prompted if the username selected already been used.	M
5	SBAMA4ICT_01_05	Message will be prompted if the password and confirm password field are not match.	M
6	SBAMA4ICT_01_06	Message will be prompted if the email selected already been used.	M
7	SBAMS4ICT_02	**Log In System (Administrator, School Admin & Assessor)**	
8	SBAMA4ICT_02_01	User must enter username, password and email to login.	M
9	SBAMA4ICT_02_02	User could cancel the login by clicking on home link.	O
10	SBAMA4ICT_02_03	Message will be prompted if username, password and/or email are not match.	D

Figure 4.2 shows the Use Case Diagram of the system. This diagram consist of three (3) actors; Administrator, School Admin and Assessor and sixteen (16) use cases. Figure 4.3 shows the Use Case Specification for the login into system. Appendix 4 provides a full list of Use Case Specification for this system. Part of the Activity Diagram for the login process showed in Figure 4.4. The complete activity diagram for the system could be reviewed in Appendix 5. Figure 4.5 shows a Sequence Diagram for the login process in this system. Meanwhile Appendix 6 provide a

complete Sequence Diagram for this system. As for the Class Diagram, it could be
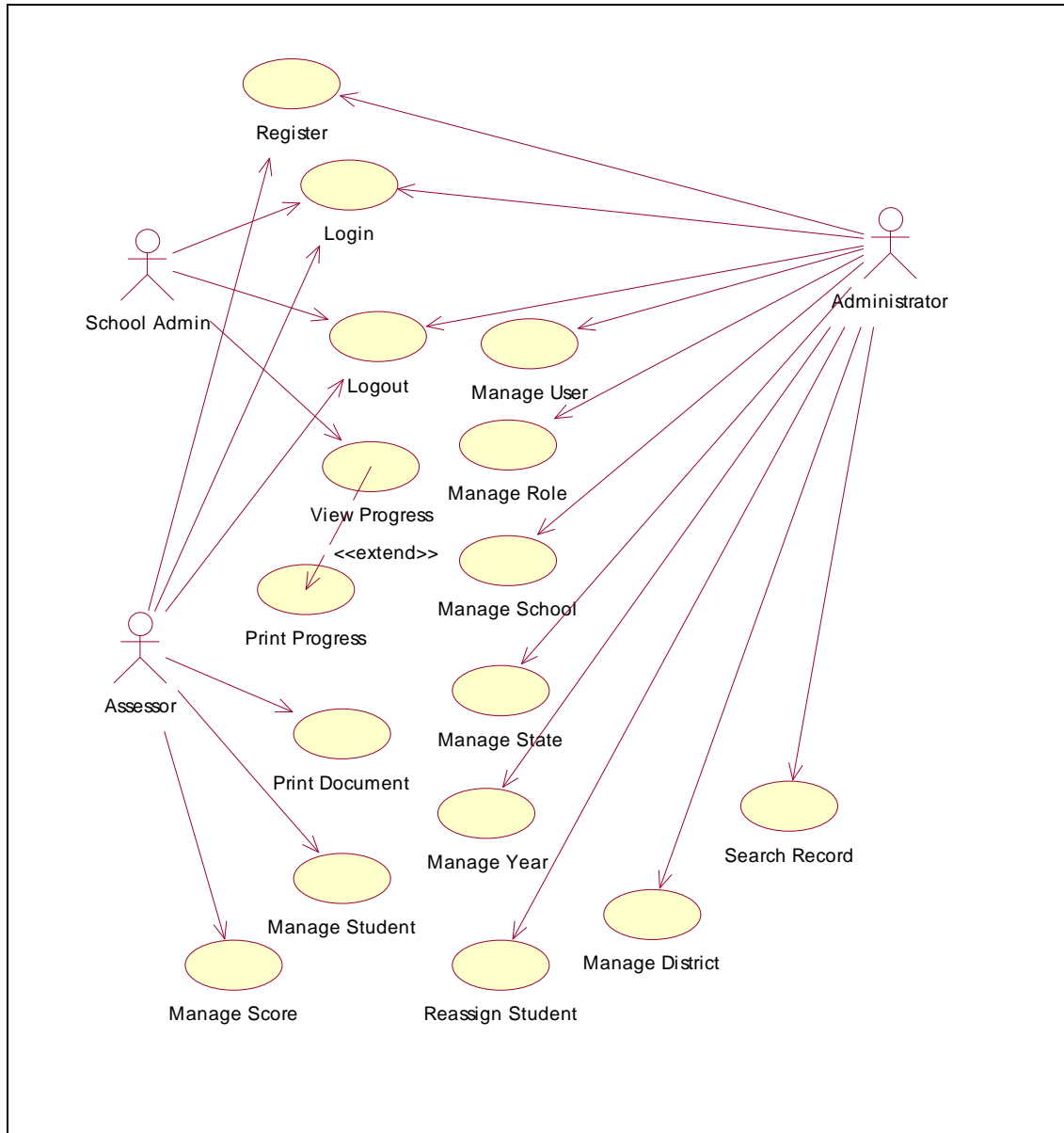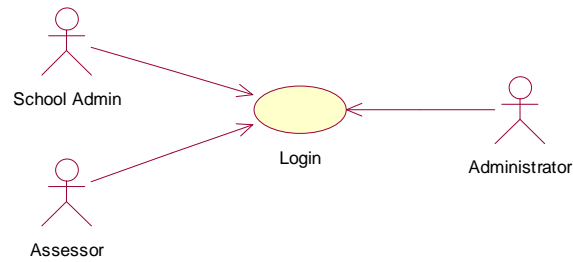
reviewed in Appendix 7.

Figure 4.2: Use Case Diagram of the SBAMS4ICT

2	USE CASE: LOG IN SYSTEM (SBAMS4ICT_02)

2.1   BRIEF DESCRIPTION
This use case allows users (Administrator, School Admin and Assessor) to login into the system

2.2   PRE-CONDITIONS
The user launches the web browser and enters web address for the system. The homepage of the system will be displayed with login link. Then, the user clicks on the login link.

2.3   CHARACTERISTIC OF ACTIVATION
Event-driven (on user's demand)

2.4   FLOW OF EVENTS

    2.4.1   Basic Flow   (SBAMS4ICT_02_01)
    1.   This use case begins when user click on the Login link.
    2.   The system will display a login form.
    3.   The user will key in their username, password and email.
    4.   The user will press Log In button.
        [A1: Click on Home Link]
    5.   The system will log the user in the system and display the default page for registered user.
        [E1: Username, Password or Email Not Match]

    2.4.2   Alternative Flow
    [A1: Click on Home Link]   (SBAMS4ICT_02_02)
    1.   The user click on Home link.
    2.   The page will redirect to anonymous default page.

    2.4.3   Exceptional Flow
    [E1: Username, Password or Email Not Match]   (SBAMS4ICT_02_02)
    1.   As the username, password or/and email provided by user are not match, the system will prompt a message and will ask the user to re-enter the username, password and email.

2.5   POST-CONDITIONS
    1.   User will be able to log into the system.
    2.   The system will display the default page for the registered user. The system will display the menu based on the content which could be accessed by user's role.

2.6   RULE(S)
    1.   User's account must exist and role has been assigned.

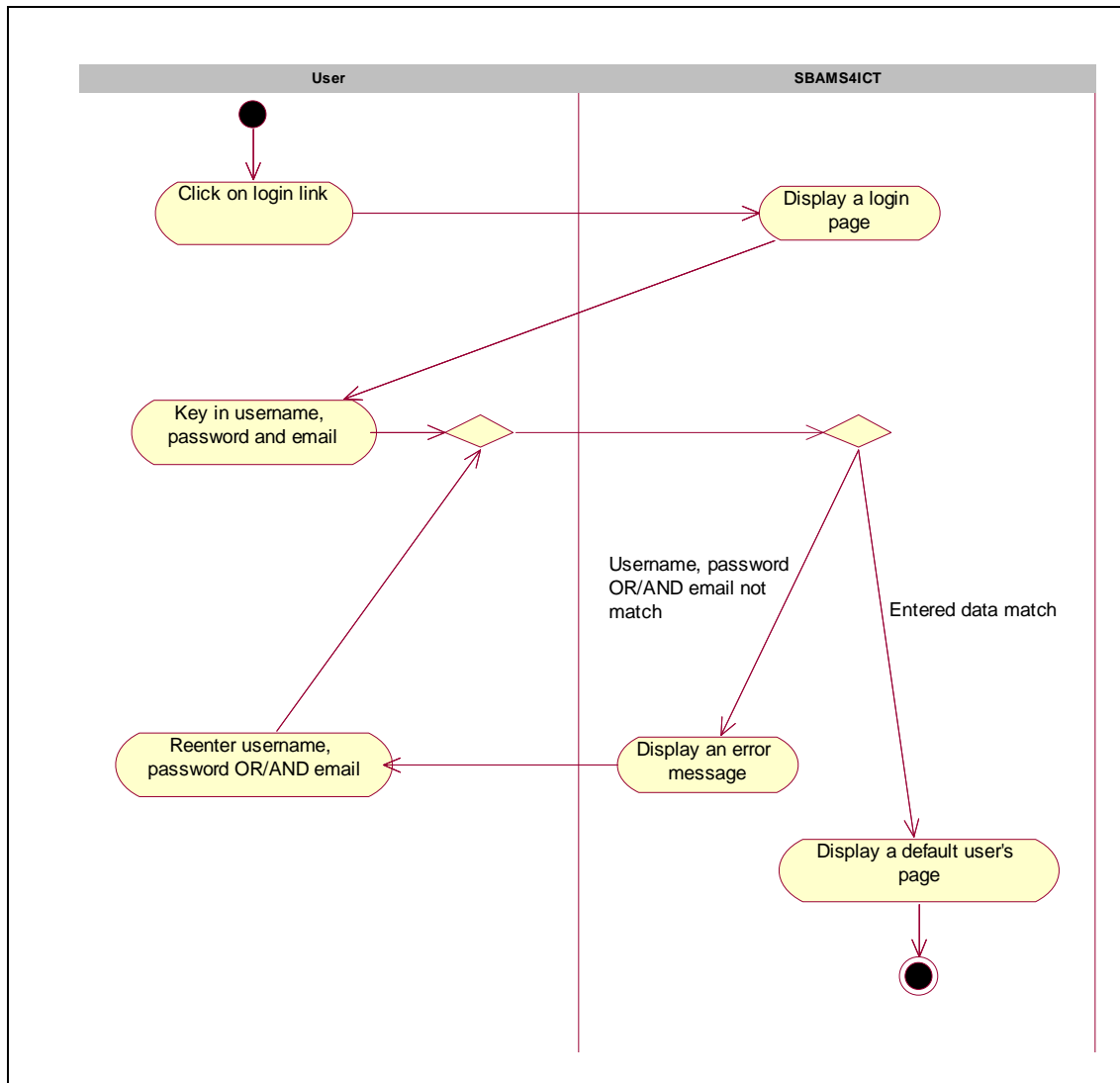*Figure 4.3: Use Case Specification for SBAMS4ICT*

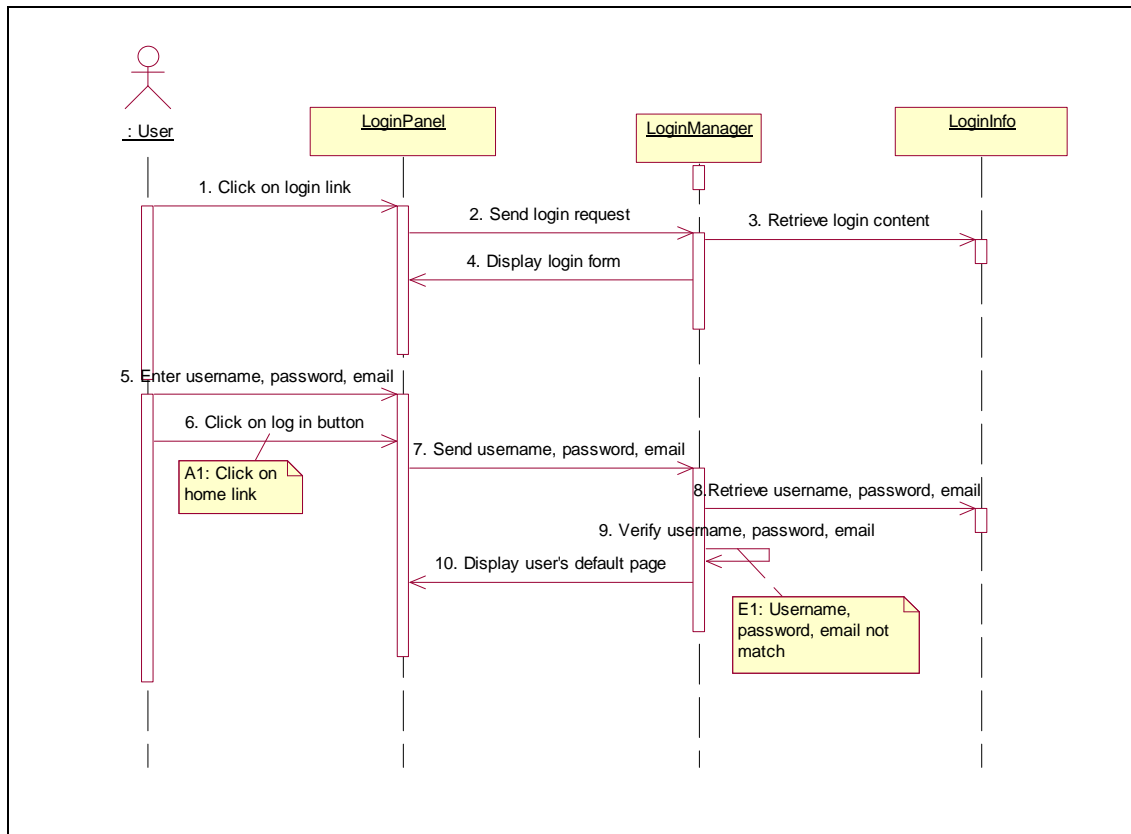*Figure 4.4: Activity Diagram for SBAMS4ICT*

Figure 4.5: Sequence Diagram for SBAMS4ICT

4.3   Design

The next sub-phase is design. The purpose of the systems design sub-phase is to create a physical model that will satisfy all documented requirements for the system. At this stage, the interface has been designed and necessary outputs, inputs, and processes been identified. In addition, selected internal and external controls, including computer-based and manual features also been designed to guarantee that the system will be reliable, accurate, maintainable, and secure. During the systems design sub-phase, the application architecture also been determined, which researcher used to transform the logical design into program modules and code. Then, the new system prototype is constructed. Programs are written, tested, and documented. Afterward, the selected feature prototype is ready to be tested.

4.3.1 Interface Design

The user interface is the part of a computer and its software that people can see, hear, touch, talk to, or otherwise understand or direct (Galitz, 2007). The user interface has essentially two components: input and output. Input is how a person communicates his or her needs or desires to the computer. Output is how the computer conveys the results of its computations and requirements to the user. The best interface is one that is not noticed, and one that permits the user to focus on the information and task at hand instead of the mechanisms used to present the information and perform the task.

The ASP.Net provide an impressive innovation called master pages, enabling the creation of reusable page templates (Matthew, Dan, & Adam, 2010). Using a master page, the layout for website pages, complete with all the usual details such as headers and menu bars been defined. Once this structure been formalized, the master page could be used throughout a website, ensuring that all pages have the same design. Users can then surf from one section to another without noticing any change. The only changes is on the content place holder, where it will shows the contents for selected menu. Figure 4.6 shows a master page design for the developed system prototype.
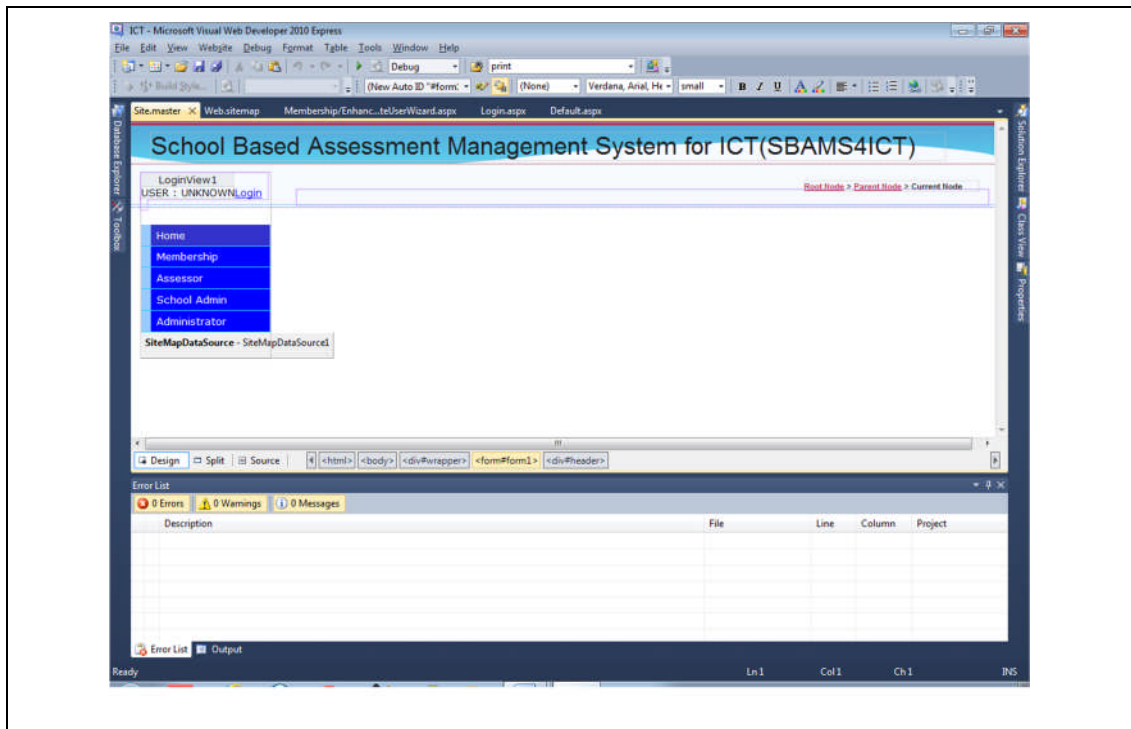
Figure 4.6: Master Page Design

Navigation is a fundamental component of any website. Although it's easy enough to transfer the user from one page to another, creating a unified system of navigation that works across an entire website takes more effort. ASP.NET has a built-in navigation system that makes it easy. The site map model using *SiteMapDataSource* lets the researcher define the navigation structure of the website and bind it directly to rich controls. ASP.NET includes a set of navigation features that you can use to dramatically simplify the task. Figure 4.7 show the design of navigation structure for the developed system prototype.
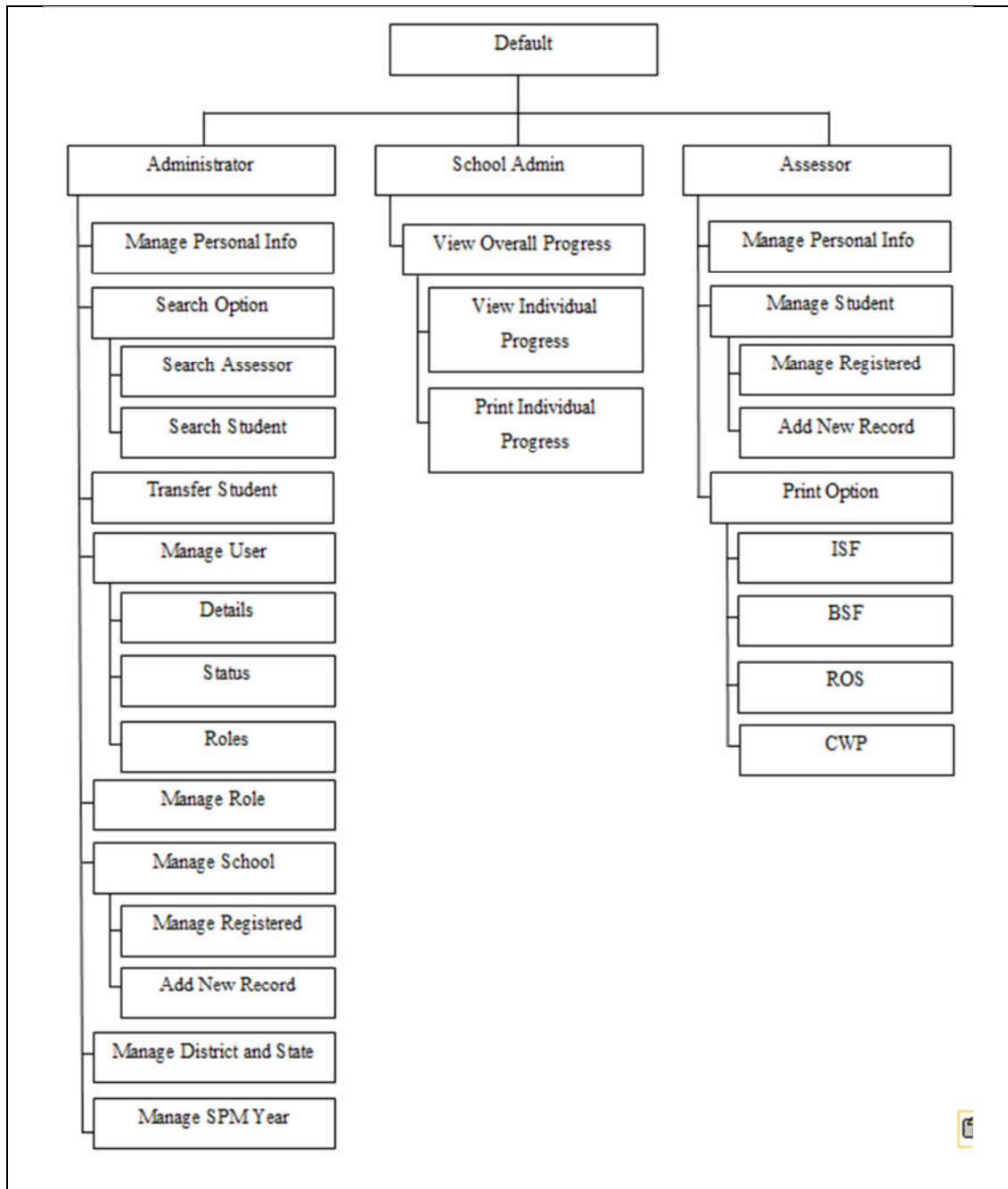
Figure 4.7: Navigation Structure

Meaningful menu placed on the left side of the page. The menu is based on roles assigned to the user. Table 4.2 shows menu allocation for users' roles. Once logged in, user would only navigate the menu provided based on roles assigned. This option been implemeted using security trimming in ASP.NET.

Table 4.2: Menu Allocation for Users' Roles

Role	Menu
Administrator	- My Personal Info - Search Option - Transfer Student - Manage User - Manage Role - Manage School - District | State - Manage SPM Year
School Admin	View Progress
Assessor	- My Personal Info - Manage Student - Manage Score - Print Option

4.3.2   Database Design

Almost every piece of software ever written works with data. In fact, a typical web application is often just a thin user interface shell on top of sophisticated data-driven code that reads and writes information from a database. Often, website users aren't aware (or don't care) that the displayed information originates from a database. The most common way to manage data is to use a database. Database technology is particularly useful for business software, which typically requires sets of related information (Matthew M. , 2010).

Visual Web Developer has everything you need to get started with SQL Server (Christian, Wyatt, & Tim, 2011). As for this project, Microsoft SQL Server 2008 Management Studio has been used to create the *aspnetdb* database which automatically include the table needed for membership and role management. This provider is actually used to handle the users' registration and role assignment capability for the system prototype. Then the created database has been integrated

and altered using Microsoft Visual Web Developer 2010 Express. Here, the additional table been added in order to store any intended data and record for the system prototype.

To enable researcher work efficiently with the data in this system prototype, ASP.NET offers set of data-aware controls, called the data-bound controls (Imaar, 2010). The use of this data-bound control is to display and edit data on developed system prototype. As for this system, *GridView*, *Repeater*, and *FormView* have been used to display the data. The *GridView*, and *Repeater* are all able to display multiple records at the same time. The *FormView* are designed to show a single record at a time. Table 4.3 shows some tables used by ASP.NET 2.0 providers to persist state in SQL Server. These tables are created using the *aspnet_regsql.exe* tool that comes with ASP.NET. Table 4.4 show additional tables created to fulfill the requirement of this system. Appendix 5 provide a details about tables used for this system.

Table 4.3: Tables Used by ASP.NET 2.0 Providers to Persist State in SQL Server

Name	Description
aspnet_Applications	Used by ASP.NET features to provide an application scope for data.
aspnet_Membership	Used by the SQL Membership Provider to store membership data.
aspnet_Paths	Used by the SQL Personalization Provider to store the path for which Web Parts personalization state has been saved.
aspnet_PersonalizationAllUsers	Used by the SQL Personalization Provider to store shared personalization data.
aspnet_PersonalizationPerUser	Used by the SQL Personalization Provider to store per-user personalization data.
aspnet_Profile	Used by the SQL Profile Provider to store individual instances of property values.
aspnet_Roles	Used by the SQL Role Provider to store role data.
aspnet_Users	Used to store information regarding users, including user names and IDs.
aspnet_UsersInRoles	Used by the SQL Role Provider to map roles to users.

Table 4.4 Additional Tables to Stored Data Related to ICT Assessment

Name	Description
Student	Used to store detail about student and scores for every assessment aspect.
Form	Used to store form data.
School	Used to stored detail about school.
District	Used to store district data.
State	Used to store state data.
SpmYear	Used to store SPM year data.
UserProfiles	Used to store profile about user.

4.3.3   System Prototype

Visual Web Developer 2010 Express been used as the Integrated Development Environment for this system. Codes have been written for creating a database connection, displaying data and managing resources. Figure 4.8 shows an interface of Microsoft Visual Web Developer 2010 Express.

4.3.3.1 Anonymous Default Page

Whenever users access the system, they will be prompted with the anonymous default page. Here, user has the option either to login or to register for a new account. As for administrator, the account has been created during development phase. Any additional administrator (if needed) could be implemented later on by assigning administrator's role to intended user. As for the school admin, their account need to be created by administrator utilizing school code as the username. New assessor need to register their account first. Then the administrator will assign an assessor's role to the newly registered assessor. Whenever the role been assigned, the assessor would be able to utilize the assessor option in the system.
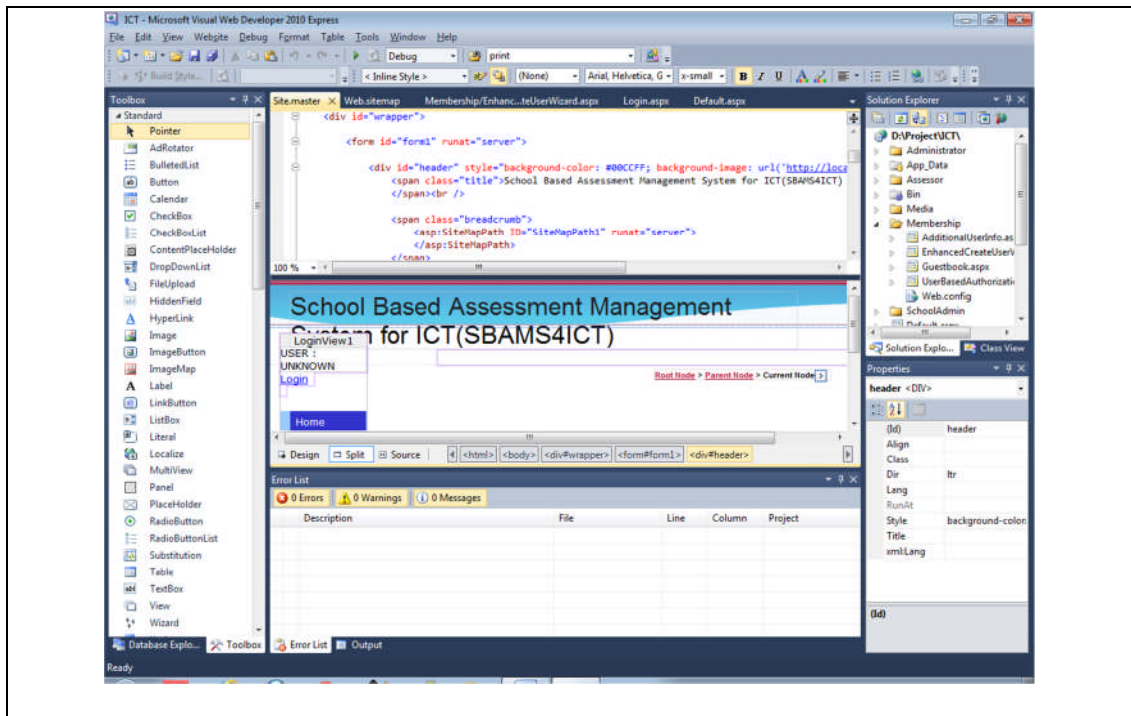
Figure 4.8: Microsoft Visual Web Developer 2010 Express

Figure 4.9 show the anonymous default page, where the user login status is unknown.
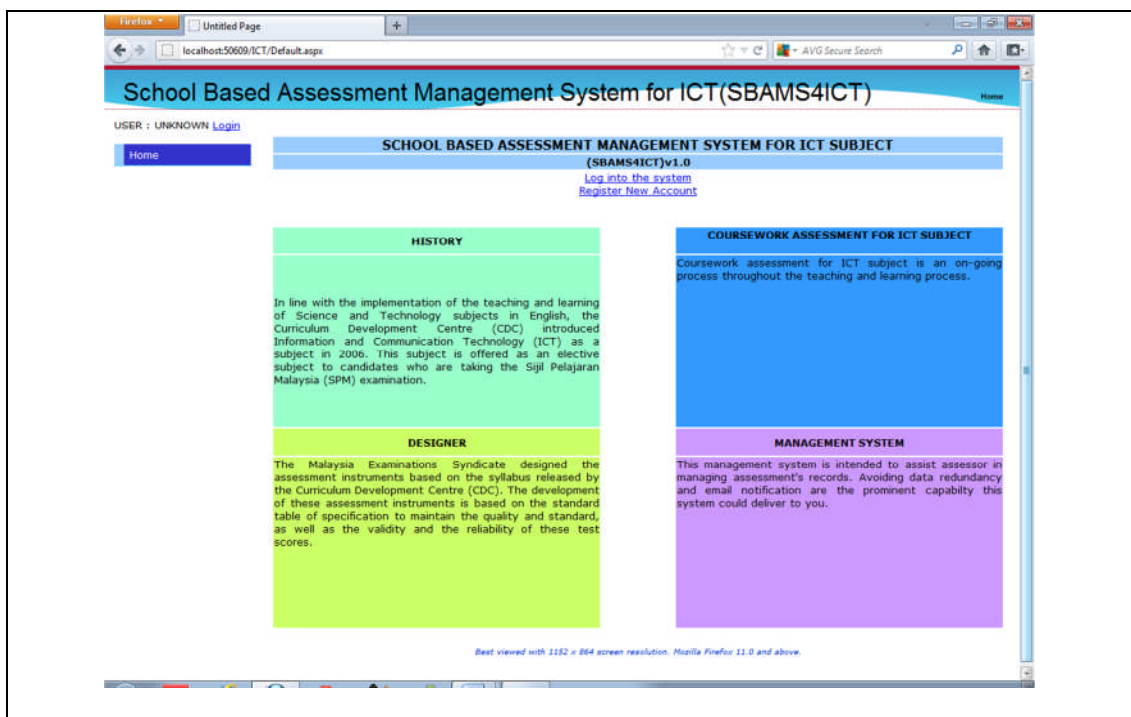

Figure 4.9: Anonymous Default Page

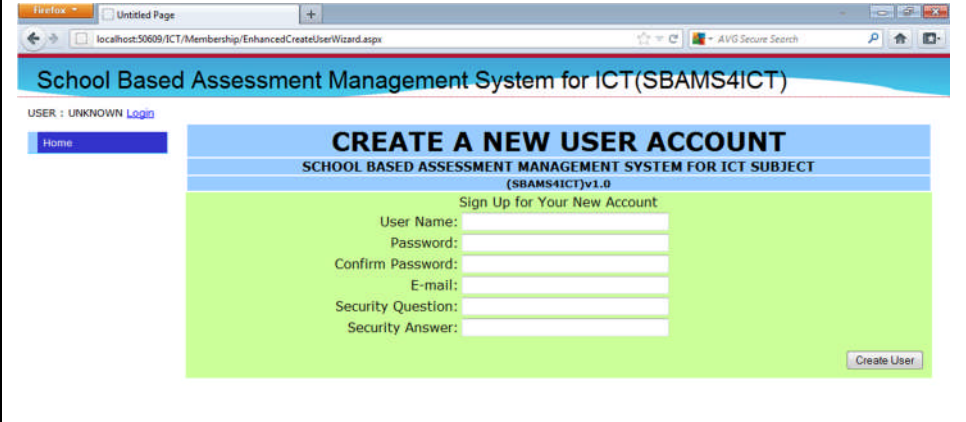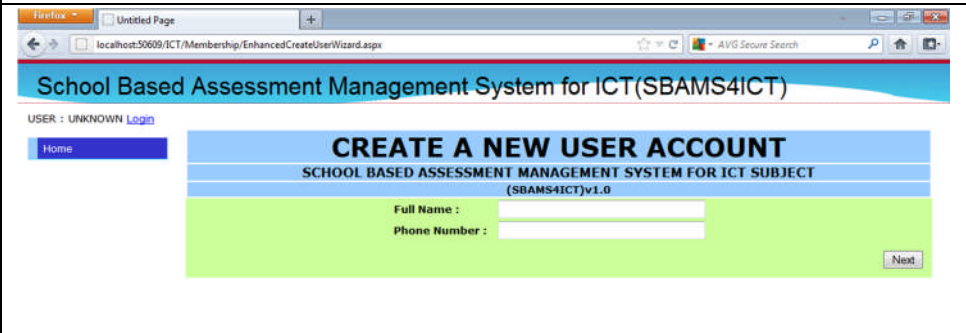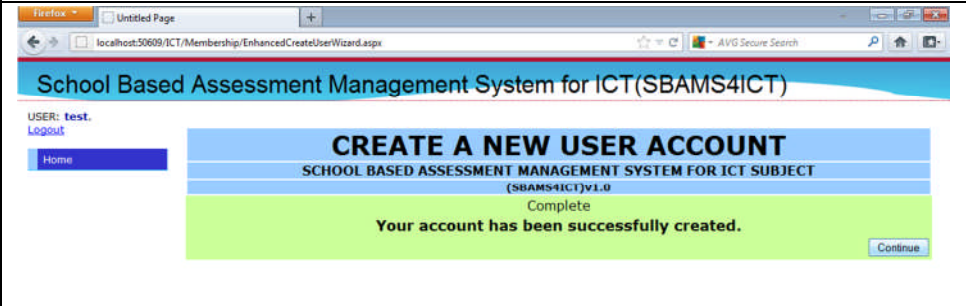Figure 4.10 shows pages for a registration sequence whenever user choose to create new account.

Figure 4.10: Registration Sequences

4.3.3.2 Users Default Page

Once role has been assigned to the registered user, they would be able to log into the system and use the system based on the assigned role. All users use the same login page. Anyhow, the content displayed after the succesful login will be vary based on their role. Figure 4.11 shows a login page for the system prototype. Meanwhile default page for administrator, assessor and school admin shown by Figure 4.12, Figure 4.13 and Figure 4.14.
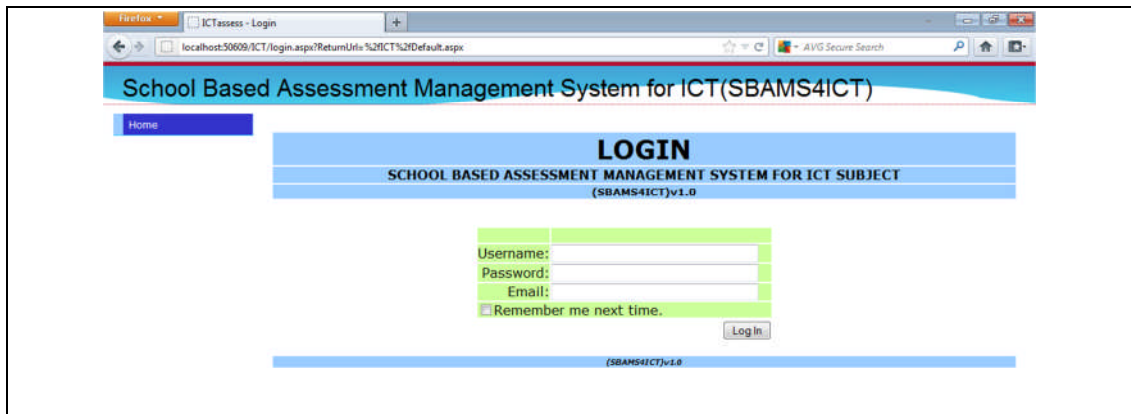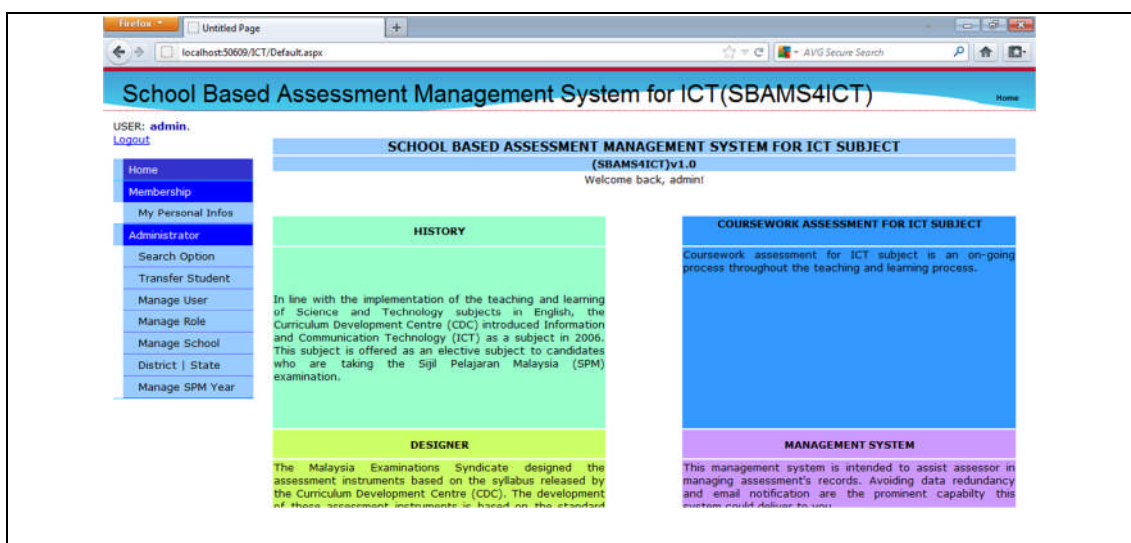
48

Figure 4.11: Login Page

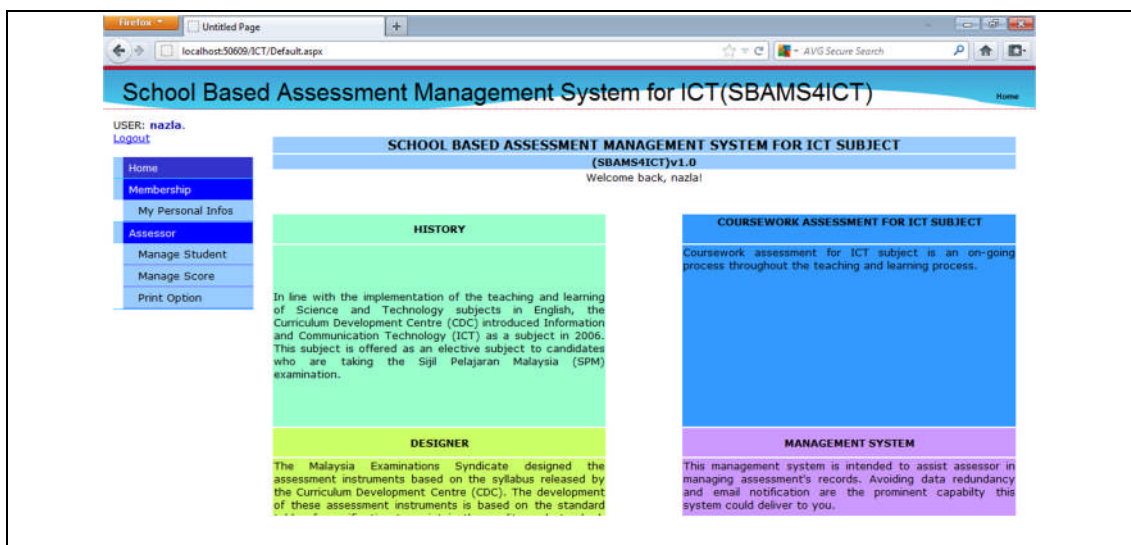*Figure 4.12: Administrator's Default Page*

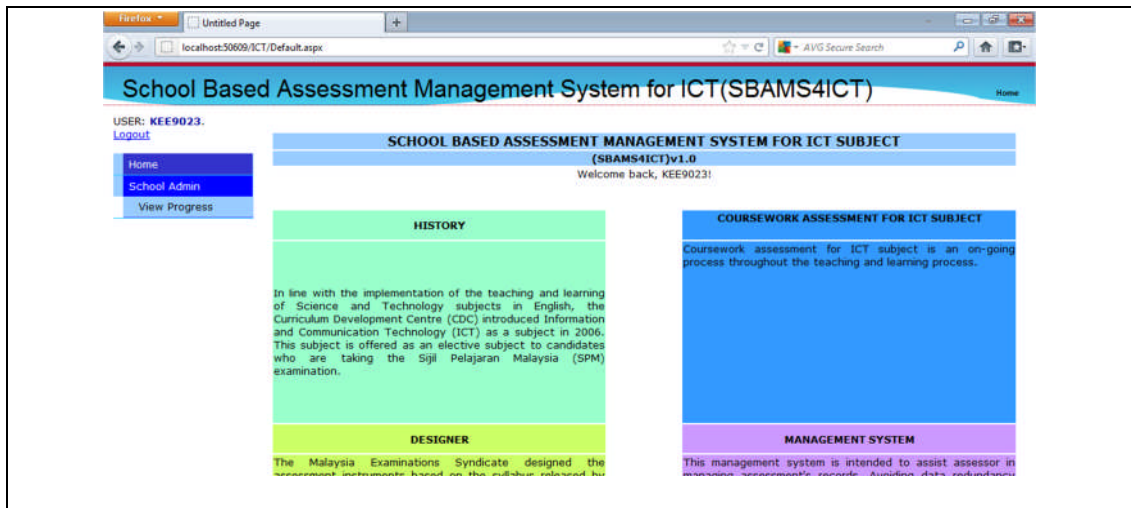*Figure 4.13: Assessor's Default Page*

Figure 4.14: School Admin's Default Page

4.3.3.3 School Admin's Pages

There is only one menu provided for the school admin, View Progress. Here, school admin will be able to view an overall students' assessment progress based on SPM year. SPM year selection could be change by selecting registered SPM year from drop down menu. The contents displayed will be filtered based on selected SPM year. From the filtered content, school admin could display an individual student progress by selecting the intended student. The details for selected student will be displayed and could be printed as well. Figure 4.15 and Figure 4.16 show the school admin option.

Figure 4.15: Overall Progress for Selected SPM Year
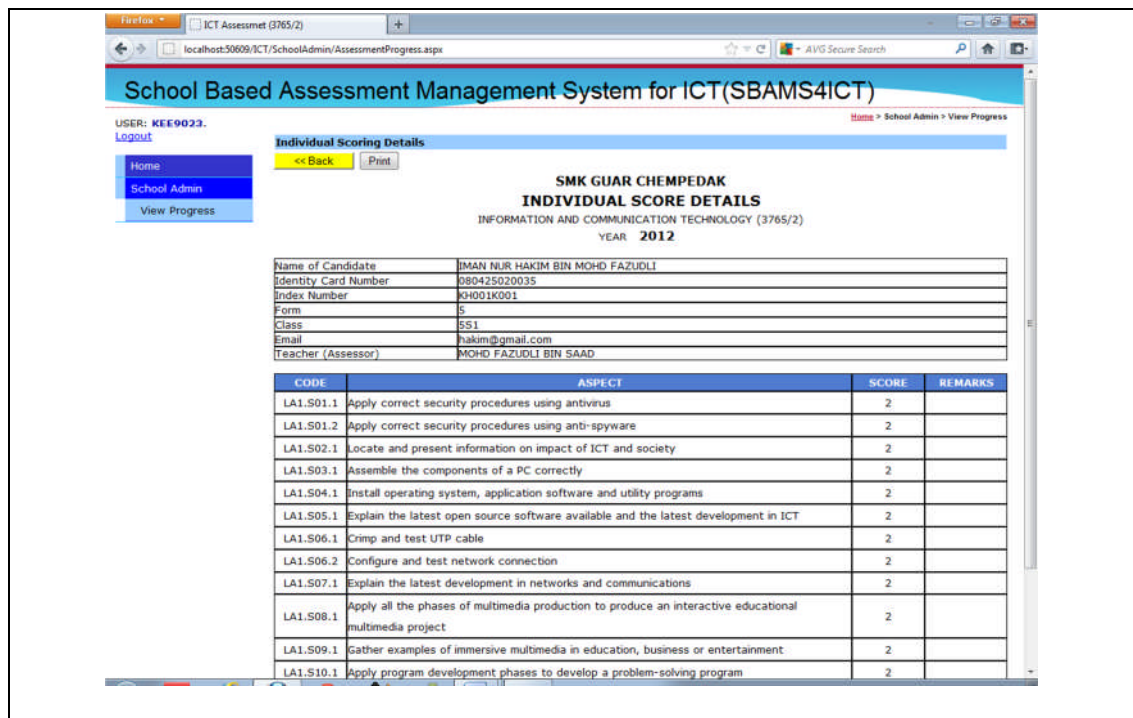
Figure 4.16: Personal Progress for Selected Student

4.3.3.4 Assessor's Pages

Four menus been assigned for an assessor in providing a simple students' assessment records management. There are;

    i.   My Personal Info,

    ii.   Manage Student,

    iii.   Manage Score, and

    iv.   Print Option.

Assessor could update the personal detail, if needed, through My Personal Info menu. As for this project, only two (2) additional information provided could be changed; full name and phone number. Figure 4.17 show the capture of personal detail update page for an assessor.
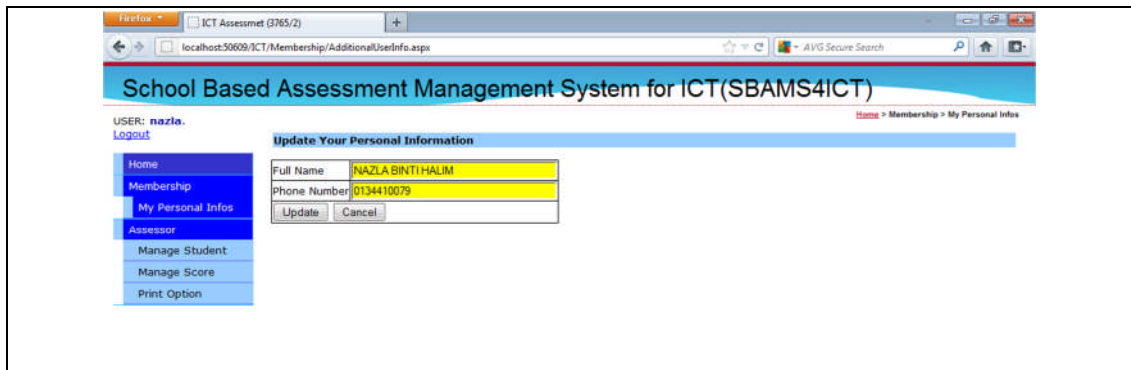
Figure 4.17: Updating Personal Information for Assessor

In order to manage students' assessment record, student's data need to be entered first into the system database. Then, the registered student's records could be updated if needed. Figure 4.18 show a capture of option page for student management. Meanwhile, Figure 4.19 shows page for managing registered student's record and Figure 4.20 show the page for adding new student's record.

Figure 4.18: Student Management Option Page
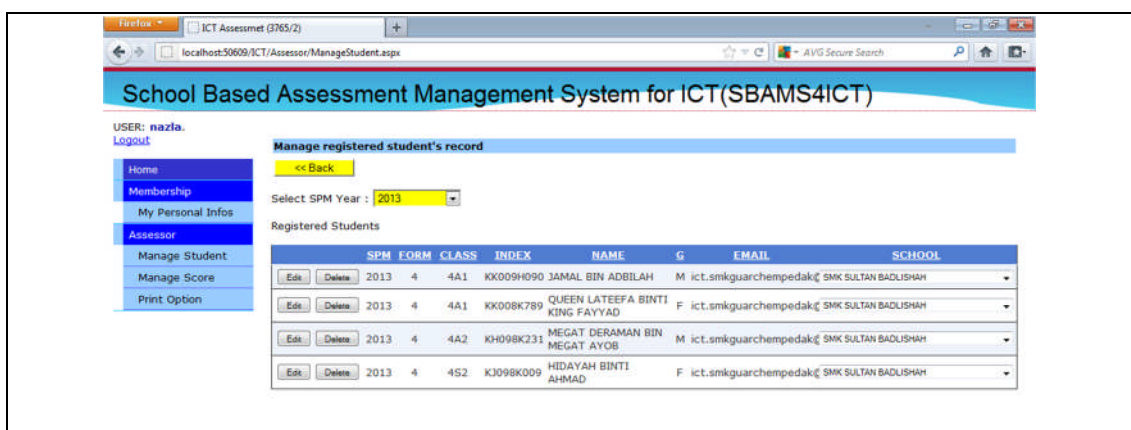
Figure 4.19: Managing Registered Students' Record

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Figure 4.20: Adding New Student's Record

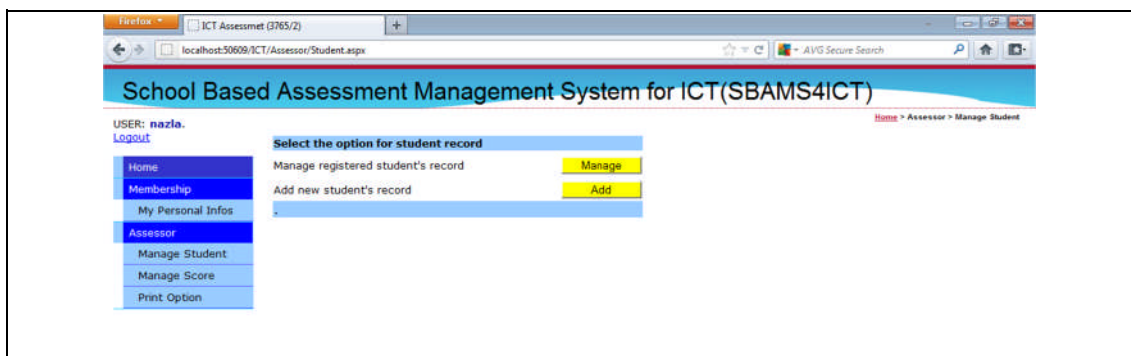The main purpose of this system development been delivered through manage score menu on the assessor page. Every score for the registered students will be able to be managed by the assessor. The filteration on the students implemented on their SPM year. Figure 4.21 show the screen capture whenever manage score menu being clicked.

Figure 4.21: Manage Students' Score Page

Figure 4.22 shows a detail score for the selected student. Here, assessor could update the score, date and remarks for the score as well. The score update for the selected students could be email to registered email address by clikcking on the email button. Figure 4.23 shows the example of email received by student.

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Figure 4.22: Update Score for Selected Student
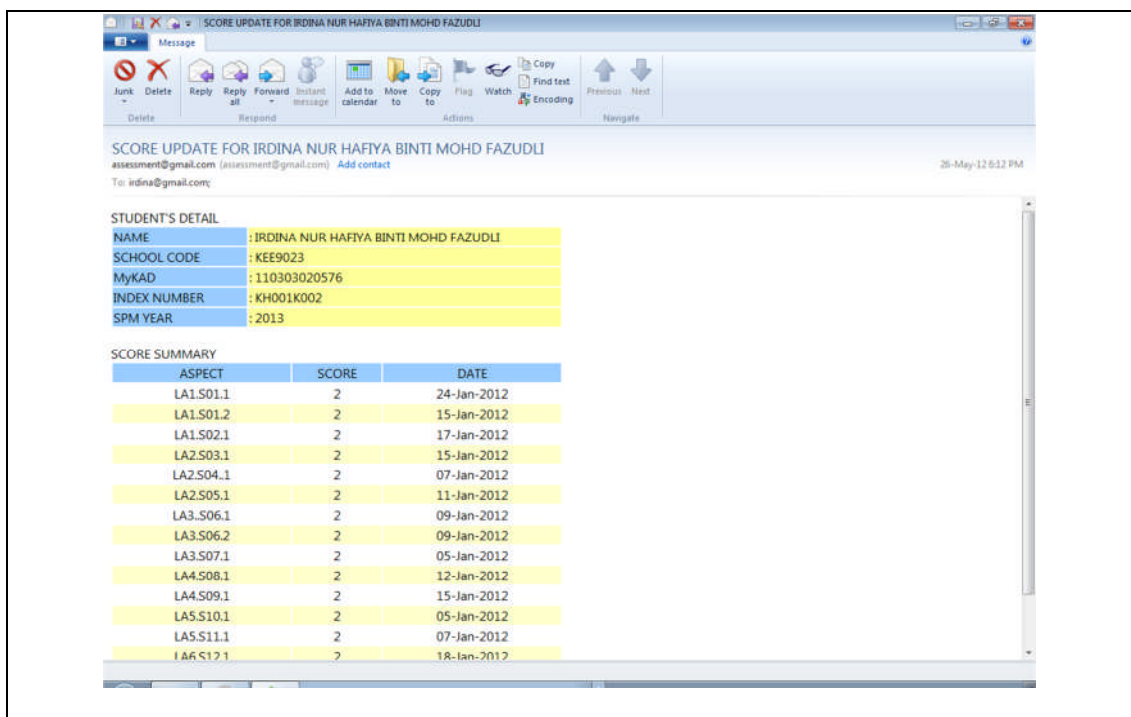
Figure 4.23: Email Received by Student

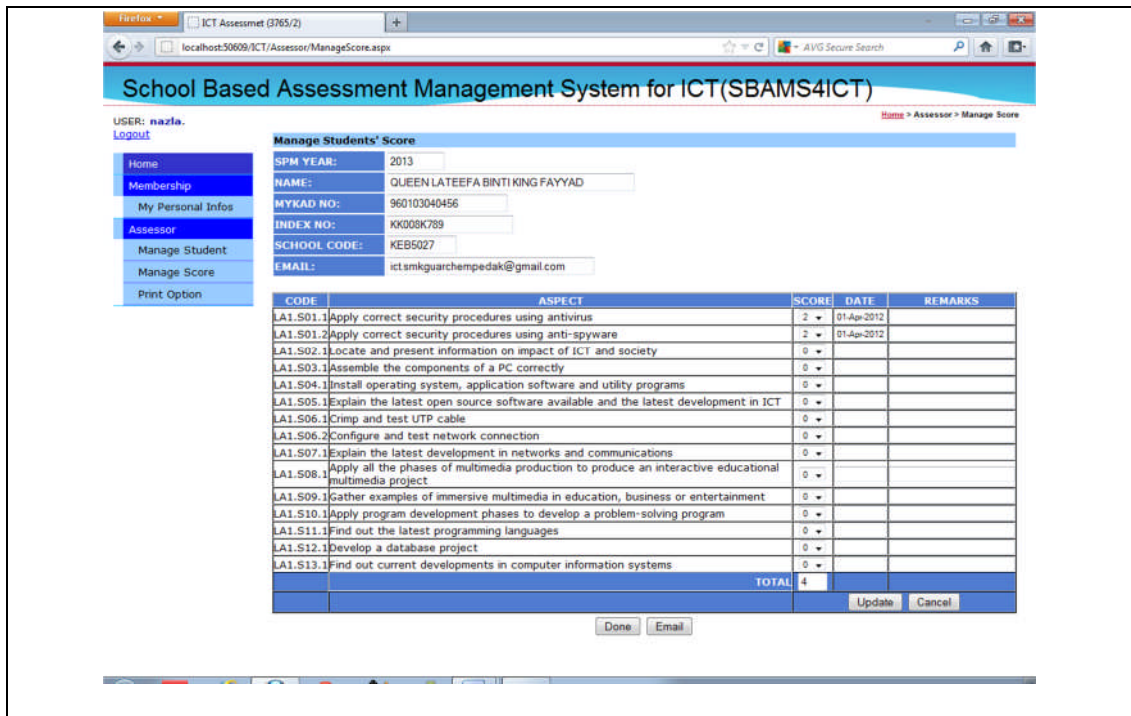Every record for the students' assessment could be printed through print option page.

This function is obviously the benefit which this system could deliver to the assessor.

By replacing manual method on transfering the same data from one form to another,

the printing option retrive the records entered and provide a printing capability for the assessor. Four (4) type of form provided by the system, namely; Individual Scoring Fom (ISF), Batch Score Form (BSF), Record of Submission (ROS) and Coursework Portfolio (CWP). As for ISF, ROS and CWP print option, students are filtered based on their registered SPM year. The printing option will be displayed whenever inteded student been selected. Figure 4.24 shows the printing option page where assessor could made their selection. Meanwhile Figure 2.25, Figure 4.26, Figure 4.27 and Figure 4.28 showing ISF, BSF, ROS and CWP printing option respectively. Appendix 10 provides a sample of document printed through this system prototype.

Figure 4.24: Printing Option Page

Figure 4.25: Print ISF

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Figure 4.26: Print BSF

Figure 4.27: Print ROS

Figure 4.28: Print CWP

4.3.3.5 Administrator's Pages

There are eight (8) menus provided for administrator, named:

    i.   My Personal Info

    ii.   Search Option

    iii.   Transfer Student

    iv.   Manage User

    v.   Manage Role

    vi.   Manage School

    vii.   District | State

    viii. Manage SPM Year

My Personal Info provides a capability to the administrator to change administrator personal details, if needed, through My Personal Info menu. As for this project, only two (2) additional information provided could be changed; full name and phone number. Figure 4.29 shows the mentioned screen capture.
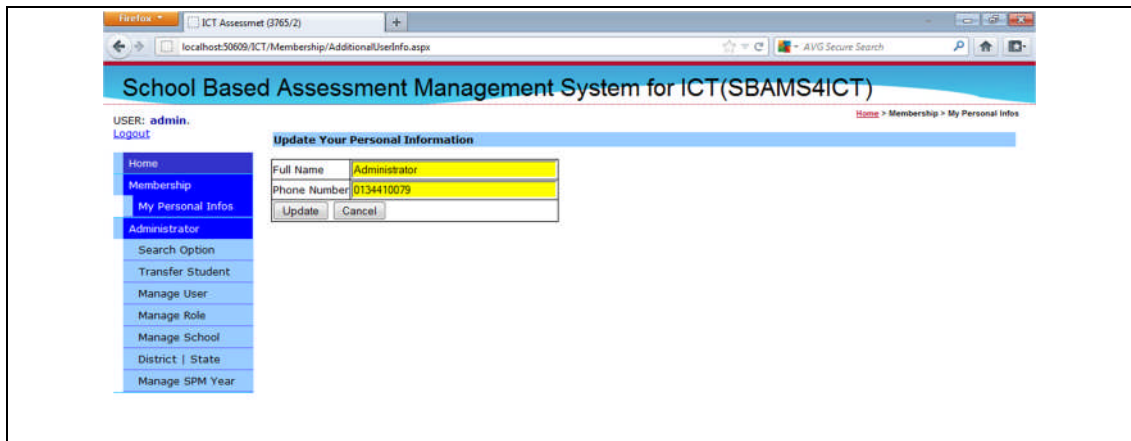
Figure 4.29: Updating Personal Information for Administrator

When there is an increasing number in registered user and students' records, there will be a large amount records stored in the system. Retrieving records related to the system users and records about students would be a cumbersome. Search Option provides a search utilities to the administrator to search information about assessors. and students. Figure 4.30 shows a screen capture of search categories available.
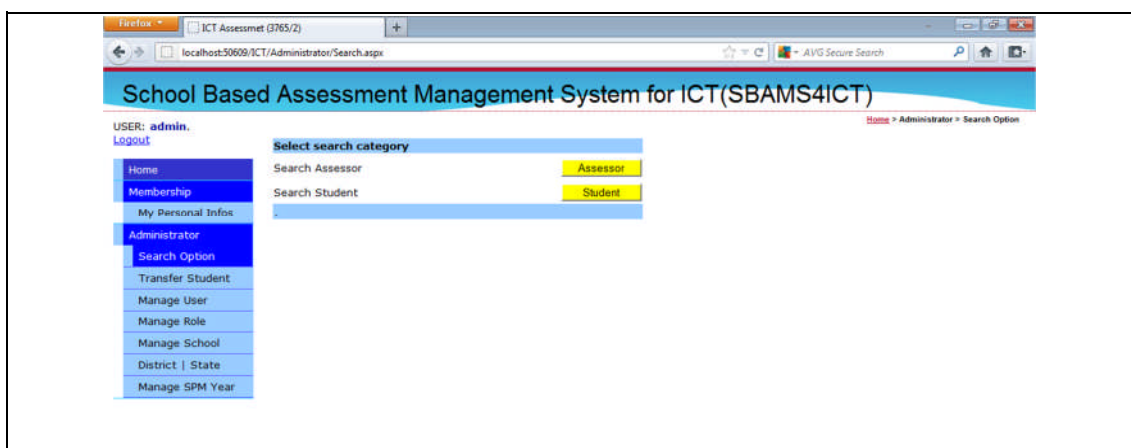
Figure 4.30: Search Option

Whenever administrator searching for an assessor, there are three (3) types of search options available, searching by Name, School or State. Figure 4.31 shows a page for assessors' searching option.
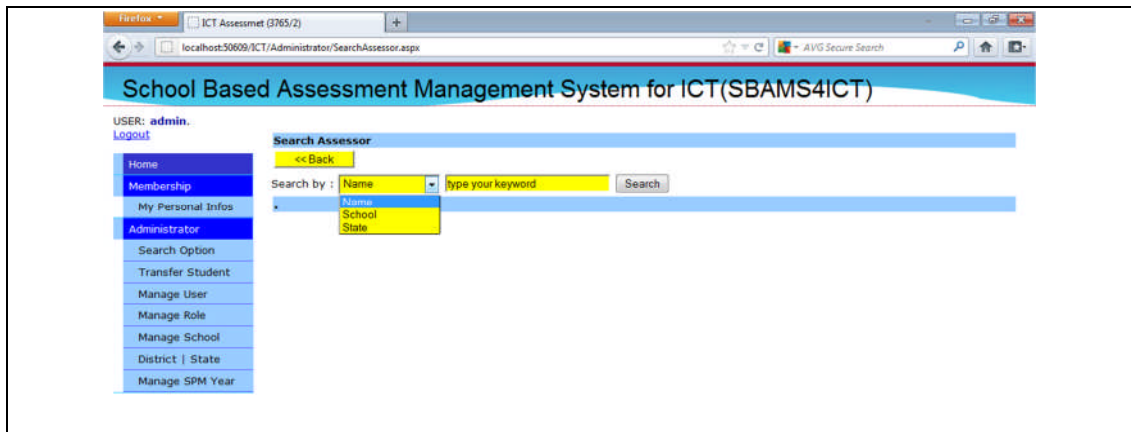
Figure 4.31: Assessors' Searching Option

The same thing goes for students' search option. Anyhow, there are four (4) types of search options available, searching by MyKad, Name, School or State. Figure 4.32 shows a page for students' searching option.
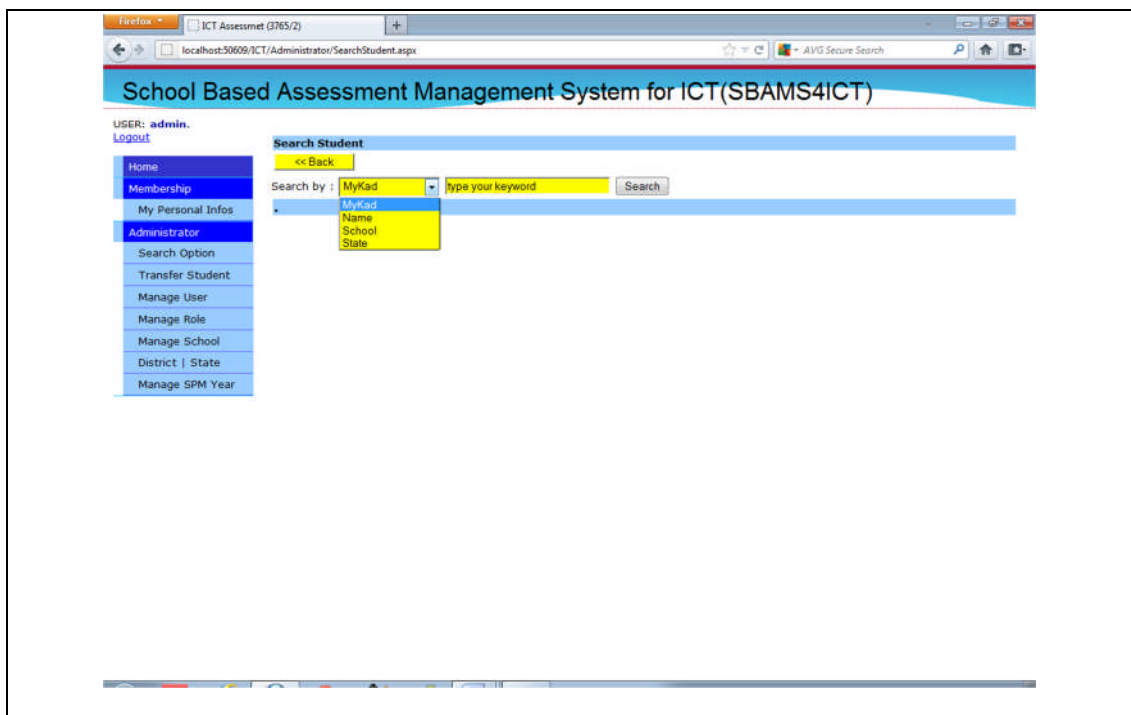
Figure 4. 32: Students' Searching Option

When there is a case student transfer from one school to another, the records for that particular student need to be transferred as well. Student's new assessor need to continue the coursework assessment for the affected student. The hardcopy of the

evidens need to be formally transferred by school management to student's new school. In order to change the assigned assessor for the students, administrator could implement this by clicking on Transfer Student menu. Here, the previous student's school need to be look for first. Then, the student could be assigned to a new assessor through editing option. The new assigned assessor will be able to view the affected student when they logged in to the system. Minor changes need to done by the newly assigned assessor specifically on details about school name. Figure 4.33 shows a transfer student page.
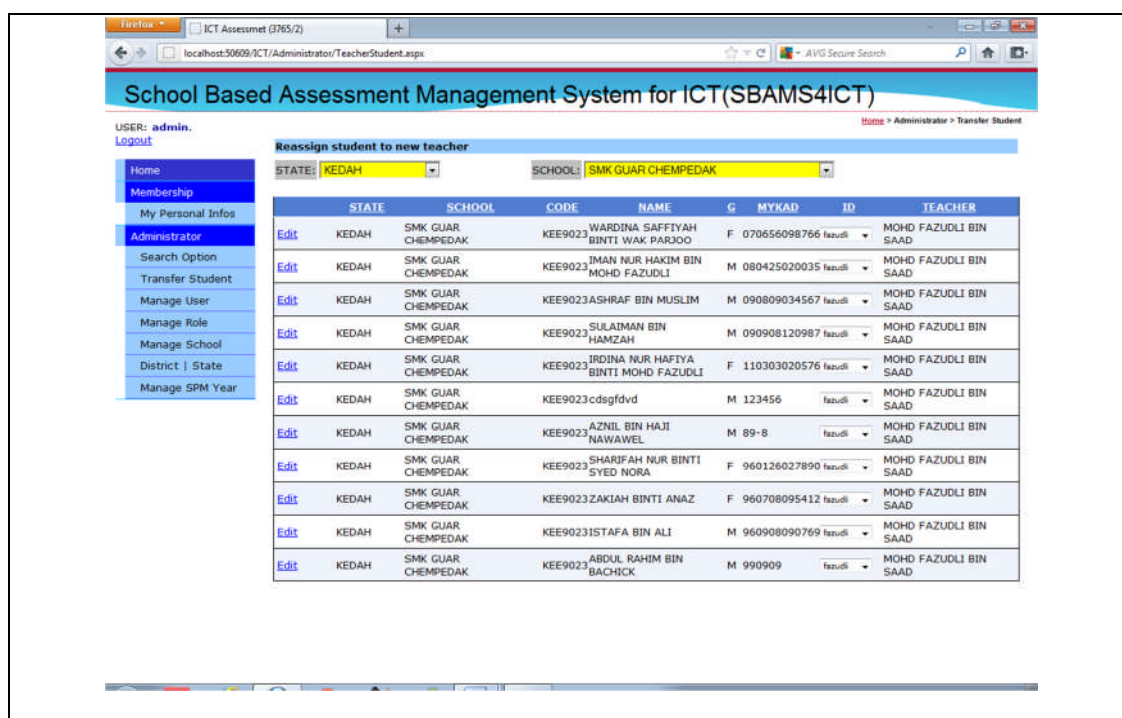
Figure 4.33: Transfer Student

Administrator could manage the registered users through system's user management capability. There are three (3) management option provided.

i.   Users' detail management

ii.   Users' status management, and

iii.   Users' role management.

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Figure 4.34 shows the users' management option provided by the system. Adminstrator could made the selection by clicking on the meaningful button.
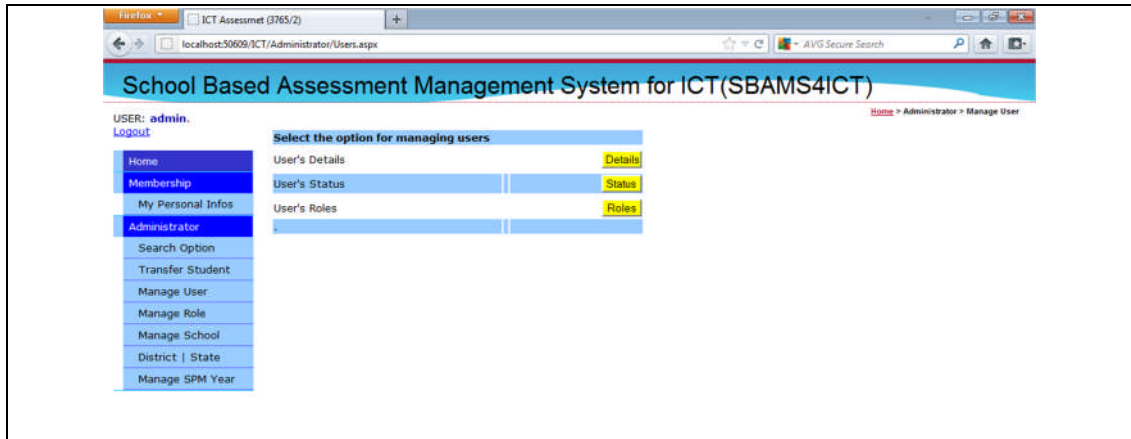
Figure 4.34: Users' Management Option

In user's detail management, editing and deleting of the registered users could be implemented. Figure 4.35 shows the capture of the page.
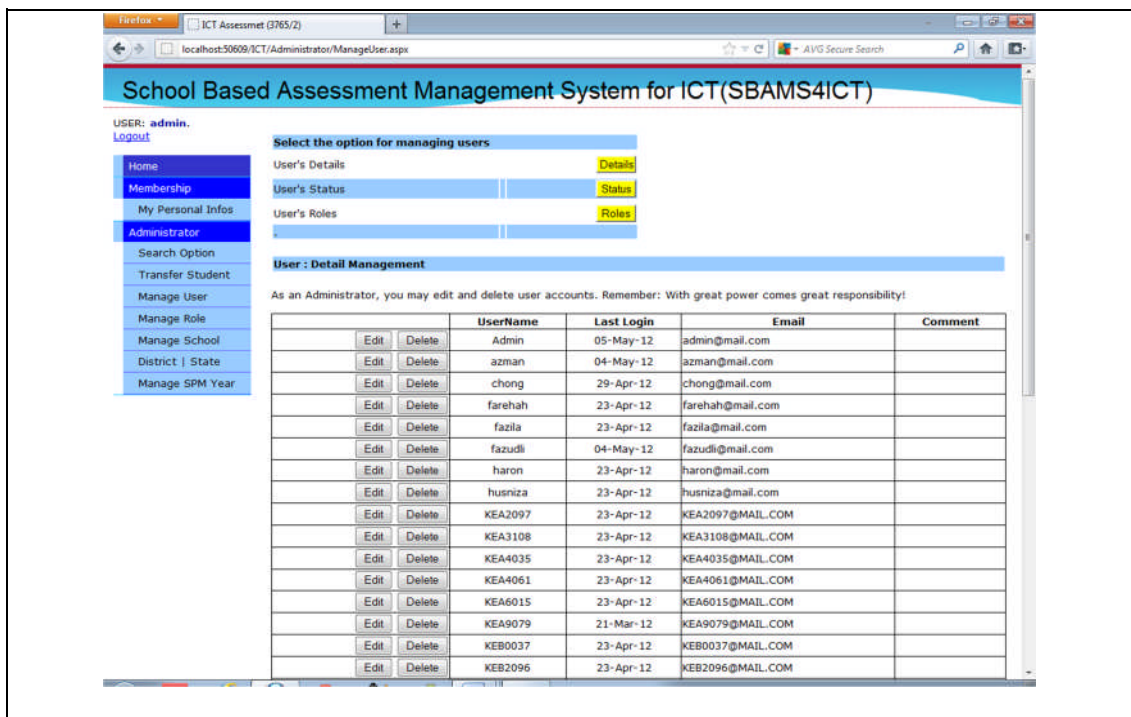
Figure 4.35: Users' Detail Management

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User's status management page providing a capabilities to the administrator in managing user's approvement and unlocking status. Figure 4.36 shows the page.
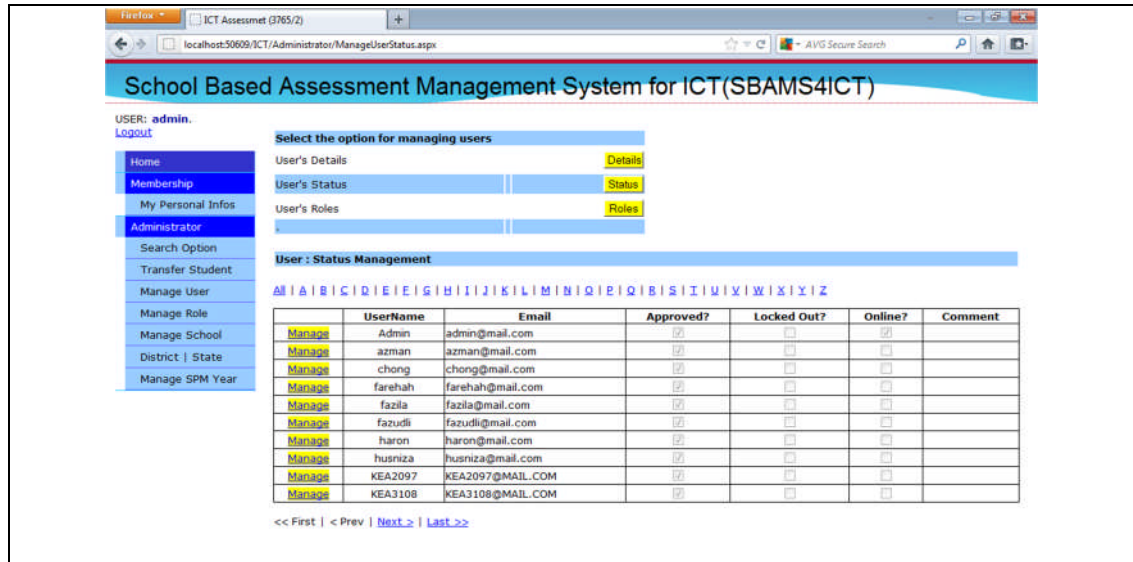
Figure 4.36: Users' Status Management

User's role could be assigned through user's role management page. Figure 4.37 shows the page where administrator could assign user with registered roles on the system prototype.
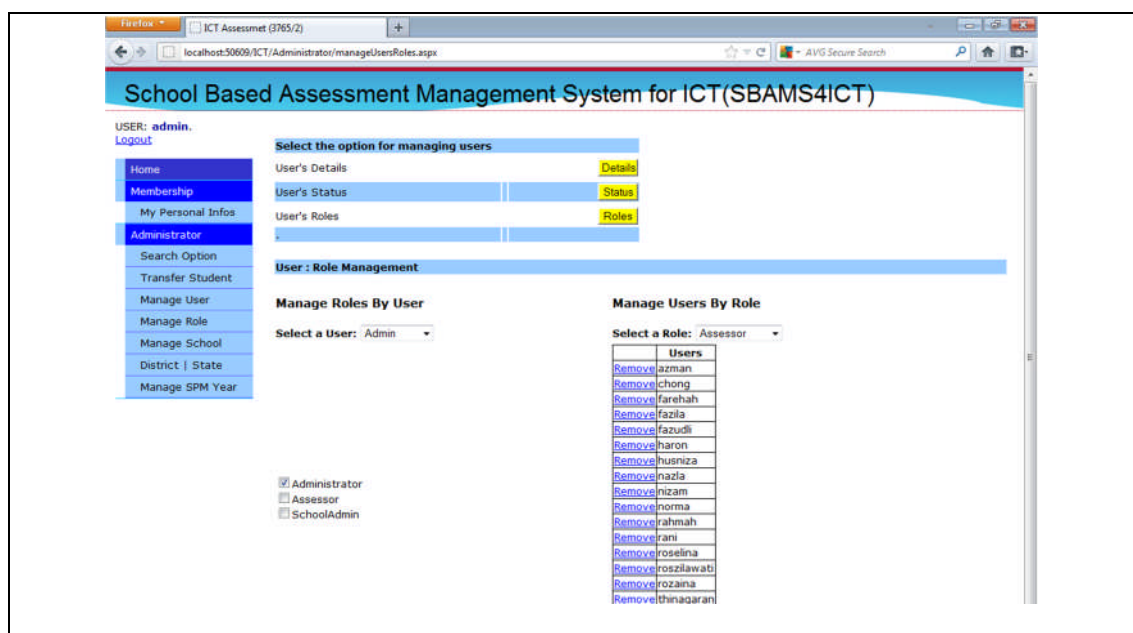
Figure 4.37: Users' Roles Management

Even there are only three (3) role exist in this system, administrator has an option to add a new roles, if needed in the future. Removing a registered role could be implemented as well. Anyhow, the deletion of available role will disable the deleted role capability to the assigned users. Figure 4.38 shows a capture of managing roles' page.
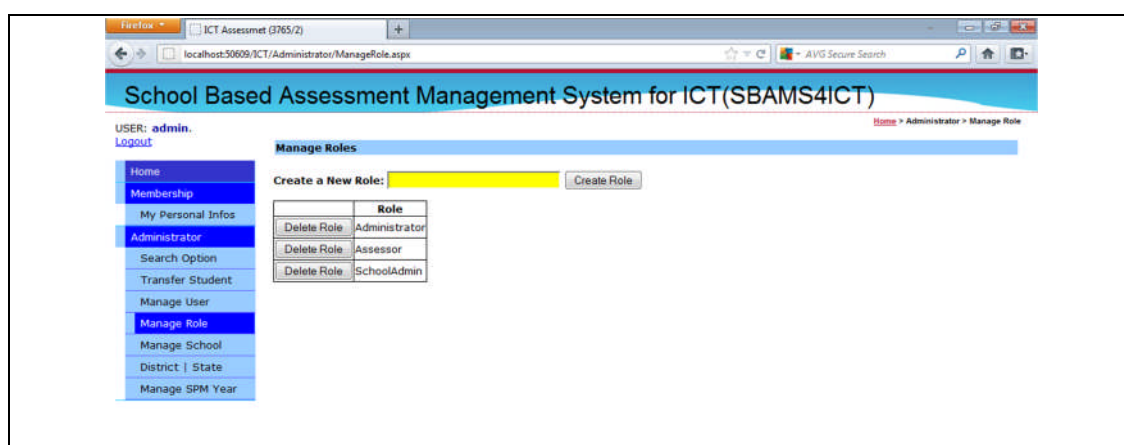
Figure 4.38: Manage Roles

Administrator also responsible to manage a school record. A single point school management record is an avoidance mechanisme from allowing an assessor to enter their school record on their own. This is to standardise a naming representation and style for the school code and name.

Managing a registered school record could be implemeted through this school management option, and adding new school record as well. Figure 4.39 shows a school management option. Managing a registered school records is shown by Figure 4.40, and adding new record is shown by Figure 4.41.
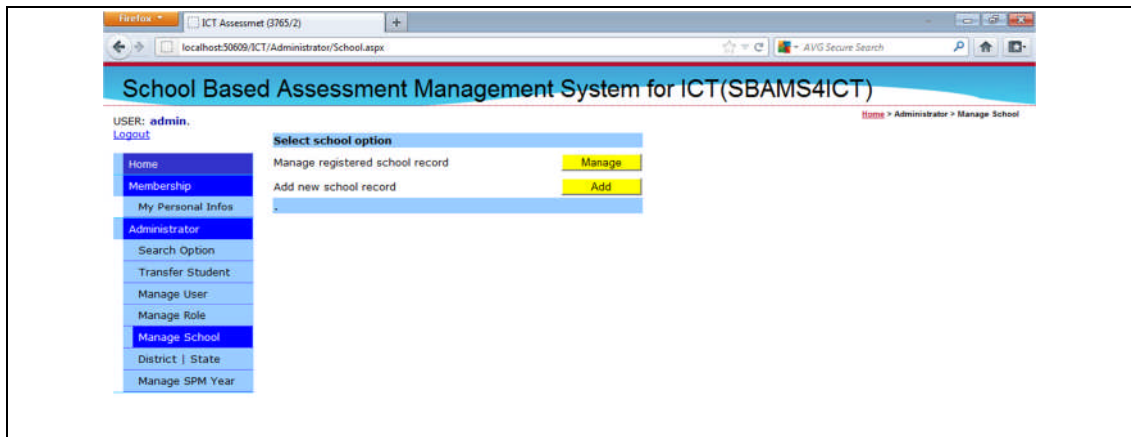
Figure 4.39: School Management Option
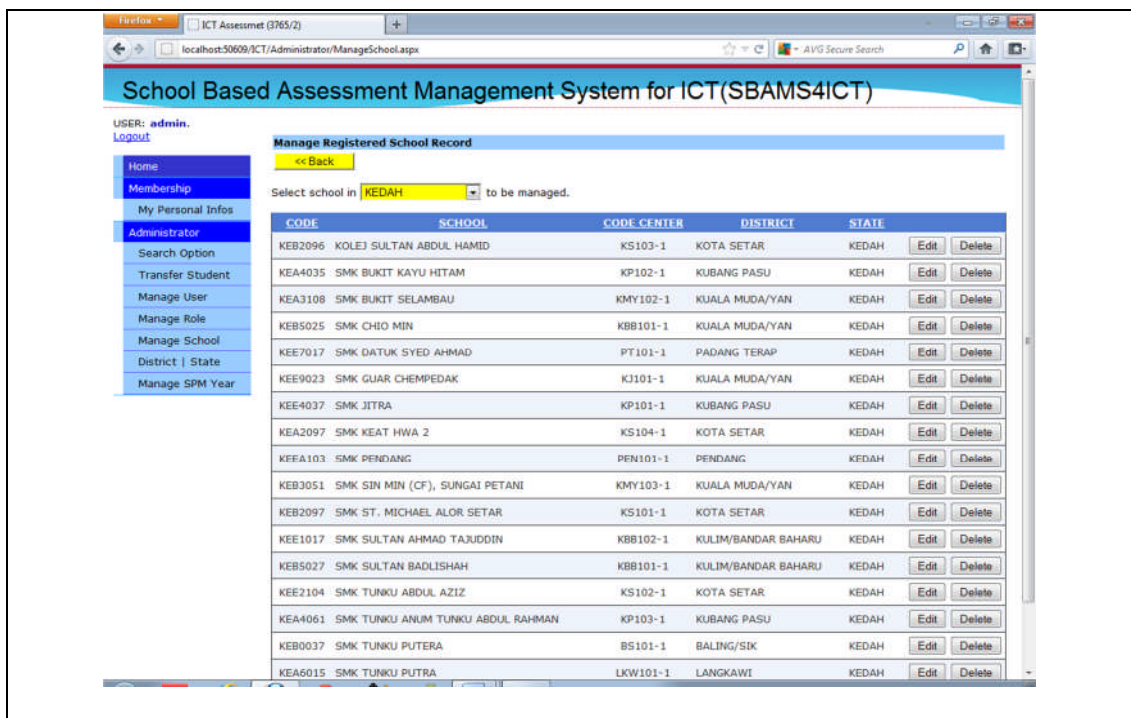
Figure 4.40: Manage Registered School's record
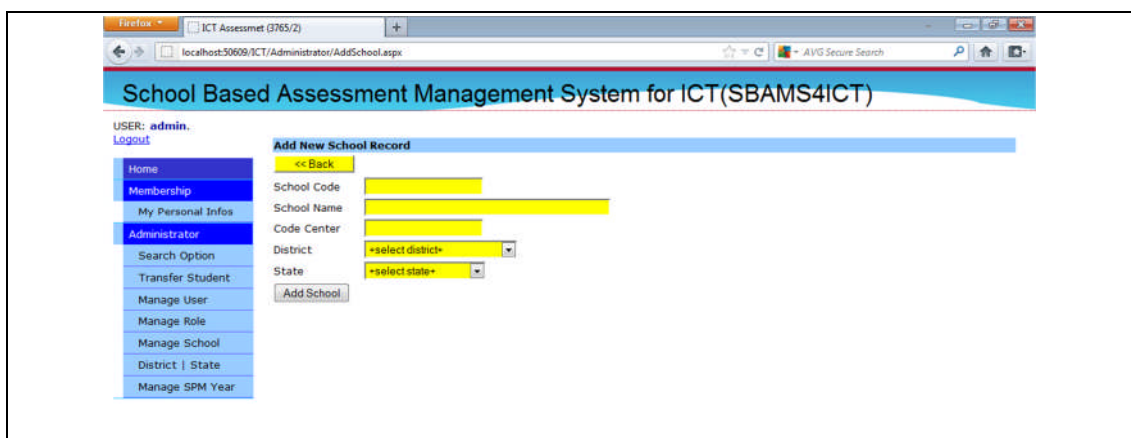
Figure 4.41: Adding New School's Record

Records on district and state could be managed by administrator through district and state management option. Figure 4.42 shows the mentioned option.
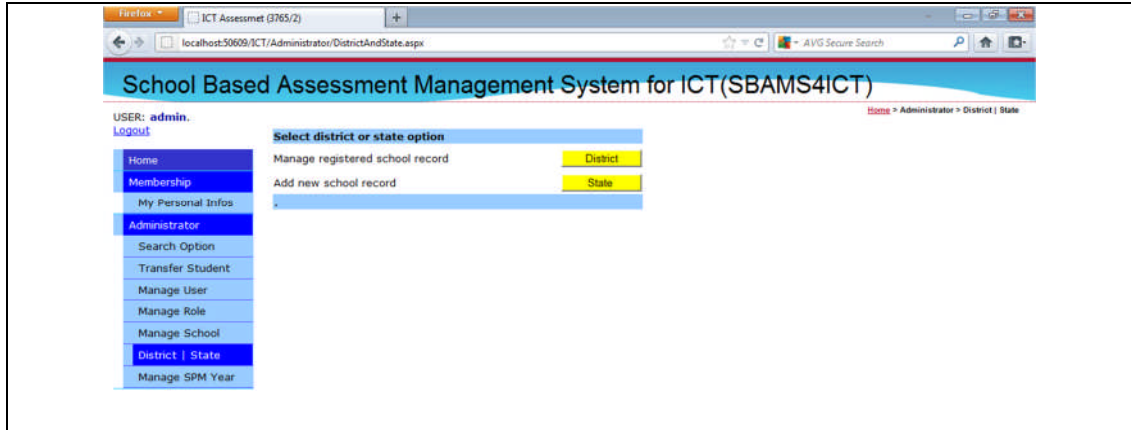
Figure 4.42: Managing District and State Option

The page for district and state management pages are shown through Figure 4.43 and Figure 4.44. Here, adding new records and removing a registered records for district and state could be implemeted by administrator through a easy to understand interfaces.
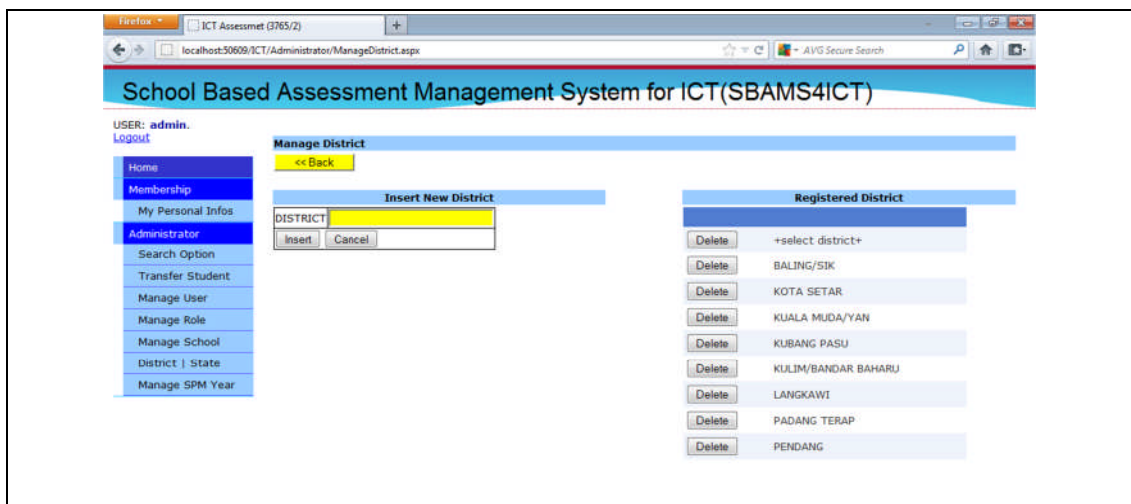
Figure 4.43: Manage District
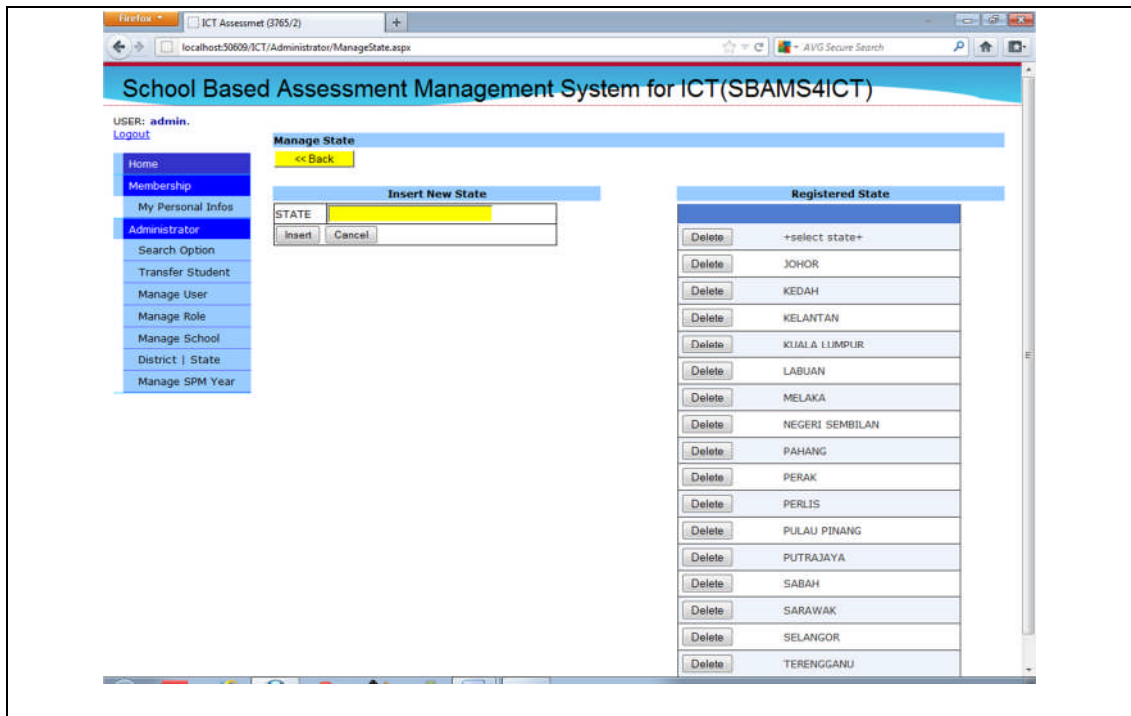
Figure 4.44: Manage State

Lastly, the option for administrator to manage the SPM year's record. Adding new SPM year and removing any registered year could be implemeted on this page. Figure 4.45 shows the page for SPM Year management.
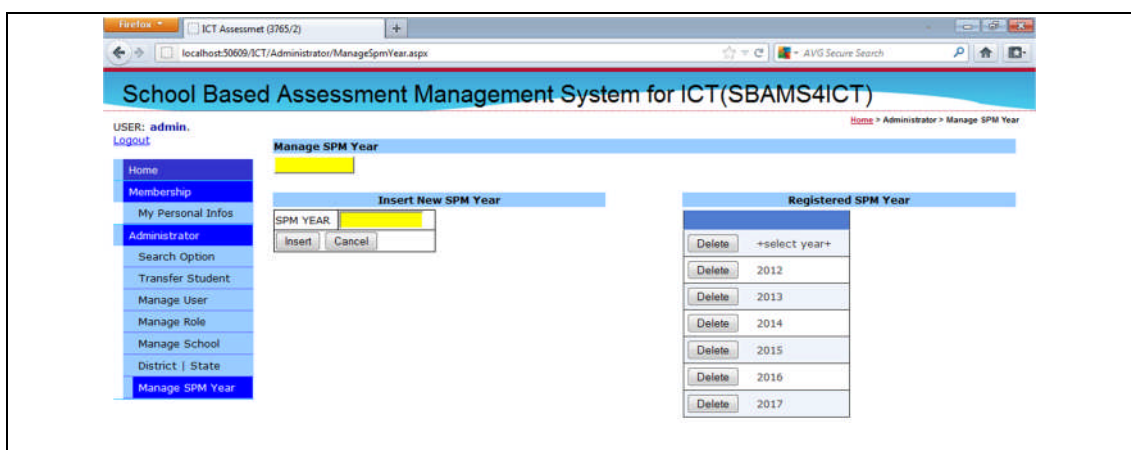
Figure 4.45: Manage SPM Year

4.4 Testing

Testing is intentionally to determine whether the system operates properly within expectations. Additionally, user involvement in testing sub-phase is also critical to

avoid any misunderstanding about what the new system will do and how it will do it. Test Script is used to perform the functionality test on the system. Errors found have been rectified. The outcome from this sub-phase is the accepted selected features prototype of the School Based Assessment Management System for ICT Subject.

4.4.1 Test Script

Test Script has been handed over to the users and they were asked to test the functionality of the system. Four (4) personnel from two (2) different school took part on this test. From SMK St. Michael, Alor Setar, there were one (1) school admin and one (1) assessor. Anyhow, the assessor from SMK St. Michael actually is the personnel whose been assigned by Kedah State Education Department as the Head Assessor for ICT Subject in Kedah. So, she was implementing the Test Script as an administrator as well. The other two (2) personnel are from SMK Guar Chempedak. One (1) assessor and one (1) school admin. Table 4.5 summarised the functional requirement tested. Appendix 9 shows a Test Script tested by the selected personnels.

Table 4.5: Numbers of Functional Requirement Tested

Respondents	Number of functional requirement tested
1 Administrator	46
2 School Admins	8
2 Assessors	29

4.5   Evaluation

PUEU test been implemented when the developed selected features prototype has been tested and finalised. The evaluation phase took place in SMK Guar Chempedak, during a two (2) days briefing on the current year assessment implementation by

Kedah State Education Department. Fifteen (15) assessors, four (4) school admins from a different school and one (1) administrator have been selected to evaluate the system developed. The questionnaire is distributed after they were asked to use the system prototype on their own under researcher's observation and guidance. Appendix 11 provides the questionnaire used.

Most of the evaluators are the first degree holder graduated from local university. 53% are male 47% are females evaluators. All assessors and administrator are from IT/ICT background, but as for school administrators, mostly from business administration and education academic background. More than 50% of the assessors have been in academic field for more than 10 years. All of assessors been teaching ICT Subject for more than 3 years.

Evaluation result been used to determine whether the developed system prototype, fullfilling the disignated objectives or not. PUEU consist of twelve questions with seven scale from unlikely to likely. To analyze the PUEU test, the descriptive analysis been used by utilizing Microsoft Excel 2010 application software. With this descriptive analysis the median and mode for the evaluation have been generated.

Evaluation results is divided into two (2) sections, The first section asked for demographic information and the other section asked about users' percieve toward developed system prototype. As for second section, it's been divided into two (2) parts. The first part is to grasp users' perceive on the usefulness of the system, contains six (6) questions, and the next part to get the information reagarding users' perceive on ease-of-use of the system, contains six (6) questions as well.

Table 4.6 and Table 4.7 show users' respond for the evaluation phase. As for the PUEU test, a 7-point Likert Scale anchored by "Unlikely" (1) and "Likely" (7) was used. Scale 1 to Scale 3 showing users' level of disagreement, Scale 4 showing their neutrality, and Scale 5 to Scale 7 shows the level of their agreement.

Based on the result, all users show their agreement on the usefulness and ease-of-use of the developed system prototype. The only differences are the level of their agreement. 65% users strongly agreed that the system is useful in their task implementation. This result shown in the finding on the Question 6 where the item tested is "*I would find the system useful in my job*". By comparing the level of their agreement on Perceive Usefulness, most response are on "Mostly" agree scale. As for Perceive Ease-of-Use, most of the users are agreed on the question asking for system's ease-of-use characteristic. This is shown by the result for Question 7 and Question 12 where 75% and 55% of them agreed on the questions asked.

Table 4.6: Perceive Usefulness Results from PUEU Test

	Disagreement			Neutral	Agreement		
	Strong	Mostly	Merely		Merely	Mostly	Strong
	1	2	3	4	5	6	7
Question 1					15% *(n=3)*	50% *(n=10)*	35% *(n=7)*
Question 2					35% *(n=7)*	45% *(n=9)*	20% *(n=4)*
Question 3					45% *(n=9)*	45% *(n=9)*	10% *(n=2)*
Question 4					10% *(n=2)*	65% *(n=13)*	25% *(n=5)*
Question 5					5% *(n=1)*	55% *(n=11)*	40% *(n=8)*
Question 6						35% *(n=7)*	65% *(n=13)*

n=20

	Disagreement			Neutral	Agreement		
	Strong	Mostly	Merely		Merely	Mostly	Strong
	1	2	3	4	5	6	7
Question 7						75% (n=15)	25% (n=5)
Question 8					10% (n=2)	65% (n=13)	25% (n=5)
Question 9					45% (n=9)	35% (n=7)	20% (n=4)
Question 10					25% (n=5)	50% (n=10)	25% (n=5)
Question 11					15% (n=3)	45% (n=9)	40% (n=8)
Question 12						55% (n=11)	45% (n=9)

n=20

Table 4.8 shows the descriptive analysis on Percieved Usefulness' result and Table 4.9 shows the descriptive analysis on Perceived Ease-of-Use's result.

Table 4.8: Descriptive Analysis of Perceived Usefulness

	Question 1	*Question 2*	*Question 3*	*Question 4*	*Question 5*	*Question 6*
Median	6	6	6	6	6	7
Mode	6	6	5	6	6	7

Table 4.9: Descriptive Analysis Perceived Ease-of-Use

	Question 7	*Question 8*	*Question 9*	*Question 10*	*Question 11*	*Question 12*
Median	6	6	6	6	6	6
Mode	6	6	5	6	6	6

Median is the score that been found in the middle of the set values. If the set value is even, then the number will be interpolate. Figure 4.46 show us the median from the PUEU test that been done in the project.
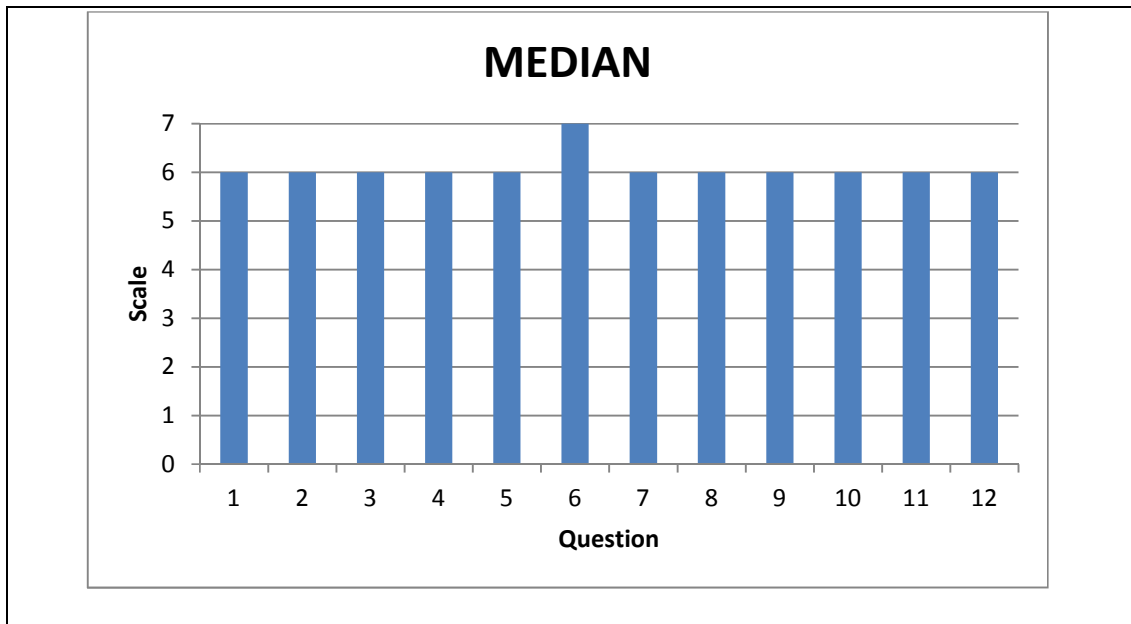
Figure 4.46: Median of PUEU Test

The median of every question is around 6 to 7. Actually, there are 11 questions got 6 for the median, and 1 question got 7. The highest median came from Question 6 (*I would find the system useful in my job*). The lowest median is on Question 7 where the question is about the operating of the system. Meaning, users showing their agreement in usefulness and ease-of-use of this system prototype. It could be concluded that most of the users found that this system could help them in their routine task implemetation.

Mode is the most frequent value that occur in the question. From the Figure 4.47, we can see the pattern of the mode that happen in the PUEU test.
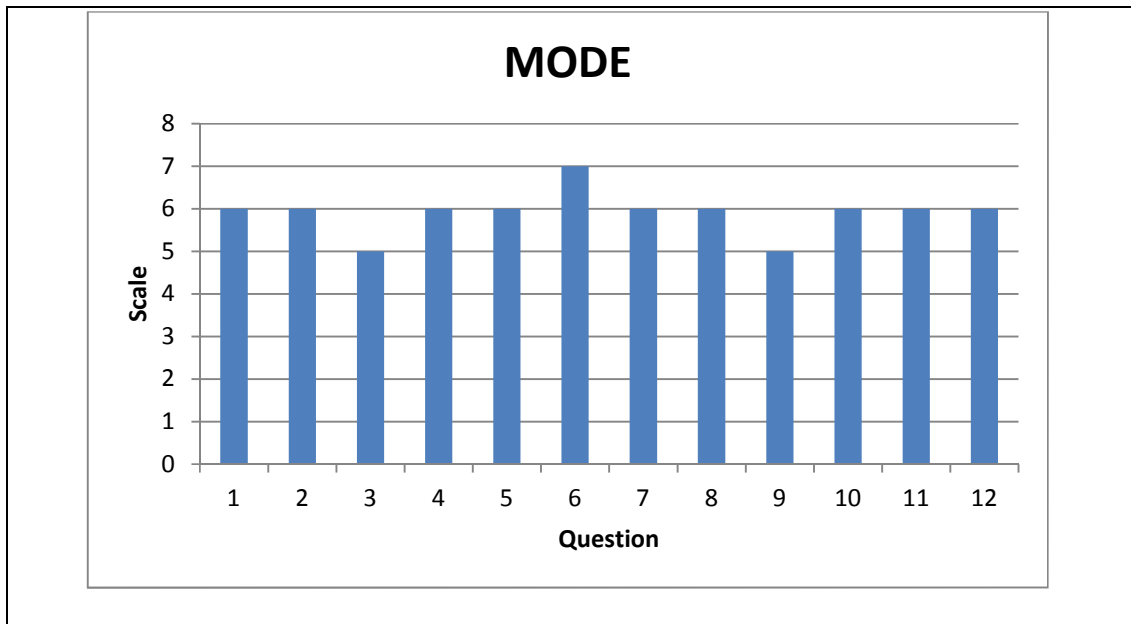
Figure 4.47: Mode of PUEU Test

In the test, most of the question got value 6. Two (2) question that got mode value 5, and only one (1) question got 7 for the mode value. Question 6, again got the highest value. As for now, it's been frequently accepted by users. This showing that, users really appreciate the usefulness of this system in their record management task. As most of them are the first timer in using this system, they are still developing their understanding while evaluating the system. This could be the reason why Question 3 and Question 9 got value 5 for its mode. Futhermore, since there is no such system being used by evaluators, their intention is more on doing the right things at an easy way. So, the productivity aspect is not much be considered while evaluating this system.

CHAPTER 5

CONCLUSION

5.1 Introduction

This chapter will discuss the final findings and conclude the findings based on the implemented project. Then the result will determine whether the objectives of the study is achieve or not.

5.2 Conclusion

This selected features prototype has been developed to achieved four main objectives. The first objective is to identify the users' requirements in developing a prototype of School Based Assessment Management System for ICT Subject. This objectives have been achieved through several implemeted methods; interviewing, document review and literature review. The explanation on the methods used and determined requirements could be located in Chapter 1, Chapter 2 and early part of Chapter 3.

The second objective is to develop a prototype of School Based Assessment Management System for ICT Subject. Methodology used, is the adaptation from (Denis, Wixom, & Tergarden, 2007), (Kendall & Kendall, 2011) and (Shelly & Rosenblatt, 2012). As for software development methodology, the Agile Software Development Methodology has been followed. The process iteration and the continous involvement of users in term of providing a feedback on developed system is the prominent aspect of this methodology. Users involvement reflect the quality of the delived selected features prototype. The explanation on second objective could be located on Chapter 3 and Chapter 4.

The third objective is concentrating on functionality testing of the developed prototype. The achievement of this objective been explained in Chapter 4. Test Script method has been used to achieve this objective. Minor adjustment have been implemented based on Test Script result and the the prototype was ready for the evaluation.

The last objective was focussing more on prototype evaluation. Perceived Usefulness and Ease-of-Use instrument has been used to achieve this objective. A group of 20 users been selected to implement this evaluation. Whenever the prototype been evaluated, the result shows that this system prototype is fullfiling user's requirement and easy to be used as well. The explanation on this achieved objective could be found in Chapter 4.

5.3   Contribution of the study

This study also give impact to the several party that involved in the developing a management system. From this project, researcher found that the most effected person is the developer and the Ministry of Education. The expectation from this project is, there will more usefull management system developed in order to assist and help assessors on the ground implementing their task. This is a must since the burden shouldered by teachers nowaday is on increasing pattern. Hopefully the prototype could promote the benefit of using ICT in educational management.

5.3.1   To System Developer

This project will be a guidelines for other developers to make a research and to develop a school based assessment management system in the future. The requirements also could be used as a refering model to the developers. They could also grasp some ideas on what users' interest in the school based assesment management system.

5.3.2   To Ministry Of Education

This project also would give some contribution to the Ministry of Education in Malaysia. From this project, they would realize the important of information technology utilization in educational management, specifically in managing students' school based assessment records at school level. The realiability of the web-based management system could deliver the outstanding result in education management in Malaysia. Assessors' on the ground could implement their task at the admireable level since there are no redundancy in performing their duty. The flow of the information could be channel to every single stakeholders within a few clicks. Students would be able to get their latest score through their registered email. This

capability could be extend to their parent as well, providing a clear and fresh records on their childs performance. The progress monitoring task could be executed by school admin at anytime and at anywhere. Providing an ample space for them to absorb and evaluate the information grasped. Then delivering their opinion and comment intend for scaling up the performance of their school.

5.4   Problems and Limitations

Since the beginning of the study there were several limitations and problem occurred through the process. The problems and limitations are listed as :

i.   The system is lack on graphic element since the skill constraints in graphic editing. Any graphic from other sources are bound to copyright act. Utilization of such graphics require rigid permission request process.

ii. The utilities provided for administrator are only suitable to handle a small number of users. If the system needs to provide the service for other additional states in Malaysia, there would be a reduce in productivity level on the administrator side. This is due to the programming level constraint on developer's side.

iii. The error handling message for record duplication and relational constraint in record removing option is utilizing default browser's messagging system. Again, this is due to programming constraint in providing a suitable error handling program.

5.5   Recommendations

Through out all the processes researcher found several item that could be enhanced. The recommendation for the future works are :

i. Fully developed management system which integration with the main database of Malaysia Examination Syndicate. Assessor don't have to re-enter student's record. Furthermore, the records from this system could be integrated into other system in Ministry of Education.

ii. Provide a better utilities for system administrator in order to expand the system capability in managing more records for more states in Malaysia.

iii. Expanding the system capability to handle other subjects offered which require school based assessment record management.

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APPENDICES

Appendix 1: Current Assessment Procedure

```
┌─────────────────────────────────────────┐
│       Teaching and Learning Process       │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ Candidate and assessor are ready for      │
│ assessment.                               │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ Assessment carried out based on the       │
│ aspect and criteria given. Refer to       │
│    • Table of Constructs                  │
│    • Assessment Checklist Form            │
│    • Written Assignment Format            │
│    • Report Form                          │
└─────────────────────────────────────────┘
                    │
                    ▼
             ◇ Candidate
               satisfied with  ──── No ────┐
               score? ◇                     │
                    │                       │
                   Yes    (loops back to Assessment box)
                    ▼
┌─────────────────────────────────────────┐
│ Assessor transfers candidate's score to   │
│ the Individual Score Form (ISF)           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ External Verifier verifies Individual     │
│ Score Form (ISF) of all candidates        │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ Assessor enters all the candidates'       │
│ scores into the Batch Score Form (BSF).   │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ Internal Verifier verifies Individual     │
│ Score Form (ISF) and Batch Score Form     │
│ (BSF)                                     │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ Internal Verifier verifies Batch Score    │
│ Form (BSF) of each center                 │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│ The Batch Score Form (BSF) is sent to JPN │
└─────────────────────────────────────────┘
```

NOTE: The scores for each candidate will be entered online by the Examination Secretary based on the Individual Score Form.

LEMBAGA PEPERIKSAAN
KEMENTERIAN PELAJARAN MALAYSIA

INDIVIDUAL SCORE FORM

INFORMATION AND COMMUNICATION TECHNOLOGY

YEAR _____

Name of Candidate	
Identity Card Number	
Index Number	

Code	Aspect	Score	Remarks
LA1.S01.1	Apply correct security procedures using antivirus		
LA1.S01.2	Apply correct security procedures using anti-spy ware		
LA1.S02.1	Locate and present information on impact of ICT and society		
LA2.S03.1	Assemble the components of a PC correctly		
LA2.S04.1	Install operating system, application software and utility programs		
LA2.S05.1	Explain the latest open source software available and the latest development in ICT		
LA3.S06.1	Crimp and test UTP cable		
LA3.S06.2	Configure and test network connection		
LA3.S07.1	Explain the latest development in networks and communications		
LA4.S08.1	Apply all the phases of multimedia production to produce an interactive educational multimedia project		
LA4.S09.1	Gather examples of immersive multimedia in education, business or entertainment		
LA5.S10.1	Apply program development phases to develop a problem-solving program		
LA5.S11.1	Collect information on the latest programming languages		
LA6.S12.1	Develop a database project		
LA6.S13.1	Find out current developments in computer information systems		
	TOTAL SCORE		

VERIFICATION

Assessor's Signature	Internal Verifier's Signature	External Verifier's Signature
Name	Name	Name
Date	Date	Date

BSF

LEMBAGA PEPERIKSAAN
KEMENTERIAN PELAJARAN MALAYSIA

BATCH SCORE FORM

INFORMATION AND COMMUNICATION TECHNOLOGY

CENTRE CODE: _____   SCHOOL CODE: _____   YEAR: _____

No	Index Number	Identity Card Number	Name	LA1	LA2	LA3	LA4	LA5	LA6	Score
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										

Assessor's Declaration

This is to certify that the ICT coursework scores have been awarded in accordance with the requirements of the syllabus and that every reasonable step has been taken to ensure that the work presented is the candidate's own work.

_____
Assessor's Signature

Name _____
Date _____

Internal Verifier's Declaration

I confirm that the assessor's declaration above is true

_____
Internal Verifier's Signature

Name _____
Date _____
School's Official Stamp

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LEMBAGA PEPERIKSAAN
KEMENTERIAN PELAJARAN MALAYSIA

INDIVIDUAL SCORE FORM

INFORMATION AND COMMUNICATION TECHNOLOGY

YEAR _____

RECORD OF SUBMISSION

Name of Candidate	
Identity Card Number	
Index Number	

Date of Submission/ Assessment	Construct Code	Aspect Code	Signature		Remarks
			Candidate	Assessor	

**LEMBAGA PEPERIKSAAN
KEMENTERIAN PELAJARAN MALAYSIA**

**INFORMATION AND COMMUNICATION TECHNOLOGY
3765/2**

SIJIL PELAJARAN MALAYSIA

YEAR: ....

COURSEWORK PORTFOLIO

Name of School	
Name of Candidate	
Identity Card Number	
Index Number	

Appendix 2: Questions for Assessor

1.   May I know your name and your post?

2.   For how many years have you been teaching ICT Subject?

3.   Could you give a brief explanation about this subject and related coursework?

4.   How do you manage the SBA Coursework record for ICT Subject?

5.   How do you monitor students' progress for their course works?

6.   What kind of approach do you used to manage those records?

7.   Does every ICT teacher use this approach?

8.   How students been inform about their current assessment progress?

9.   How internal verified monitor the progress of the assessment progress?

10.   Is there any Management Information System provided to help in managing the records?

10a.   If YES, could you tell me about the system?

10 b (i)   If NO, would you like to have this kind of system?

10 b (ii)   In your opinion, what are the features that this system should have?

Appendix 3: List of Requirements

Listed below are the functional requirements and non-functional requirement of the system. In the priority column, the following short hands are used:

- M – mandatory requirements (something the system must do)
- D – desirable requirements (something the system preferably should do)
- – optional requirements (something the system may do)

No	Requirement ID	Requirement Description	Priority
A. FUNCTIONAL REQUIREMENTS			
No	Requirement ID	Requirement Description	Priority
	SBAMS4ICT_01	**Registration (Administrator and Assessor)**	
1	SBAMA4ICT_01_01	Administrator and Assessor could register for new account.	M
2	SBAMA4ICT_01_02	User could cancel the registration by clicking on home link.	O
3	SBAMA4ICT_01_03	Message will be prompted if a blank field detected.	M
4	SBAMA4ICT_01_04	Message will be prompted if the username selected already been used.	M
5	SBAMA4ICT_01_05	Message will be prompted if the password and confirm password field are not match.	M
6	SBAMA4ICT_01_06	Message will be prompted if the email selected already been used.	M
7	**SBAMS4ICT_02**	**Log In System (Administrator, School Admin & Assessor)**	
8	SBAMA4ICT_02_01	User must enter username, password and email to login.	M
9	SBAMA4ICT_02_02	User could cancel the login by clicking on home link.	O
10	SBAMA4ICT_02_03	Message will be prompted if username, password and/or email are not match.	D
	SBAMS4ICT_03	**Manage Student**	
11	SBAMA4ICT_03_01	Assessor could edit registered student record.	M
12	SBAMA4ICT_03_02	Assessor could add new student record.	M
13	SBAMA4ICT_03_03	Assessor could return to previous page to select other option.	O
14	SBAMA4ICT_03_04	Assessor could delete registered student record.	D
15	SBAMA4ICT_03_05	Assessor could terminate process by pressing Cancel button.	D
16	SBAMA4ICT_03_06	Message will be prompted when no record found.	D
17	SBAMA4ICT_03_07	Message will be prompted when duplicate record entered.	M
18	SBAMA4ICT_03_08	Message will be prompted when blank field detected..	M
	SBAMS4ICT_04	**Manage Score**	
19	SBAMA4ICT_04_01	Assessor could edit student's score.	M

20	SBAMA4ICT_04_02	Assessor could terminate process by pressing Cancel button.	D
21	SBAMA4ICT_04_03	Assessor could send coursework assessment progress to registered student's email.	D
22	SBAMA4ICT_04_04	Message will be prompted when no record found.	D
	SBAMS4ICT_05	**Print Document**	
23	SBAMA4ICT_05_01	Assessor could print ISF forms.	M
24	SBAMA4ICT_05_02	Assessor could print BSF forms.	M
25	SBAMA4ICT_05_03	Assessor could print forms.	M
26	SBAMA4ICT_05_04	Assessor could print CWP forms.	M
27	SBAMA4ICT_05_05	Assessor could return to previous page to select other option.	O
28	SBAMA4ICT_05_06	Message will be prompted when no record found.	D
	SBAMS4ICT_06	**View Progress**	
29	SBAMA4ICT_06_01	School Admin could view coursework assessment progress of their school.	M
30	SBAMA4ICT_06_02	School Admin could change the SPM Year option to view others	M
31	SBAMA4ICT_06_03	School Admin could print individual coursework assessment progress of their student.	D
	SBAMS4ICT_07	**Search Record**	
32	SBAMA4ICT_07_01	Administrator could search record for Assessor.	D
33	SBAMA4ICT_07_02	Administrator could search record for Student.	D
34	SBAMA4ICT_07_03	Assessor could return to previous page to select other option.	O
35	SBAMA4ICT_07_04	Message will be prompted when no record found.	D
	SBAMS4ICT_08	**Reassign Student**	
36	SBAMA4ICT_08_01	Administrator could reassign student to a new assessor.	M
37	SBAMA4ICT_08_02	Assessor could terminate process by pressing Cancel link.	D
38	SBAMA4ICT_08_03	Message will be prompted when no record found.	D
	SBAMS4ICT_09	**Manage User**	
39	SBAMA4ICT_09_02	Administrator could manage user's details.	M
40	SBAMA4ICT_09_01	Administrator could manage user's status.	M
41	SBAMA4ICT_09_03	Administrator could manage user's roles.	M
42	SBAMA4ICT_09_04	Administrator could delete user.	D
43	SBAMA4ICT_09_05	Administrator could terminate process by pressing Cancel button.	D

44	SBAMA4ICT_09 _06	Administrator could unlock user.	M
45	SBAMA4ICT_09 _07	Administrator could return to previous page to select other option.	O
46	SBAMA4ICT_09 _08	Message will be display when user cannot be deleted.	M
	SBAMS4ICT_10	**Manage Role**	
47	SBAMA4ICT_10 _01	Administrator could manage roles for the system users.	M
48	SBAMA4ICT_10 _01	Administrator could delete registered role.	D
49	SBAMA4ICT_10 _01	Administrator could terminate process by pressing Cancel button.	D
50	SBAMA4ICT_10 _01	Message will be display when role entered already exist.	M
	SBAMS4ICT_11	**Manage School**	
51	SBAMA4ICT_11 _01	Administrator could edit registered school record.	M
52	SBAMA4ICT_11 _02	Administrator could add new school record.	M
53	SBAMA4ICT_11 _03	Administrator could return to previous page to select other option.	O
54	SBAMA4ICT_11 _04	Administrator could delete registered school record.	D
55	SBAMA4ICT_11 _05	Administrator could terminate process by pressing Cancel button.	O
56	SBAMA4ICT_11 _06	Message will be prompted when no record found.	D
57	SBAMA4ICT_11 _07	Message will be prompted when blank field detected.	M
58	SBAMA4ICT_11 _08	Message will be prompted when duplicate record entered.	M
59	SBAMA4ICT_11 _09	Message will be display when school cannot be deleted.	M
	SBAMS4ICT_12	**Manage District and State**	
60	SBAMA4ICT_12 _01	Administrator could add new district record.	M
61	SBAMA4ICT_12 _02	Administrator could add new state record.	M
62	SBAMA4ICT_12 _03	Administrator could return to previous page to select other option.	O
63	SBAMA4ICT_12 _04	Administrator could delete registered district record.	D
64	SBAMA4ICT_12 _05	Administrator could terminate process by pressing Cancel button.	O
65	SBAMA4ICT_12 _06	Administrator could delete registered state record.	D
66	SBAMA4ICT_12 _07	Message will be prompted when duplicate record entered.	M
67	SBAMA4ICT_12 _08	Message will be display when record cannot be deleted.	M
	SBAMS4ICT_13	**Manage SPM Year**	
68	SBAMA4ICT_13 _01	Administrator could add new SPM year record.	M

No.	Requirement ID	Requirement Description	Priority
69	SBAMA4ICT_13 _02	Administrator could delete registered SPM Year record.	D
70	SBAMA4ICT_13 _03	Administrator could terminate process by pressing Cancel button.	O
71	SBAMA4ICT_13 _04	Message will be prompted when duplicate record entered.	M
72	SBAMA4ICT_13 _05	Message will be display when record cannot be deleted.	M
	SBAMS4ICT_14	**Logout**	
73	SBAMA4ICT_14 _01	All users must logout from the system after using it.	O
74	SBAMA4ICT_14 _02	Administrator could terminate process by pressing Cancel button.	O

B. NON-FUNCTIONAL REQUIREMENTS			
No.	**Requirement ID**	**Requirement Description**	**Priority**
	SBAMS4ICT_15	**Reliability Issues**	
75	SBAMA4ICT_15 _01	The system should not crash more than one time per six hours	M
76	SBAMA4ICT_15 _02	If the system crash, it shoul be able to work normally after restarting.	M
	SBAMS4ICT_16	**Usability Issues**	
77	SBAMA4ICT_16 _01	Easy to use and does not need training.	M
	SBAMS4ICT_17	**Efficiency Issues**	
78	SBAMA4ICT_17 _01	Performance.	D
79	SBAMA4ICT_17 _02	Ability to search and retrieve data.	D
80	SBAMA4ICT_17 _03	Spacious.	D
81	SBAMA4ICT_17 _04	Support the system with large database.	D

Appendix 4: Use Case Specification

1   USE CASE: REGISTRATION (SBAMS4ICT_01)

Administrator   Register   Assessor

1.1   BRIEF DESCRIPTION

This use case allows assessor to register for a new account and for Administrator to register new account for School Admin.

1.2   PRE-CONDITIONS

The user launches the web browser and enters web address for the system. The homepage of the system will be displayed with registration link.

1.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

1.4   FLOW OF EVENTS

    1.4.1   Basic Flow   (SBAMS4ICT_01_01)

1.   This use case begins when user click on registration link on the system homepage.
2.   The system will display a registration form.
3.   The user will fill in the details on the first part of registration form (username, password, confirm password, email, security question, security answer)
        [A1: Click on Home Link]
4.   The user will click on create user button.
5.   The user will fill in the details on the second part of registration form (full name and phone number).
        [E1: Blank Field]
        [E2: Username Already In Use]
        [E3: Password and Confirm Password Not Match]
        [E4: Email Already In Use]
6.   The user will click on Next button.
7.   The system will display a message on successfully created account.
8.   The user will click on Continue button.
9.   The system will log the user into the system and prompting a user's default page.

    1.4.2   Alternative Flow

[A1: Click on Home Link]   (SBAMS4ICT_01_02)

1.   The user click on Home link.

2.   The page will redirect to anonymous default page.

.

1.4.3 Exceptional Flow

[E1: Blank Field]   (SBAMS4ICT _01_03)

1.   User needs to fill in every single field in registration page.

[E2: Username Already In Use]   (SBAMS4ICT _01_04)

1.   User needs to select other username, since the username entered already in use.

[E3: Password and Confirm Password Not Match]   (SBAMS4ICT _01_05)

1.   The Password and Confirm Password must be match. User needs to reenter a match input.

[E4: Email Already In Use]   (SBAMS4ICT _01_06)

1.   User needs to select other email address, since the address entered already in use.

1.5   POST-CONDITIONS

1.   User will be logged into the system.
2.   The system will display the default page for the registered user. Only Home link is enabled in Menu, since the user need to be assigned by an Administrator either as School Admin or Assessor.

1.6   RULE(S)

Not Applicable.

2 USE CASE: LOG IN SYSTEM (SBAMS4ICT_02)

2.1 BRIEF DESCRIPTION

This use case allows users (Administrator, School Admin and Assessor) to login into the system

2.2 PRE-CONDITIONS

The user launches the web browser and enters web address for the system. The homepage of the system will be displayed with login link. Then, the user clicks on the login link.

2.3 CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

2.4 FLOW OF EVENTS

2.4.1 Basic Flow   (SBAMS4ICT_02_01)

1.   This use case begins when user click on the Login link.
2.   The system will display a login form.
3.   The user will key in their username, password and email.
4.   The user will press Log In button.
        [A1: Click on Home Link]
5.   The system will log the user in the system and display the default page for registered user.
        [E1: Username, Password or Email Not Match]

2.4.2 Alternative Flow

[A1: Click on Home Link]   (SBAMS4ICT_02_02)

1.   The user click on Home link.

2.   The page will redirect to anonymous default page.

.
2.4.3 Exceptional Flow

[E1: Username, Password or Email Not Match]   (SBAMS4ICT_02_02)

1.   As the username, password or/and email provided by user are not match, the system will prompt a message and will ask the user to re-enter the username, password and email.

2.5 POST-CONDITIONS

1.   User will be able to log into the system.

2.   The system will display the default page for the registered user. The system will display the menu based on the content which could be accessed by user's role.

2.6   RULE(S)

1.   User's account must exist and role has been assigned.

3   USE CASE: MANAGE STUDENT (SBAMS4ICT_03)
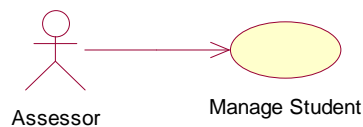
3.1   BRIEF DESCRIPTION
This use case allows assessor to manage the registered student's record and adding new student's record.

3.2   PRE-CONDITIONS
The assessor needs to be successfully logged in to the system.

3.3   CHARACTERISTIC OF ACTIVATION
Event-driven (on user's demand)

3.4   FLOW OF EVENTS
3.4.1   Basic Flow   (SBAMS4ICT_03_01)
1.   This use case begins when the assessor click on manage student link on system menu.
2.   The system will display a management option for student record.
3.   The assessor will click on manage button to manage registered student's record.
        [A1: Click on Add Button]
4.   The system will display a drop down menu for selecting student's SPM year.
5.   The assessor will select the SPM year.
        [A2: Click on Back Button]
6.   The system will display a list of registered students for the selected SPM year.
        [E1: No Record Found]
7.   The assessor will click on edit button.
        [A3: Click on Delete Button]
8.   The system will display an editable field for the selected student.
9.   The assessor will implement the editing on selected student's record.
10.   The assessor will click on update button.
        [A4: Click on Cancel Button]
11.   The system will save the record of the selected student.
12.   The system will display the updated list of registered student for the selected SPM year.

3.4.2   Alternative Flow
[A1: Click on Add Button]   (SBAMS4ICT_03_02)

1.   The assessor will click on add button.

2.   The system will display a form for adding new student's record.

3.   The assessor will fills in the required field.

4.   The assessor will click on add student button.

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[A2: Click on Back Button]

5.   The system will save new student's record.

      [E2: Duplicate Record]

      [E3: Blank Field]

[A2: Click on Back Button]   (SBAMS4ICT_03_03)

1.   The assessor will click on back button.

2.   The system will return to a previous page.

[A3: Click on Delete Button]   (SBAMS4ICT_03_04)

1.   The assessor will click on delete button.

2.   The system will display a confirmation message.

3.   The assessor click on OK button.

      [A4: Click on Cancel Button]

4.   The system will delete the record for the selected student.

5.   The system will display a fresh record of student for selected SPM year.

[A4: Click on Cancel Button] (SBAMS4ICT_03_05)

1.   The assessor click on cancel button.

2.   The system will terminate the process.

3.4.3   Exceptional Flow

[E1: No Record Found]   (SBAMS4ICT_03_06)

1.   The system will display a message whenever no record found for the selected SPM year.


[E2: Duplicate Record]   (SBAMS4ICT_03_07)

1.   The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY.

2.   The assessor click on browser's back button.

3.   The system will terminate the process.

[E3: Blank Field]   (SBAMS4ICT_03_08)

1.   User needs to fill in every single field in student's registration page.

3.5   POST-CONDITIONS

1.   Student's record within the system will be updated.

3.6   RULE(S)

User must be assigned with assessor's role.

4   USE CASE: MANAGE SCORE (SBAMS4ICT_04)

Assessor   Manage Score
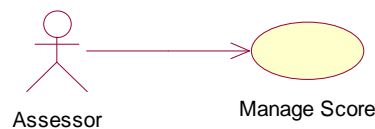
4.1   BRIEF DESCRIPTION

This use case allows assessor to manage the score for the registered student's.

4.2   PRE-CONDITIONS

The assessor needs to be successfully logged in to the system and the student's record must exist.

4.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

3.4   FLOW OF EVENTS

4.4.1   Basic Flow   (SBAMS4ICT_04_01)

1.   This use case begins when the assessor click on manage score link on system menu.
2.   The system will display a manage score page with a drop down menu for student's SPM year.
3.   The assessor select the SPM year.
4.   The system will display a list of registered students for the selected year.
         [E1: No Record Found]
5.   The assessor will click on select button for intended student.
6.   The system will display a score detail for selected student.
7.   The assessor will be able to update score, date and remark for the selected student.
8.   The assessor click on update button.
         [A1: Click on Cancel Button]
9.   The system will update the score detail for the selected student.
10.   The assessor click on done button.
         [A2: Click on Email Button]
11.   The system will return to the list of registered students for the selected year.

4.4.2   Alternative Flow

[A1: Click on Cancel Button]   (SBAMS4ICT_04_02)

1.   The assessor click on cancel button.
2.   The system will terminate the process.

[A2: Click on Email Button]   (SBAMS4ICT_04_03)

1.   The assessor will click on email button.
2.   The system will send the email to selected student and prompt a message to inform that the email has been sent.
3.   The assessor will click on OK button.

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3.4.3 Exceptional Flow

[E1: No Record Found]   **(SBAMS4ICT_04_04)**

1.   The system will display a message whenever no record found for the selected SPM year.

4.5   POST-CONDITIONS

1.   Student's score detail within the system will be updated.

4.6   RULE(S)

User must be assigned with assessor's role.

5 USE CASE: PRINT DOCUMENT (SBAMS4ICT_05)

Assessor — Print Document
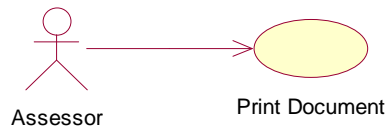
5.1 BRIEF DESCRIPTION
This use case allows assessor to print the coursework assessment's document.

5.2 PRE-CONDITIONS
The assessor needs to be successfully logged in to the system.

5.3 CHARACTERISTIC OF ACTIVATION
Event-driven (on user's demand)

5.4 FLOW OF EVENTS
5.4.1 Basic Flow   (SBAMS4ICT_05_01)
1. This use case begins when the assessor click on print option link on system menu.
2. The system will display a list of document type.
3. The assessor click on ISF button.

    [A1: Click on BSF Button]

    [A2: Click on ROS Button]

    [A3: Click on CWP Button]
4. The system will display a drop down menu for selecting student's SPM year.
5. The assessor select the SPM year.

    [A4: Click on Back Button]
6. The system will display a list of registered students for the selected year.

    [E1: No Record Found]
7. The assessor click on select button for intended student.

    [A4: Click on Back Button]
8. The system will display an ISF record for the selected student.
9. The assessor will click on print ISF button.

    [A4: Click on Back Button]
10. The printing process will start.

5.4.2 Alternative Flow
[A1: Click on BSF Button]   (SBAMS4ICT_05_02)

1. The assessor will click on BSF button.
2. The system will display a drop down menu for selecting student's SPM year.
3. The assessor select the SPM year.

    [A4: Click on Back Button]
4. The system will display a BSF record for the selected year.

    [E1: No Record Found]

5 The assessor will click on print BSF button.

    [A4: Click on Back Button]
6. The printing process will start.

[A2: Click on ROS Button]   (SBAMS4ICT_05_03)

1.   The assessor will click on ROS button.
2.   The system will display a drop down menu for selecting student's SPM year.
3.   The assessor select the SPM year.
      [A4: Click on Back Button]
4.   The system will display a list of registered students for the selected year.
      [E1: No Record Found]
5.   The assessor click on select button for intended student.
      [A4: Click on Back Button]
6.   The system will display an ROS record for the selected student.
7.   The assessor will click on print ROS button.
      [A4: Click on Back Button]
8.   The printing process will start.

[A3: Click on CWP Button]   (SBAMS4ICT_05_04)

1.   The assessor will click on CWP button.
2.   The system will display a drop down menu for selecting student's SPM year.
3.   The assessor select the SPM year.
      [A4: Click on Back Button]
4.   The system will display a list of registered students for the selected year.
      [E1: No Record Found]
5.   The assessor click on select button for intended student.
      [A4: Click on Back Button]
6.   The system will display an CWP record for the selected student.
7.   The assessor will click on print CWP button.
      [A4: Click on Back Button]
8.   The printing process will start.

[A4: Click on Back Button]   (SBAMS4ICT_05_05)
1.   The assessor will click on back button.
2.   The system will return to a previous page.

5.4.3   Exceptional Flow
[E1: No Record Found]   (SBAMS4ICT_05_06)
1.   The system will display a message whenever no record found for the selected SPM year.

5.5   POST-CONDITIONS
1.   The selected document will be printed.

5.6   RULE(S)
User must be assigned with assessor's role.

6   USE CASE: VIEW PROGRESS (SBAMS4ICT_06)

School Admin   View Progress

6.1   BRIEF DESCRIPTION

This use case allows school admin to monitor and view the progress of coursework assessment for his school.

6.2   PRE-CONDITIONS

The school admin needs to be successfully logged in to the system.

6.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

6.4   FLOW OF EVENTS

6.4.1   Basic Flow   (SBAMS4ICT_06_01)

1.   This use case begins when the school admin click on view progress link on system menu.

2.   The system will display a student's progress record for earliest registered year for the coursework assessment progress.

3.   The school admin will click on select button.

        [A1: Change the SPM Year Option]

4.   The system will display a student's progress record for the selected SPM year.

5.   The school admin will click on select button for intended student.

6.   The system will display a detail personal progress record for the selected student

7.   The school admin will click on back button.

        [A2: Click on Print Button]

8.   The system will return to a previous page.

6.4.2   Alternative Flow

[A1: Change the SPM Year Option]   (SBAMS4ICT_06_02)

1.   The school admin change the SPM year option from drop down menu.

2.   The system will display a student's progress record for the selected SPM year

[A2: Click on Print Button]   (SBAMS4ICT_06_03)

1.   The school admin will click on print button.

2.   The printing process will start.

6.4.3   Exceptional Flow

        Not applicable

6.5   POST-CONDITIONS

1.   Student's progress will be reviewed and printed.

6.6   RULE(S)

User must be assigned with school admin's role.

7   **USE CASE: SEARCH RECORD (SBAMS4ICT_07)**

Administrator   Search Record

7.1   BRIEF DESCRIPTION
This use case allows administrator to search record for registered assessors and students.

7.2   PRE-CONDITIONS
The administrator needs to be successfully logged in to the system.

7.3   CHARACTERISTIC OF ACTIVATION
Event-driven (on user's demand)

7.4   FLOW OF EVENTS

7.4.1   Basic Flow   (SBAMS4ICT_07_01)

1.   This use case begins when the administrator click on search option link on system menu.
2.   The system will display a search category page.
3.   The administrator will click on assessor button to search record for registered assessors' record.
       [A1: Click on Student Button]
4.   The system will display a search option page for assessor.
5.   The administrator will select the search by option.
6.   The administrator will enter an appropriate search keyword.
       [A2: Click on Back Button]
7.   The administrator will click on search button.
8.   The system will display a search result based on search by option.
       [E1: No Record Found]

7.4.2   Alternative Flow

[A1: Click on Student Button] (SBAMS4ICT_07_02)

1.   The administrator will click on student button to search record for registered students' record.

2.   The system will display a search option page for student.
3.   The administrator will select the search by option.
4.   The administrator will enter an appropriate search keyword.
       [A2: Click on Back Button]
5.   The administrator will click on search button.
6.   The system will display a search result based on search by option.
       [E1: No Record Found]

[A2: Click on Back Button]   (SBAMS4ICT_07_03)
1.   The assessor will click on back button.
2.   The system will return to a previous page.

7.4.3   Exceptional Flow
[E1: No Record Found]   (SBAMS4ICT_07_04)
1.   The system will display a message whenever no record found for the search by option and keyword.

7.5   POST-CONDITIONS
1.   Registered assessors' and student's record within the system will be displayed based on search by option and keyword..

7.6   RULE(S)
User must be assigned with administrator's role.

8   USE CASE: REASSIGN STUDENT (SBAMS4ICT_08)

Administrator   Reassign Student

8.1   BRIEF DESCRIPTION

This use case allows administrator to reassign student to a new assessors. This use case will be used when a student transfer to other school.

8.2   PRE-CONDITIONS

The administrator needs to be successfully logged in to the system.

8.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

8.4   FLOW OF EVENTS

8.4.1   Basic Flow   (SBAMS4ICT_08_01)

1. This use case begins when the administrator click on transfer student link on system menu.
2. The system will display a reassign student page.
3. The administrator will select a state from drop down menu.
4. The administrator will select student's previous school name from a drop down menu.
5. The system will display a list of combination result.
   [E1: No Record Found]
6. The administrator will click on edit link on intended student.
7. The system will display an editable field for the selected student.
8. The administrator will assign new assessor by changing the previous assessor ID to new assessor ID.
9. The administrator will click on update link.
   [A1: Click on Cancel Link]
10. The system will update the student and assessor assignment.
11. The system will display the updated list of student and assessor assignment.

8.4.2   Alternative Flow

[A1: Click on Cancel Link]   (SBAMS4ICT_08_02)

1. The assessor click on cancel button.
2. The system will terminate the process.

8.4.3   Exceptional Flow

[E1: No Record Found]   (SBAMS4ICT_08_03)

1. The system will display a message whenever no record found for the state and school combination.

8.5   POST-CONDITIONS

1. Registered student will be assigned to a new registered assessor.

8.6   RULE(S)

User must be assigned with administrator's role.

9   USE CASE: MANAGE USER (SBAMS4ICT_09)

Administrator   Manage User

9.1   BRIEF DESCRIPTION

This use case allows administrator to manage the registered users' record for the system.

9.2   PRE-CONDITIONS

The administrator needs to be successfully logged in to the system.

9.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

9.4   FLOW OF EVENTS

9.4.1   Basic Flow   (SBAMS4ICT_09_01)

1.   This use case begins when the administrator click on manage user link on system menu.
2.   The system will display a page for users' record management option.
3.   The administrator will click on details button to manage registered users' details.
         [A1: Click on Status Button]
         [A2: Click on Roles Button]
4.   The system will display a page for users' details management.
5.   The administrator will click on edit button.
         [A3: Click on Delete Button]
6.   The system will display an editable field for the selected user.
7.   The administrator will implement the editing on selected school's record.
8.   The administrator will click on update button.
         [A4: Click on Cancel Button]
9.   The system will save the user's record.
10   The system will display the updated records.

9.4.2   Alternative Flow

[A1: Click on Status Button]   (SBAMS4ICT_09_02)

1.   The administrator will click on status button.

2.   The system will display a page for users' status management.

3.   The administrator will click on manage link

4.   The system will display a page for updating user's status

5.   The administrator will update approved option.

         [A5: Click on Unlock User Button]
         [A6: Click on Back Button]

6.   The system will update the approved status for the selected user.

7.   The system will display the update message.

[A2: Click on Roles Button]   **(SBAMS4ICT_09_03)**

1.   The administrator will click on roles button.

2.   The system will display a page for users' roles management.

3.   The administrator will update users' roles.

4.   The system will update the roles for the selected user.

5.   The system will display the updated users' roles record.

[A3: Click on Delete Button]   (SBAMS4ICT_09_04)
1.   The administrator will click on delete button.
2.   The system will display a confirmation message.
3.   The administrator click on OK button.
        [A4: Click on Cancel Button]
4.   The system will delete the record of the selected user.
        [E1: Unable to Delete]
5.   The system will display an updated list of registered users.

[A4: Click on Cancel Button]   (SBAMS4ICT_09_05)
1.   The administrator click on cancel button.
2.   The system will terminate the process.

[A5: Click on Unlock User Button]   (SBAMS4ICT_09_06)
1.   The administrator will click on unlock user button.
2.   The system will update the unlock status of the user.

[A6: Click on Back Button]   (SBAMS4ICT_09_07)
1.   The administrator will click on back button.
2.   The system will return to a previous page.

9.4.3   Exceptional Flow
[E1: Unable to Delete] (SBAMS4ICT_09_08)

1.   The system will display a message whenever the record is unable to be
        deleted. This occurred because The DELETE statement conflicted with the
        REFERENCE constraint.

2.   The administrator click on browser's back button.

9.5   POST-CONDITIONS
1.   User's record within the system will be updated.

9.6   RULE(S)
User must be assigned with administrator's role.

10   USE CASE: MANAGE ROLE (SBAMS4ICT_10)

Administrator   Manage Role

10.1   BRIEF DESCRIPTION

This use case allows administrator to manage the roles for the system's users.

10.2   PRE-CONDITIONS

The administrator needs to be successfully logged in to the system.

10.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

10.4   FLOW OF EVENTS

10.4.1   Basic Flow   (SBAMS4ICT_10_01)

1.   This use case begins when the administrator click on manage role link on system menu.
2.   The system will display a manage role page.
3.   The administrator will key in new role name into provided field.
        [A1: Click on Delete Role Button]
4.   The administrator will click on create role button.
5.   The system will create the new role.
        [E1: Role Already Exist]
6.   The system will display the updated list of registered roles.

10.4.2   Alternative Flow

[A1: Click on Delete Role Button]   (SBAMS4ICT_10_02)

1.   The administrator click on delete role button to delete intended role.
2.   The confirmation on deletion will be displayed.
3.   The administrator click on OK button.
        [A2: Click on Cancel Button]
4.   The system will delete the selected record.

[A2: Click on Cancel Button]   (SBAMS4ICT_10_03)

1.   The assessor click on cancel button.
2.   The system will terminate the process.

10.4.3   Exceptional Flow

[E1: Role Already Exist]   (SBAMS4ICT_10_04)

1.   The system will display an error message mentioning role already exist.
2.   The system will terminate the process.

10.5   POST-CONDITIONS

1.   The record for role within the system will be updated.

10.6   RULE(S)

User must be assigned with administrator's role.

11   USE CASE: MANAGE SCHOOL (SBAMS4ICT_11)

Administrator   Manage School

11.1   BRIEF DESCRIPTION

This use case allows administrator to manage the registered school's record and adding new school's record.

11.2   PRE-CONDITIONS

The administrator needs to be successfully logged in to the system.

11.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

11.4   FLOW OF EVENTS

11.4.1 Basic Flow   (SBAMS4ICT_11_01)

1.   This use case begins when the administrator click on manage school link on system menu.
2.   The system will display a page for a school record management option.
3.   The administrator will click on manage button to manage registered school's record.
        [A1: Click on Add Button]
4.   The system will display a drop down menu for selecting a state for registered school.
5.   The administrator will select the state.
        [A2: Click on Back Button]
6.   The system will display a list of registered schools for the selected state.
        [E1: No Record Found]
7.   The administrator will click on edit button.
        [A3: Click on Delete Button]
8.   The system will display an editable field for the selected school.
9.   The administrator will implement the editing on selected school's record.
10.   The administrator will click on update button.
        [A4: Click on Cancel Button]
11.   The system will save the fresh record of the selected school.
12.   The system will display the updated school record.

11.4.2 Alternative Flow

[A1: Click on Add Button]   (SBAMS4ICT_11_02)

1.   The administrator will click on add button.

2.   The system will display a form for adding new school's record.

3.   The assessor will fills in the required field.

        [A2: Click on Back Button]

4.   The administrator will click on add school button.

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5. The system will save new school's record.

[E2: Blank Field]

[E3: Duplicate Record]

[A2: Click on Back Button]   (SBAMS4ICT_11_03)

1. The administrator will click on back button.
2. The system will return to a previous page.

[A3: Click on Delete Button]   (SBAMS4ICT_11_04)

1. The administrator will click on delete button.
2. The system will display a confirmation message.
3. The administrator click on OK button.

[A4: Click on Cancel Button]

4. The system will delete the record of the selected school.

[E4: Unable to Delete]

5. The system will display an updated list of registered schools.

[A4: Click on Cancel Button] (SBAMS4ICT_11_05)

1. The administrator click on cancel button.
2. The system will terminate the process.

11.4.3 Exceptional Flow

[E1: No Record Found]   (SBAMS4ICT_11_06)

1. The system will display a message whenever no school record found for the selected state.

[E2: Blank Field]   (SBAMS4ICT_11_07)

1. Administrator needs to fill in every single field in school registration page.

[E3: Duplicate Record]   (SBAMS4ICT_11_08)

1. The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY.
2. The assessor click on browser's back button.
3. The system will terminate the process.

[E4: Unable to Delete] (SBAMS4ICT_11_09)

1. The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint.
2. The administrator click on browser's back button.
3. The system will terminate the process.

11.5 POST-CONDITIONS

1. School's record within the system will be updated.

11.6 RULE(S)

User must be assigned with administrator's role.

12   USE CASE: MANAGE DISTRICT AND STATE (SBAMS4ICT_12)

Administrator   Manage District and State
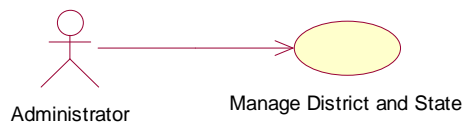
12.1   BRIEF DESCRIPTION

This use case allows administrator to manage the district and state record for the system.

12.2   PRE-CONDITIONS

The administrator needs to be successfully logged in to the system.

12.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

12.4   FLOW OF EVENTS

12.4.1   Basic Flow   (SBAMS4ICT_12_01)

1.   This use case begins when the administrator click on district | state link on system menu.
2.   The system will display a management option for district and state record.
3.   The administrator will click on district button to manage district's record.
      [A1: Click on State Button]
4.   The system will display a manage district page.
5.   The administrator will key in new district record into provided field.
      [A2: Click on Back Button]
      [A3: Click on Delete District Button]
6.   The administrator will click on insert button.
      [A4: Click on Cancel Button]
7.   The system will save new district record.
      [E1: Duplicate Record]
8.   The system will display the updated list of registered district.

12.4.2   Alternative Flow

[A1: Click on State Button]   (SBAMS4ICT_12_02)

1.   The administrator will click on state button to manage state's record.

2.   The system will display a manage state page.
5.   The administrator will key in new state record into provided field.
      [A2: Click on Back Button]
      [A5: Click on Delete State Button]
6.   The administrator will click on insert button.
      [A3: Click on Cancel Button]
7.   The system will save new state record.
      [E1: Duplicate Record]
8.   The system will display the updated list of registered state.

[A2: Click on Back Button]   (SBAMS4ICT_12_03)
1.   The assessor will click on back button.
2.   The system will return to a previous page.

[A3: Click on Delete District Button] (SBAMS4ICT_12_04)
1.   The administrator click on delete button to delete intended district.
2.   The confirmation on deletion will be displayed.
3.   The administrator click on OK button.
        [A4: Click on Cancel Button]
4.   The system will delete the selected record.
        [E2: Unable to Delete]

[A4: Click on Cancel Button]   (SBAMS4ICT_12_05)
1.   The assessor click on cancel button.
2.   The system will terminate the process.

[A5: Click on Delete State Button]   (SBAMS4ICT_12_06)
1.   The administrator click on delete button to delete intended state.
2.   The confirmation on deletion will be displayed.
3.   The administrator click on OK button.
        [A4: Click on Cancel Button]
4.   The system will delete the selected record.
        [E2: Unable to Delete]

12.4.3   Exceptional Flow

[E1: Duplicate Record]   (SBAMS4ICT_12_07)
1.   The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY.
2.   The assessor click on browser's back button.
3.   The system will terminate the process.

[E1: Unable to Delete] (SBAMS4ICT_12_08)

1.   The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint.

2.   The administrator click on browser's back button.

3.   The system will terminate the process.

12.5   POST-CONDITIONS
1.   The record for district and state within the system will be updated.

12.6   RULE(S)
User must be assigned with administrator's role.

13   USE CASE: MANAGE SPM YEAR (SBAMS4ICT_13)

Administrator   Manage SPM Year

13.1   BRIEF DESCRIPTION
This use case allows administrator to manage the SPM year record for the system.

13.2   PRE-CONDITIONS
The administrator needs to be successfully logged in to the system.

13.3   CHARACTERISTIC OF ACTIVATION
Event-driven (on user's demand)

13.4   FLOW OF EVENTS
13.4.1 Basic Flow   (SBAMS4ICT_13_01)
1.   This use case begins when the administrator click on manage SPM year link on system menu.
2.   The system will display a manage SPM year page.
3.   The administrator will key in new SPM year record into provided field.
         [A1: Click on Delete Button]
4.   The administrator will click on insert button.
         [A2: Click on Cancel Button]
5.   The system will save new SPM year record.
         [E1: Duplicate Record]
6.   The system will display the updated list of registered SPM year.

13.4.2 Alternative Flow
[A1: Click on Delete Button]   (SBAMS4ICT_13_02)
1.   The administrator click on delete button to delete intended SPM year.
2.   The confirmation on deletion will be displayed.
3.   The administrator click on OK button.
         [A2: Click on Cancel Button]
4.   The system will delete the selected record.
         [E2: Unable to Delete]

[A2: Click on Cancel Button]   (SBAMS4ICT_13_03)
1.   The assessor click on cancel button.
2.   The system will terminate the process.

12.4.3 Exceptional Flow
[E1: Duplicate Record]   (SBAMS4ICT_13_04)
1.   The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY.
2.   The assessor click on browser's back button.

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3. The system will terminate the process.

[E2: Unable to Delete] (SBAMS4ICT_13_05)

1. The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint.
2. The administrator click on browser's back button.
3. The system will terminate the process.

13.5   POST-CONDITIONS
1. The record for SPM year within the system will be updated.

13.6   RULE(S)
User must be assigned with administrator's role.

14.   USE CASE: LOGOUT (SBAMS4ICT_10)
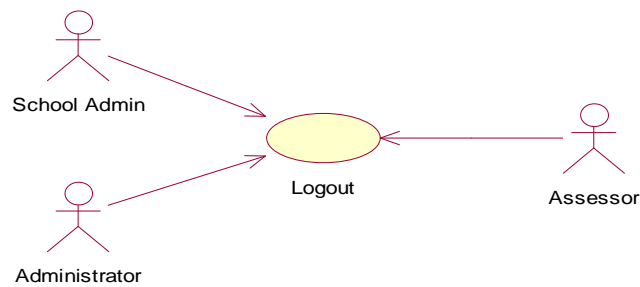
14.1   BRIEF DESCRIPTION

This use case enables administrator, school admin or assessor to logout from the system.

14.2   PRE-CONDITIONS

Administrator, school admin or assessor need to be successfully logged into the system.

14.3   CHARACTERISTIC OF ACTIVATION

Event-driven (on user's demand)

14.4   FLOW OF EVENTS

14.4.1   Basic Flow   (SBAMS4ICT_14_01)

1.   This use case begins when the administrator, school admin or assessor click on logout link from the system menu.

2.   The system will display the confirmation message.

3.   The administrator, school admin or assessor will press OK button.

    [A1: Press Cancel Button]

4.   The system will log off the administrator, school admin or assessor.

5.   The system will be redirected to the system homepage.

14.4.2   Alternative Flow

[A1: Press Cancel Button]   (SBAMS4ICT _14_02)

1.   The administrator, school admin or assessor press cancel button.

2.   The system will terminate the process

14.4.3   Exceptional Flow

Not applicable.

14.5 POST CONDITION

1. The system will log off the administrator, school admin or assessor.

2. The system will be redirected to the anonymous default page.

14.6 RULES

1. The administrator, school admin or assessor must successfully log into the system in order to enable this use case.

Appendix 5: Activity Diagram

1 ACTIVITY DIAGRAM: REGISTRATION (SBAMS4ICT_01_01)
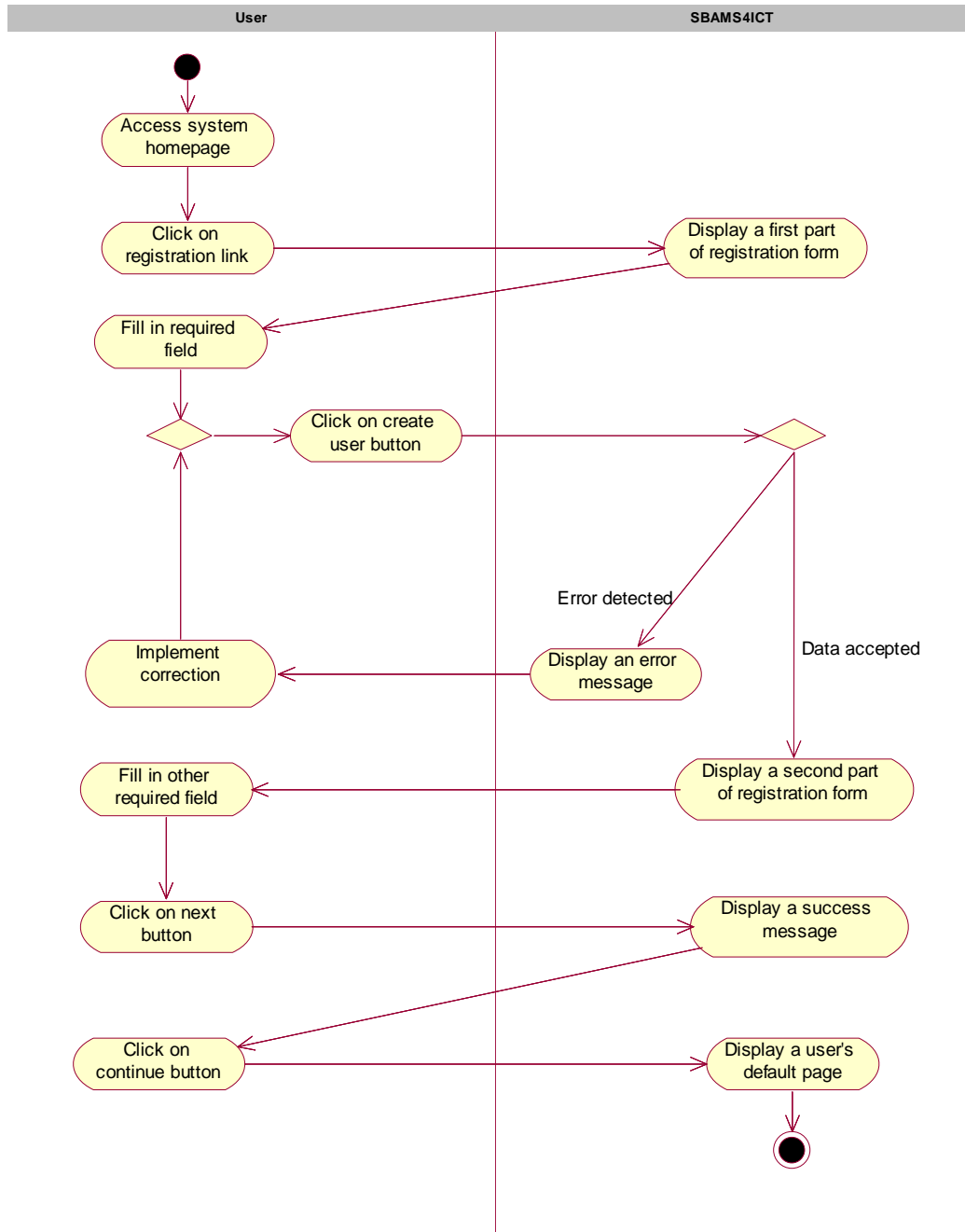
2 ACTIVITY DIAGRAM: LOGIN (SBAMS4ICT_02_01)
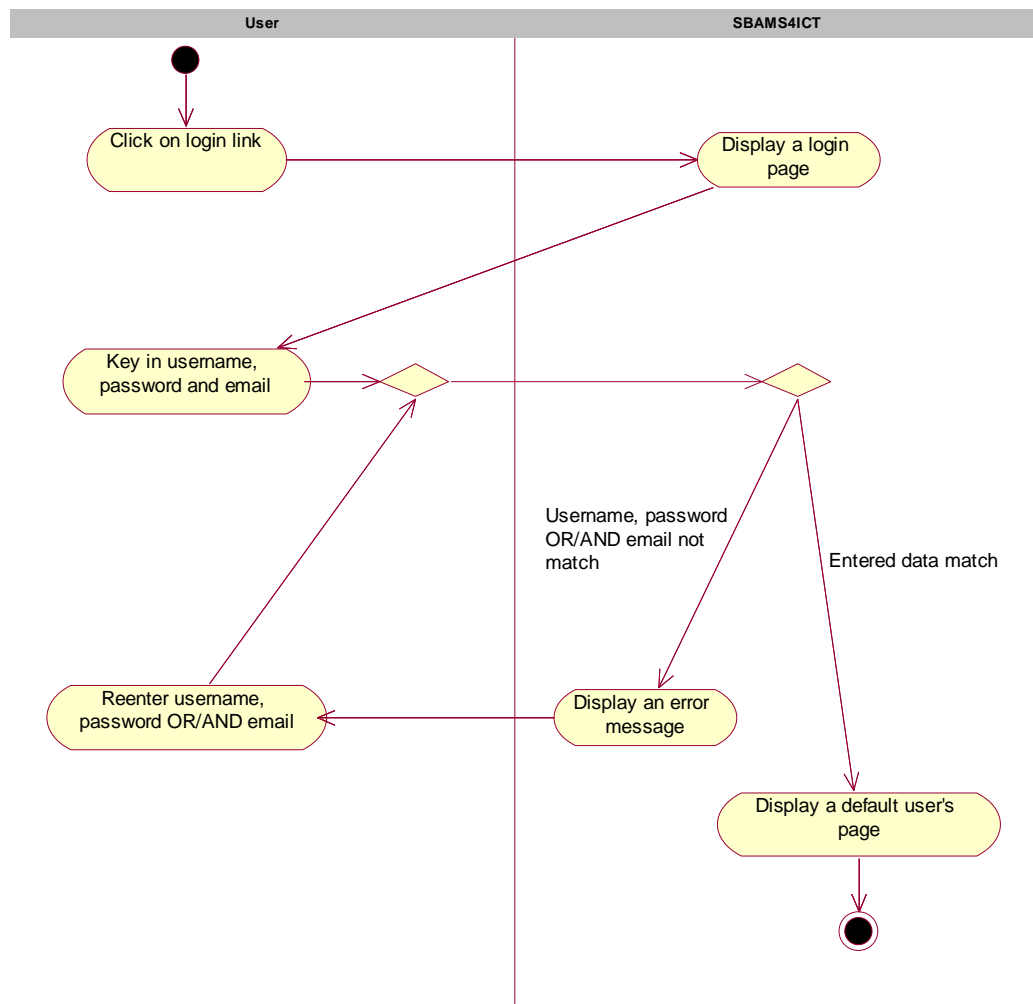
3   ACTIVITY DIAGRAM: MANAGE STUDENT (SBAMS4ICT_03_01)

Assessor	SBAMS4ICT

Click on manage student link

Display an option for manage student

Click on manage button

Display a page with drop down menu for SPM year selection

Display no record found message

No record found

Select SPM year

Record found

Display a list of registered student for selected SPM year

Click on delete button

Display a confirmation message

Delete the selected student record

Click on OK button

Display a list of updated student record for the selected SPM year

Click on cancel button

Click on edit button

Terminate process

Display an editable field for selected student

Edit intended field

Click on update button

Save the record

Display an updated list of registered student for selected SPM year

Click on cancel button

Terminate process

3   ACTIVITY DIAGRAM: ADD STUDENT (SBAMS4ICT_03_02)

4   ACTIVITY DIAGRAM: MANAGE SCORE (SBAMS4ICT_04_01)
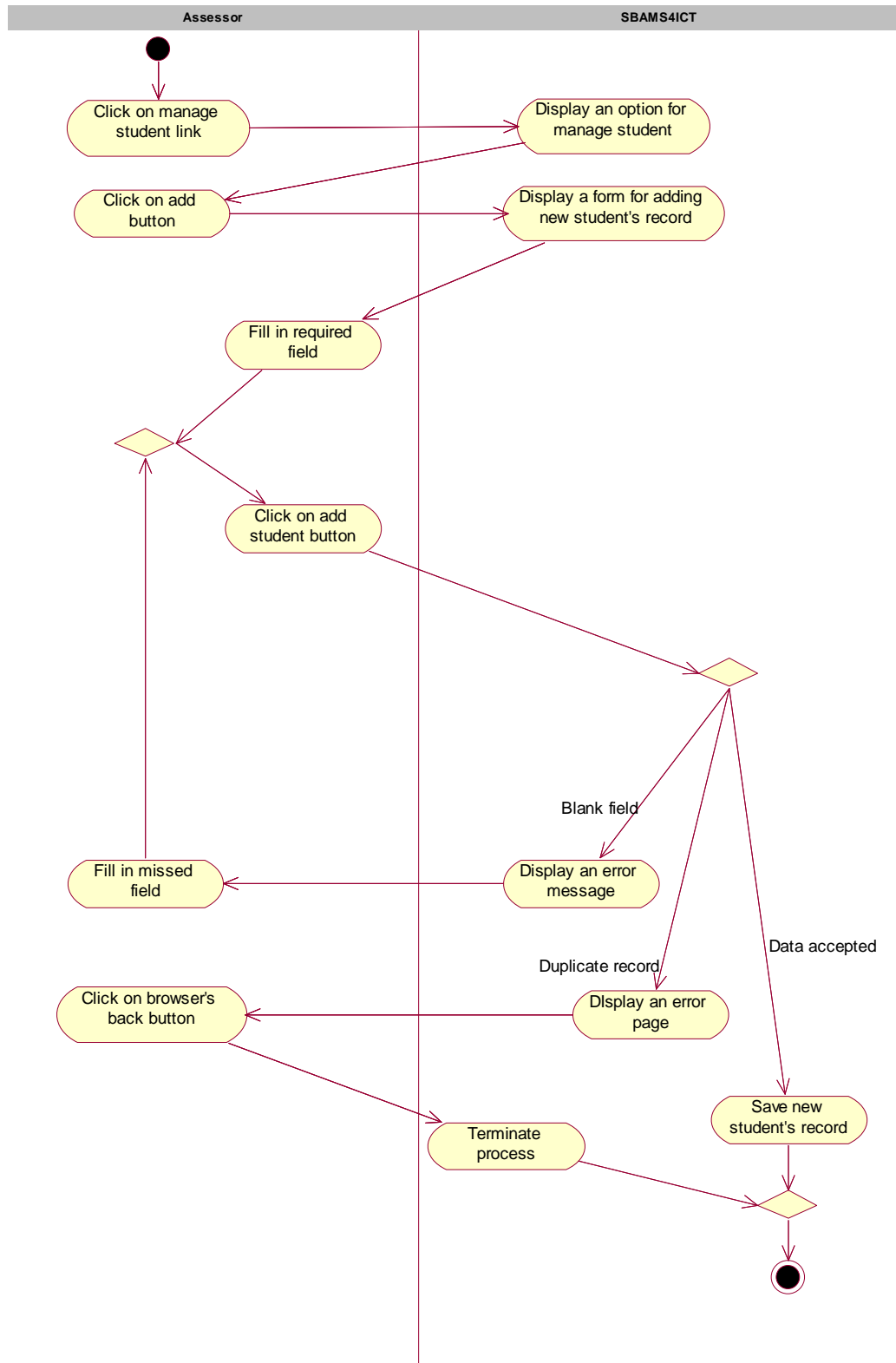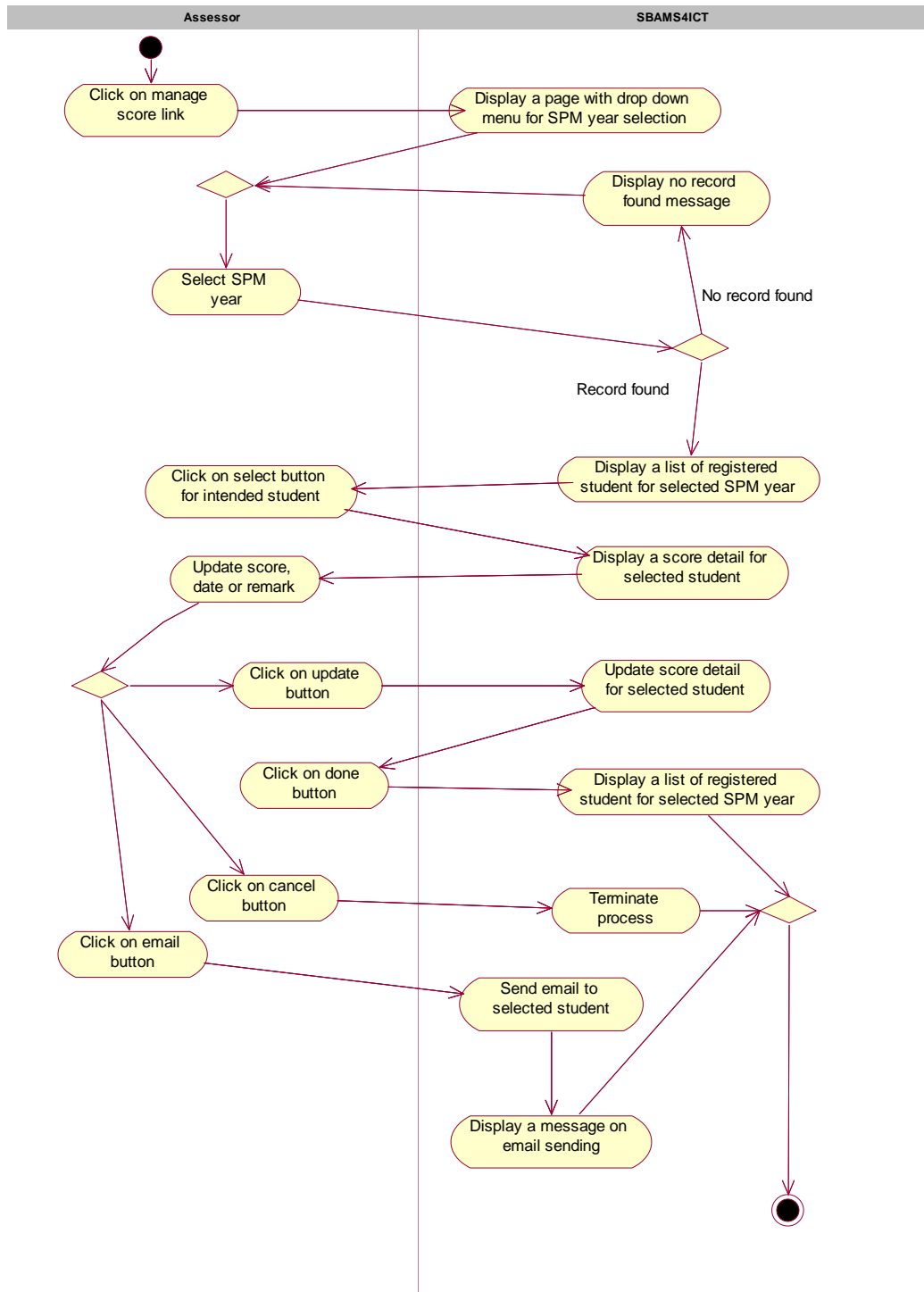
5   ACTIVITY DIAGRAM: PRINT ISF (SBAMS4ICT_05_01)
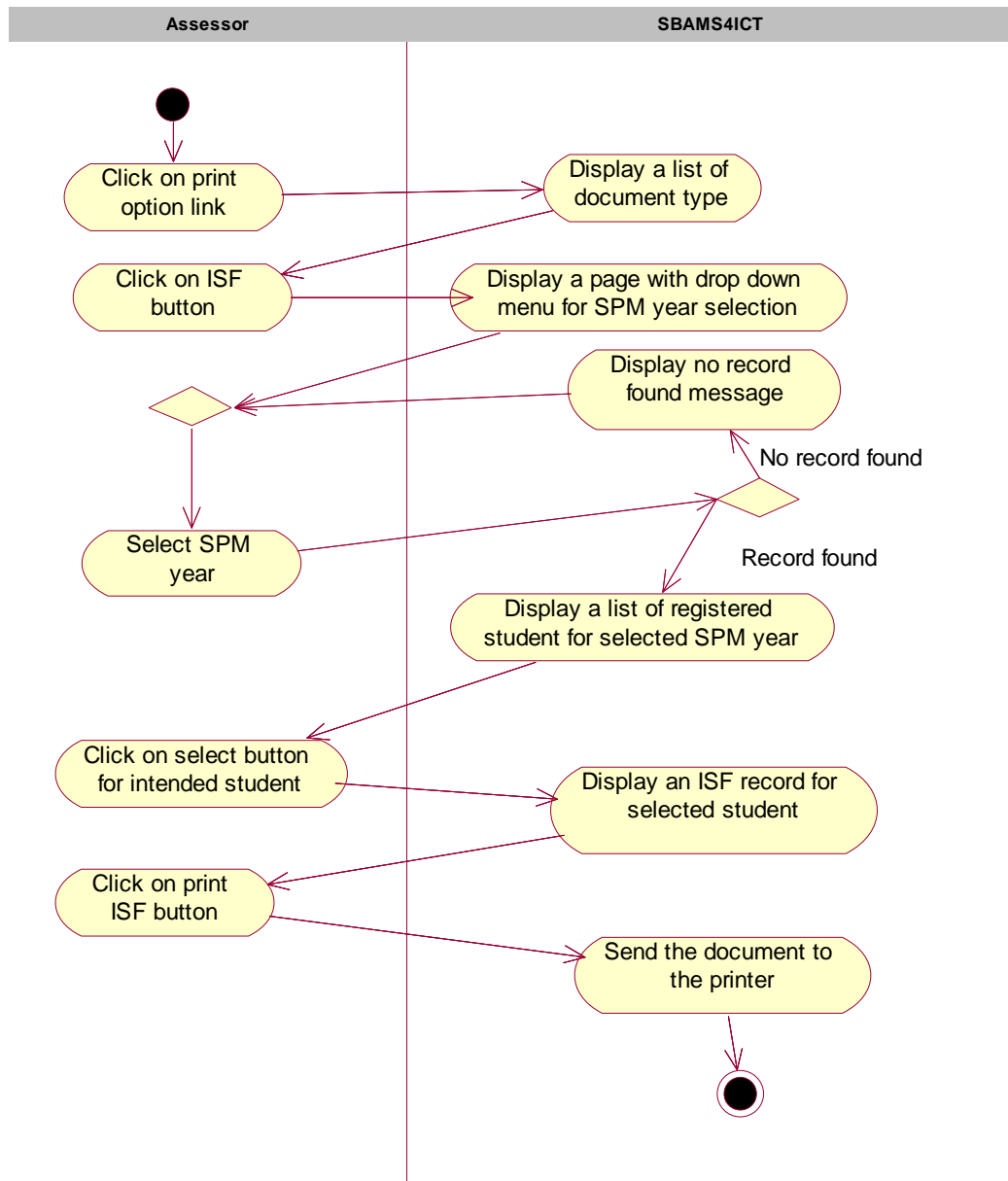
5   ACTIVITY DIAGRAM: PRINT BSF (SBAMS4ICT_05_02)
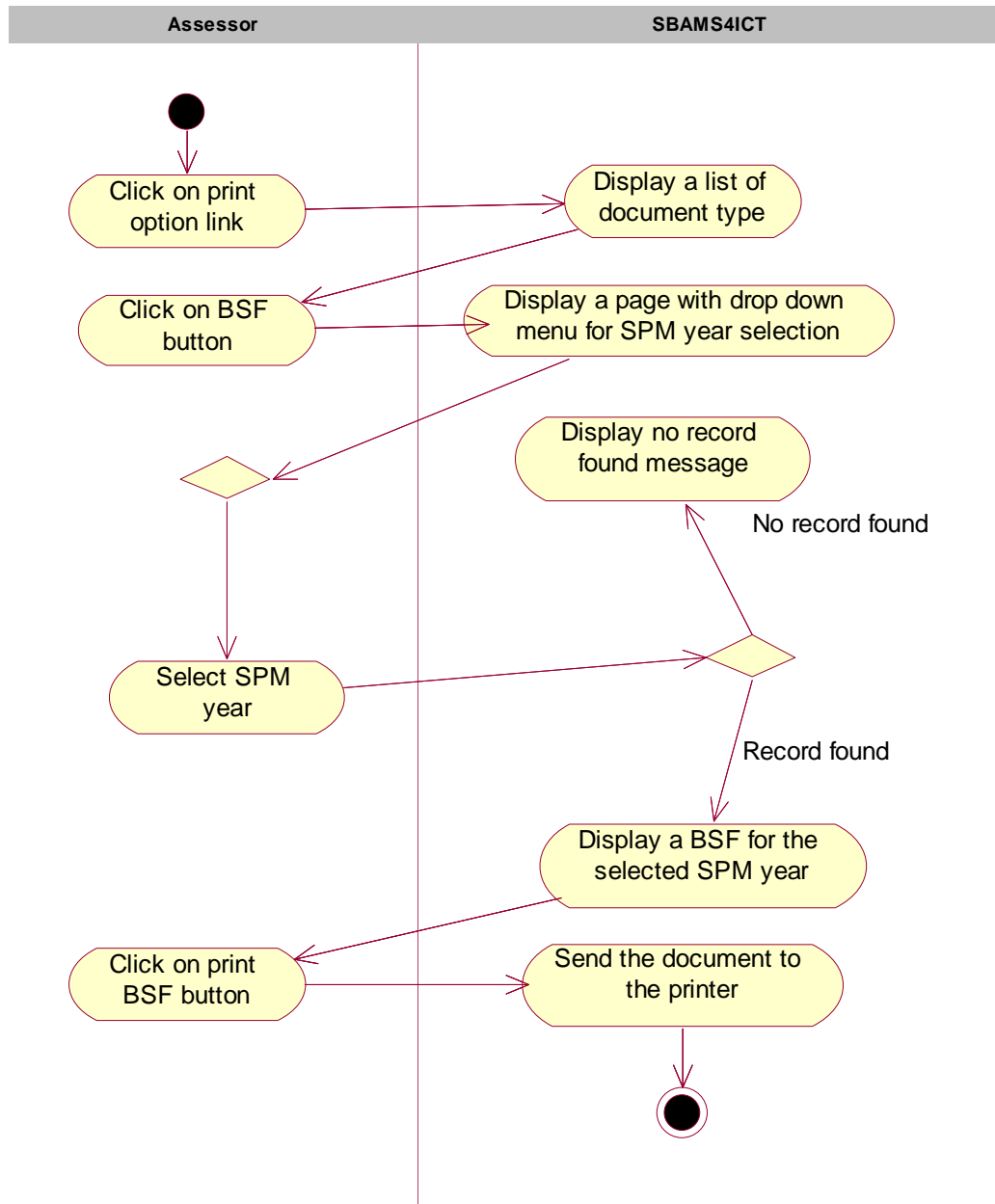
5 ACTIVITY DIAGRAM: PRINT ROS (SBAMS4ICT_05_03)
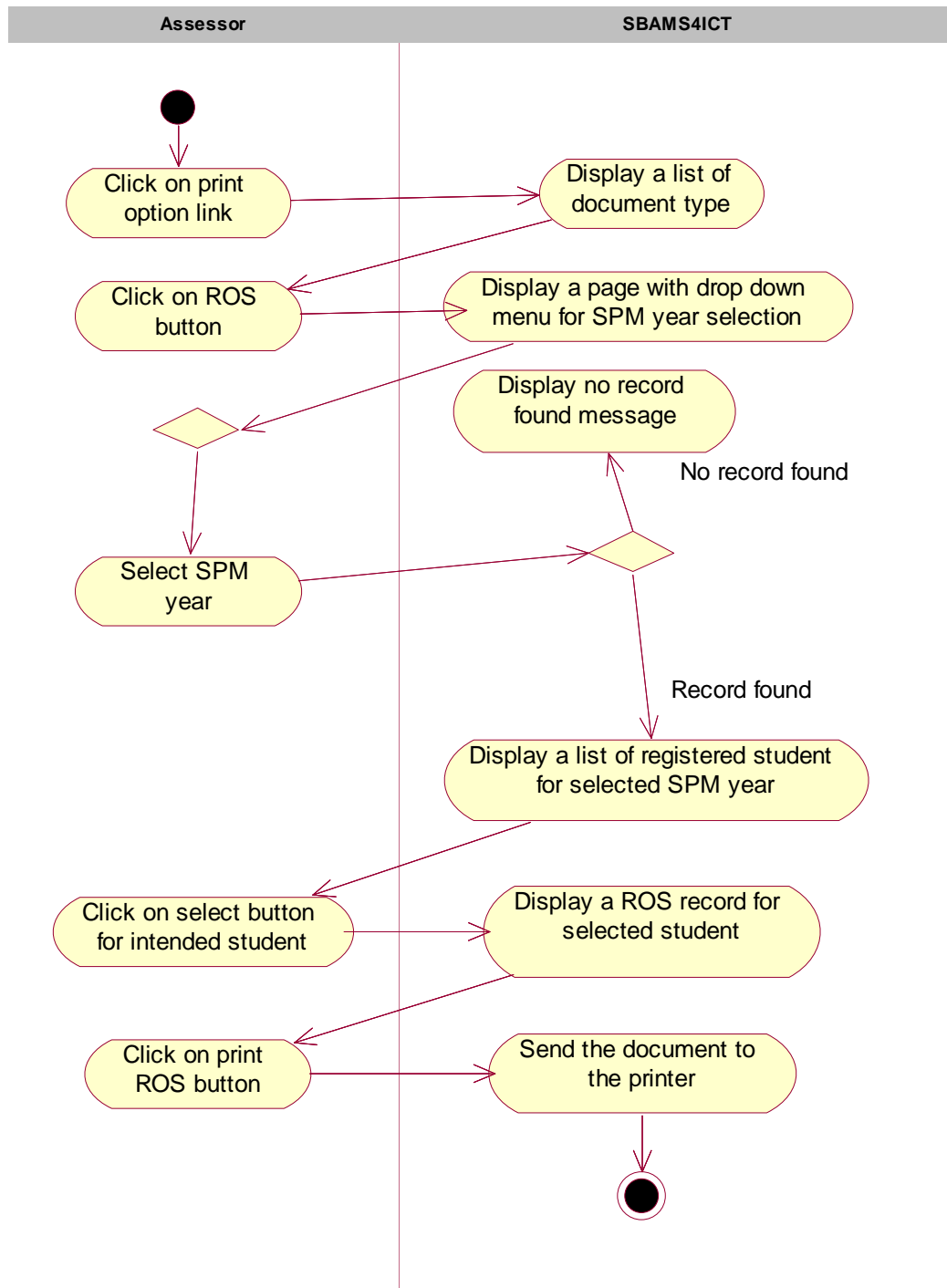
5 ACTIVITY DIAGRAM: PRINT CWP (SBAMS4ICT_05_04)

Assessor	SBAMS4ICT

- Click on print option link
- Display a list of document type
- Click on CWP button
- Display a page with drop down menu for SPM year selection
- Display no record found message

No record found

- Select SPM year

Record found

- Display a list of registered student for selected SPM year
- Click on select button for intended student
- Display a CWP record for selected student
- Click on print CWP button
- Send the document to the printer

6 ACTIVITY DIAGRAM: VIEW PROGRESS (SBAMS4ICT_06_01)
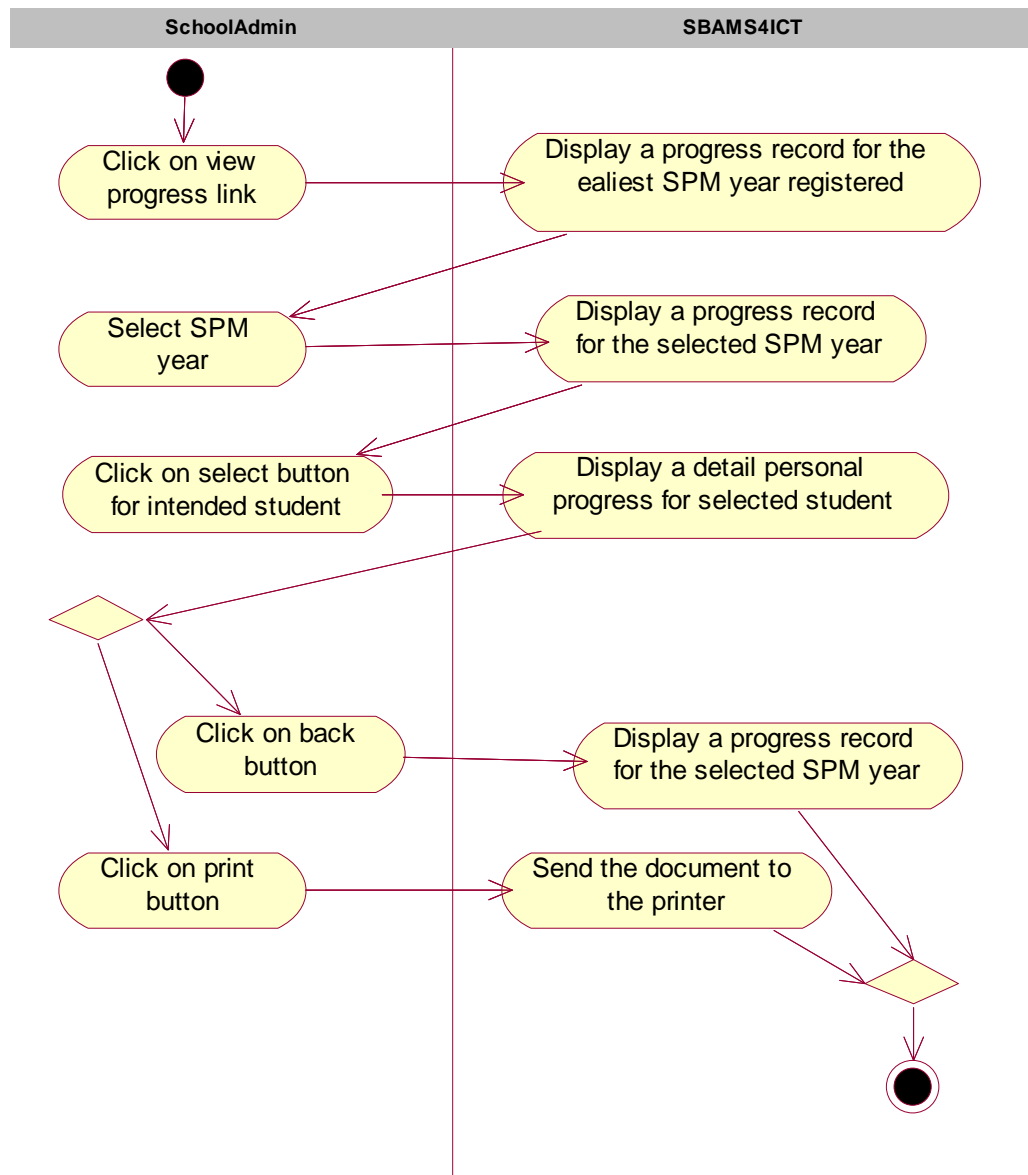
7   ACTIVITY DIAGRAM: SEARCH RECORD (SBAMS4ICT_07_01)
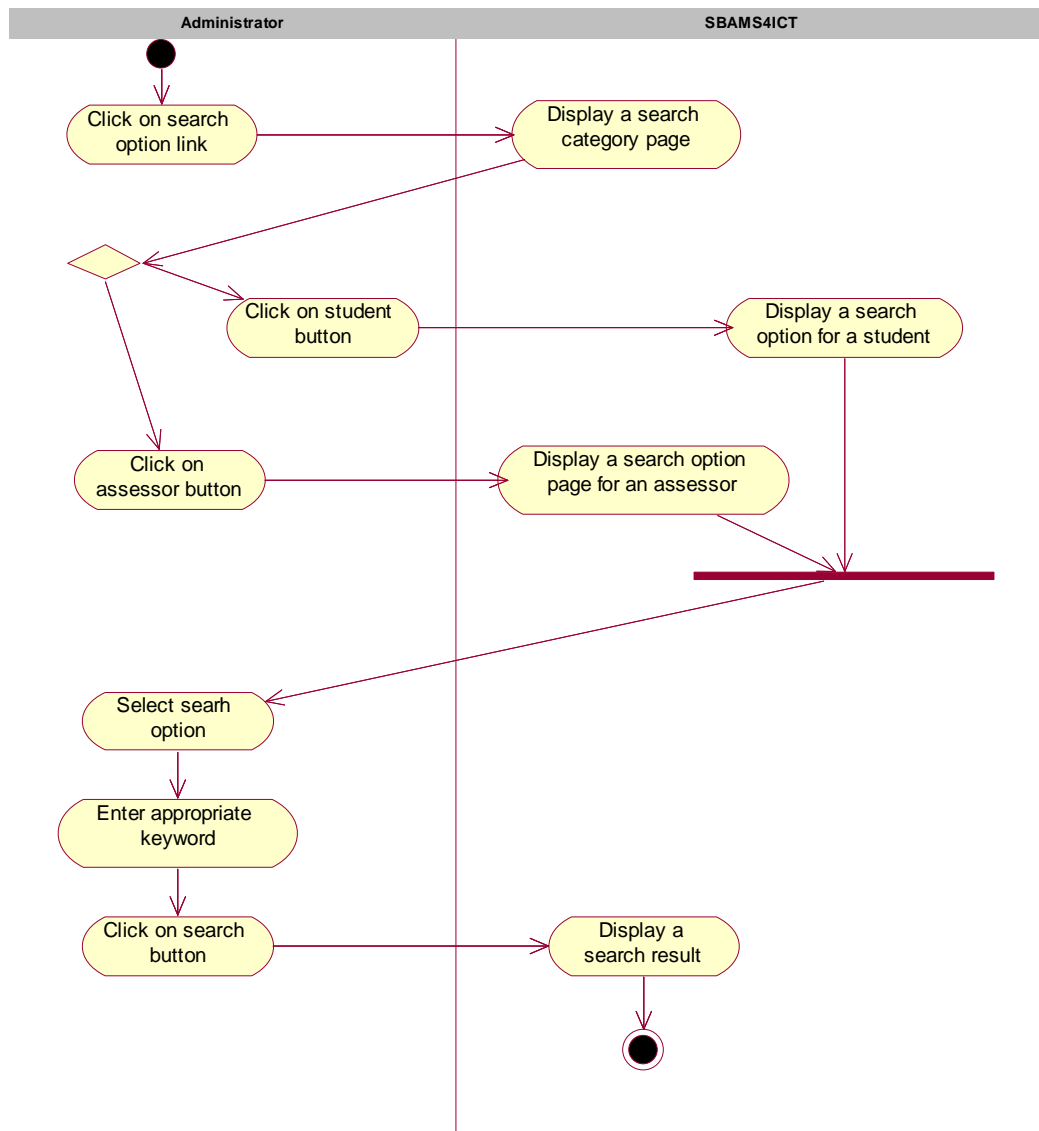
8 ACTIVITY DIAGRAM: REASSIGN STUDENT (SBAMS4ICT_08_01)

9 ACTIVITY DIAGRAM: MANAGE USERS' DETAILS (SBAMS4ICT_09_01)
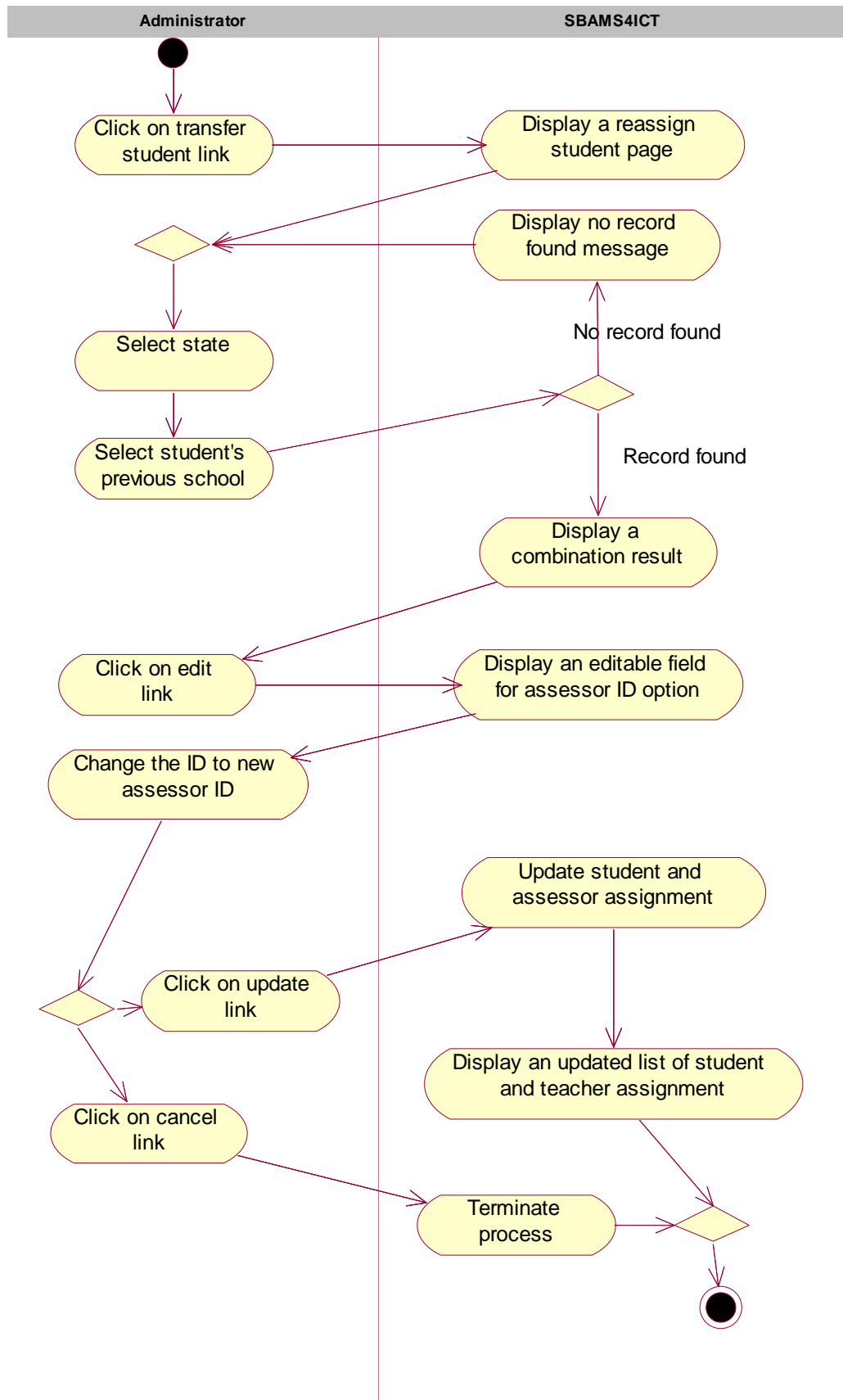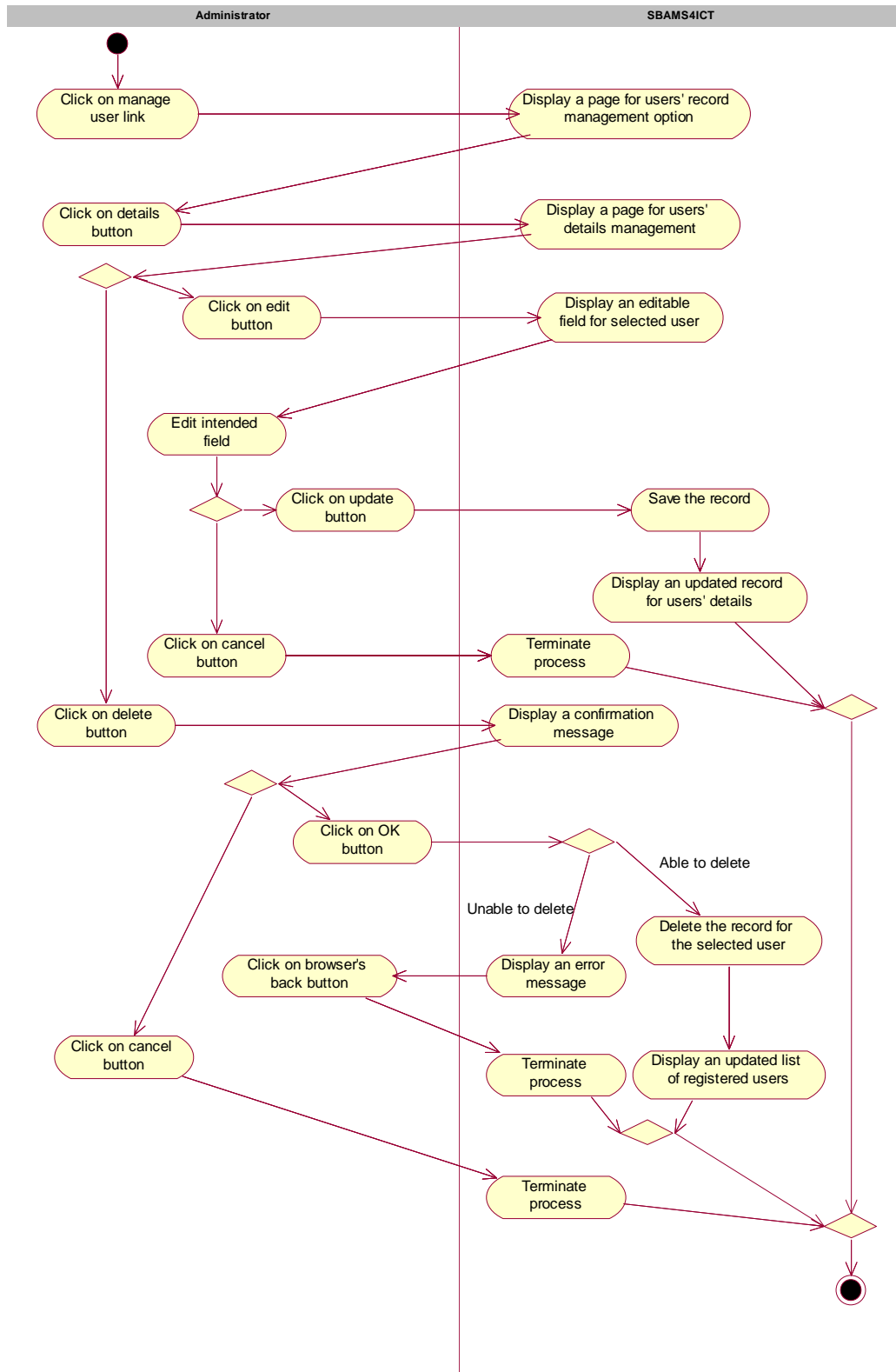
9 ACTIVITY DIAGRAM: MANAGE USERS' STATUS (SBAMS4ICT_09_02)
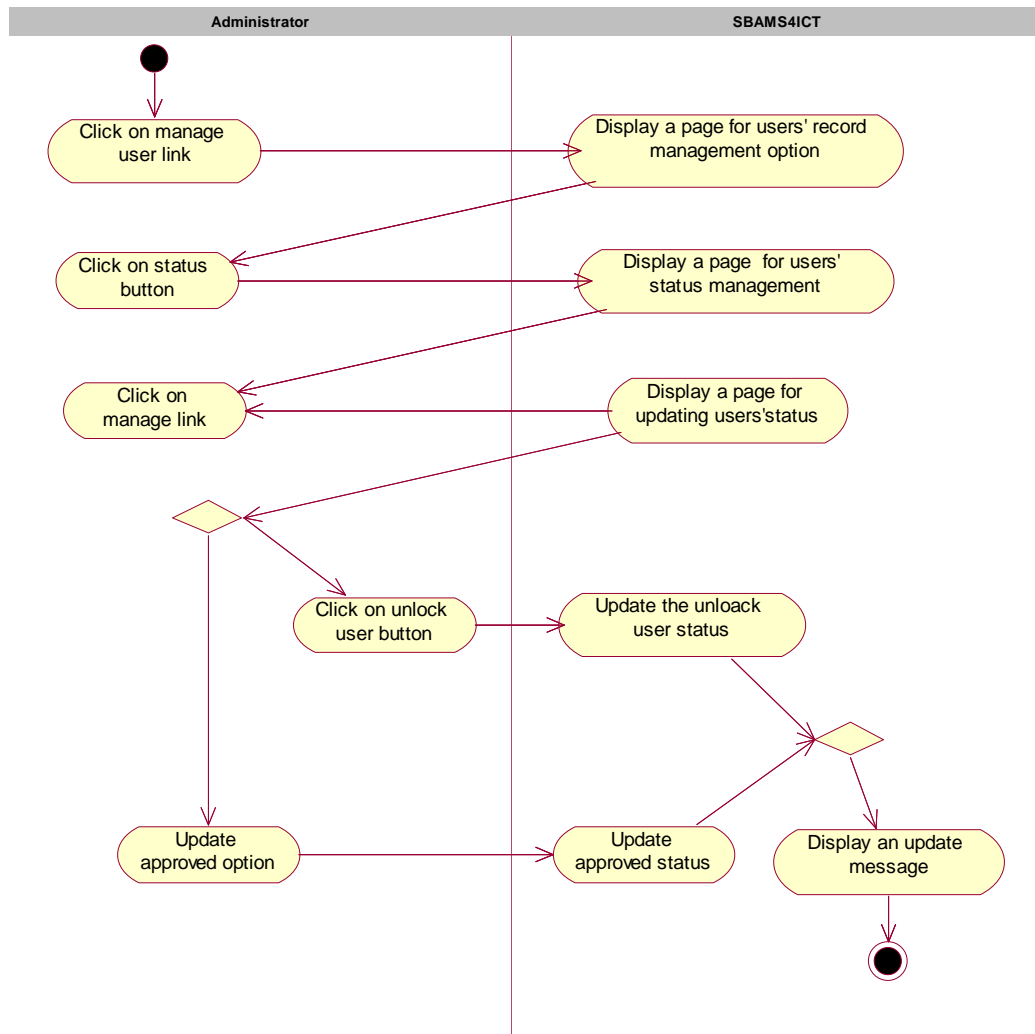
9 ACTIVITY DIAGRAM: MANAGE USERS' ROLES (SBAMS4ICT_09_03)

10 ACTIVITY DIAGRAM: MANAGE ROLE (SBAMS4ICT_10_01)

11   ACTIVITY DIAGRAM: MANAGE SCHOOL (SBAMS4ICT_11_01)

11   ACTIVITY DIAGRAM: ADD SCHOOL (SBAMS4ICT_11_02)

12 ACTIVITY DIAGRAM: MANAGE DISTRICT (SBAMS4ICT_12_01)

12 ACTIVITY DIAGRAM: MANAGE STATE (SBAMS4ICT_12_02)

Administrator	SBAMS4ICT

Click on district | state link

Display a page for district and state management

Click on state button

Display a manage state page

Key in new state record

Click on insert button

Record accepted

Save new state record

Duplicate record

DIsplay an error page

Display an updated list of registered state

Click on browser's back button

Terminate process

Click on cancel button

Terminate process

Click on delete button

Display a confirmation message

Click on OK button

Able to delete

Delete the selected state record

Unable to delete

DIsplay an error page

Display an updated list of registered state

Click on browser's back button

Terminate process

Click on cancel button

Terminate process

13 ACTIVITY DIAGRAM: MANAGE SPM YEAR (SBAMS4ICT_13_01)

14. ACTIVITY DIAGRAM: LOGOUT (SBAMS4ICT_10_01)
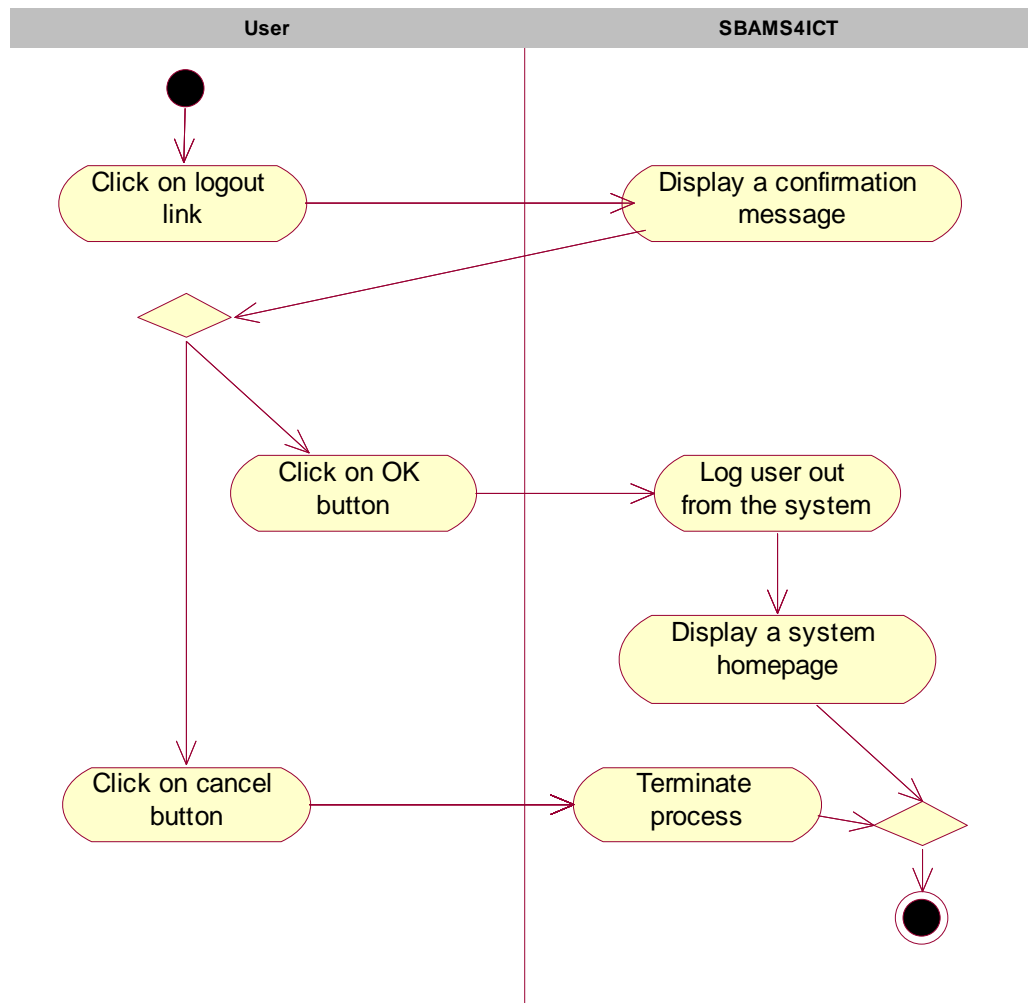
User	SBAMS4ICT

Appendix 6: Sequence Diagram

Registration: Basic Flow   (SBAMS4ICT_01_01)
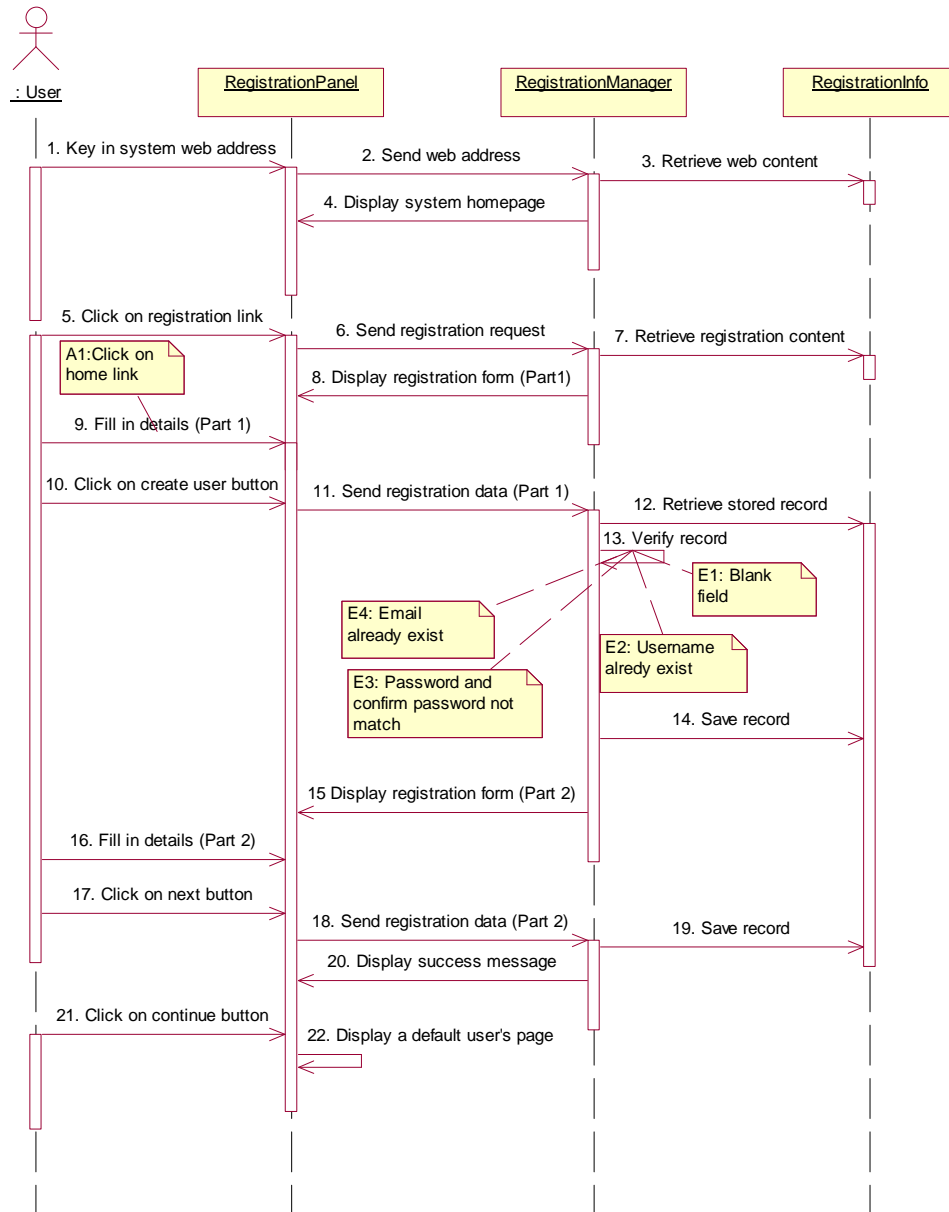
Registration: [A1: Click on Home Link]   (SBAMS4ICT_01_02)

: User | RegistrationPanel | RegistrationManager | RegistrationInfo

1. Key in system web address
2. Send web address
3. Retrieve web content
4. Display system homepage
5. Click on registration link
6. Send registration request
7. Retrieve registration content
8. Display registration form (Part1)
9. Click on home link
10. Return to system homepage
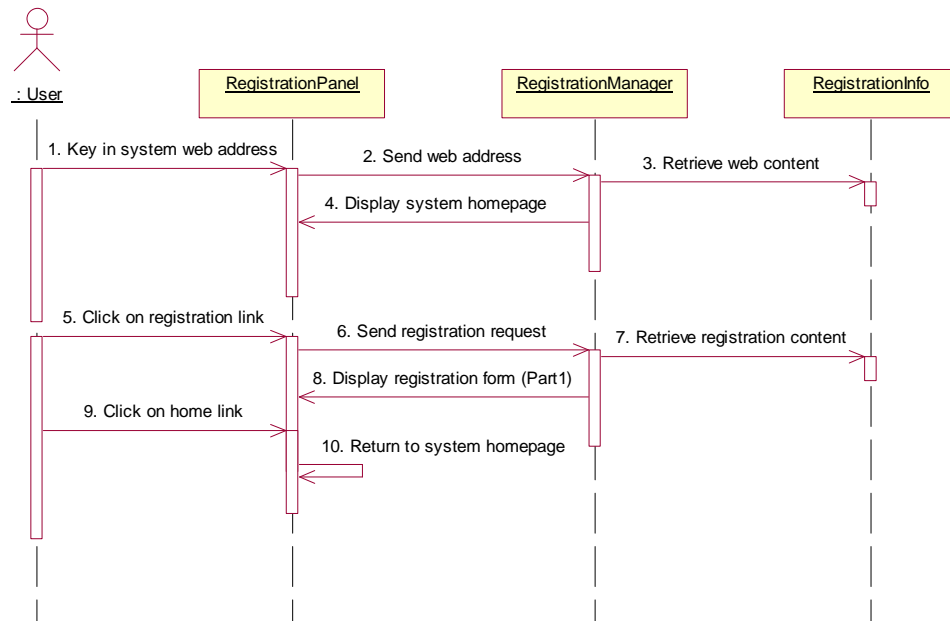
Registration: [E1: Blank Field]   (SBAMS4ICT_01_03)

: User | RegistrationPanel | RegistrationManager | RegistrationInfo

1. Key in system web address
2. Send web address
3. Retrieve web content
4. Display system homepage
5. Click on registration link
6. Send registration request
7. Retrieve registration content
8. Display registration form (Part1)
9. Fill in details (Part 1)
10. Click on create user button
11. Send registration data (Part 1)
12. Retrieve stored record
13. Verify record
14. Display blank field message
15. Fill in the blank field

Registration: [E2: Username already exist]   (SBAMS4ICT_01_04)

Registration: [E3:   Password   and   Confirm   Password   Not   Match]   (SBAMS4ICT_01_05)
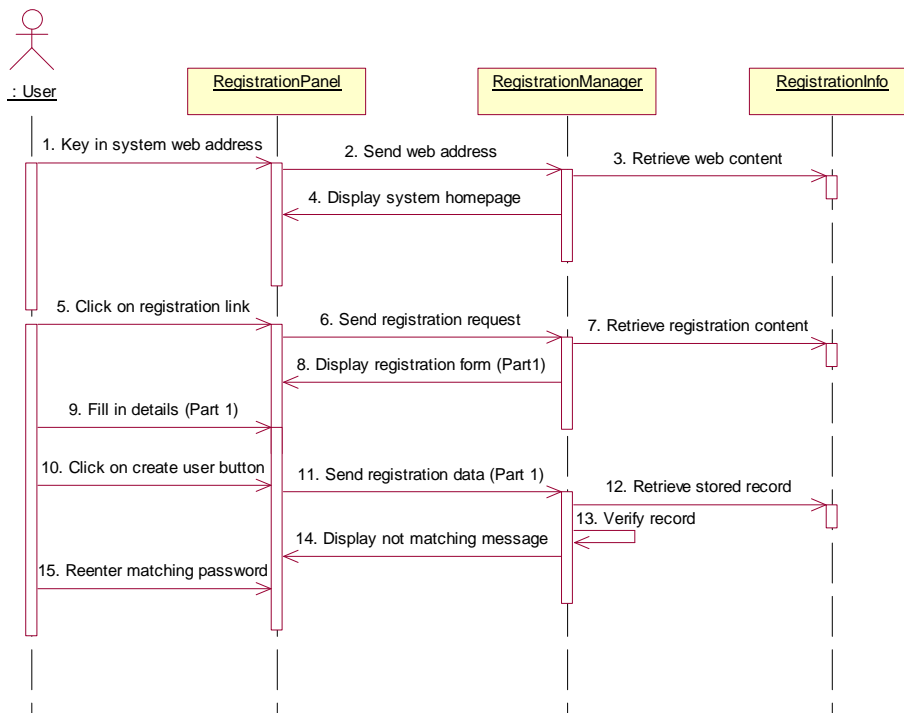
Registration: [E3: Email already exist]   (SBAMS4ICT_01_06)
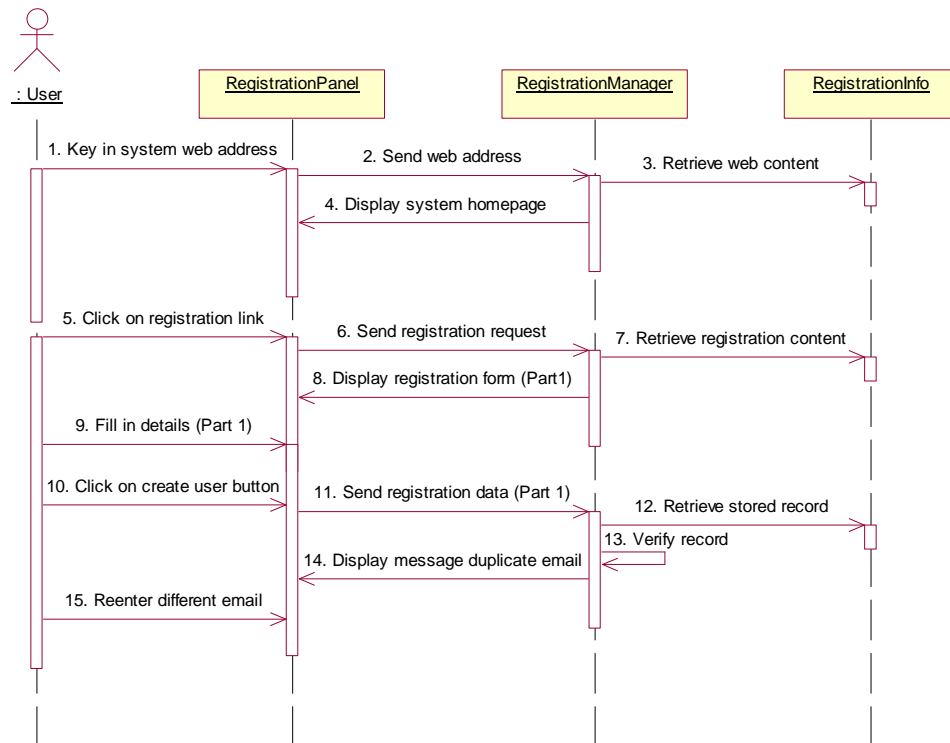
Login: Basic Flow   (SBAMS4ICT_02_01)
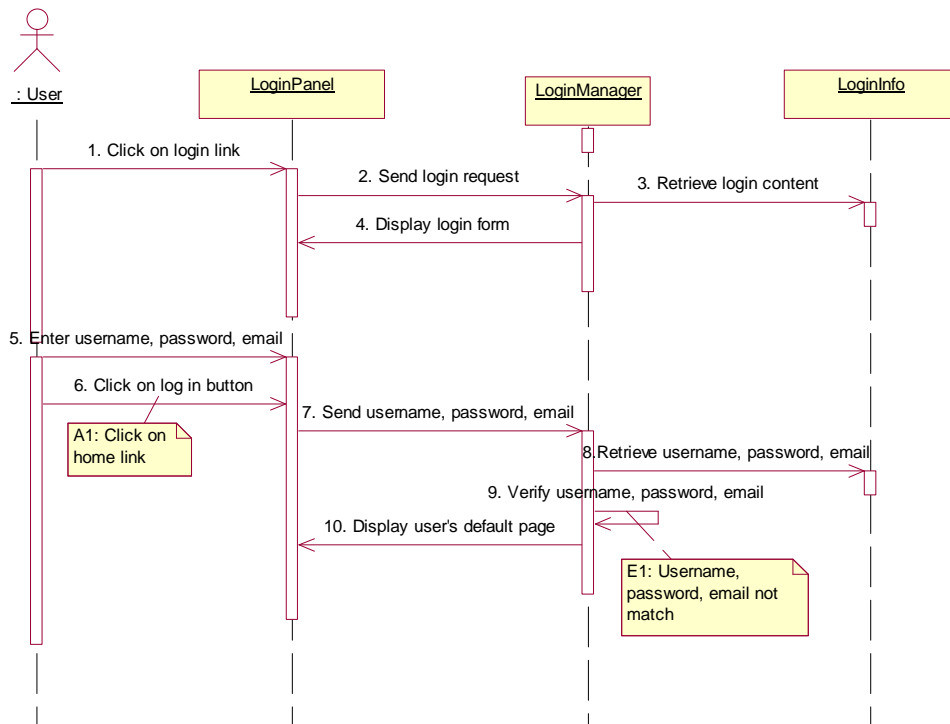
Login: [A1: Click on Home Link]   (SBAMS4ICT_02_02)
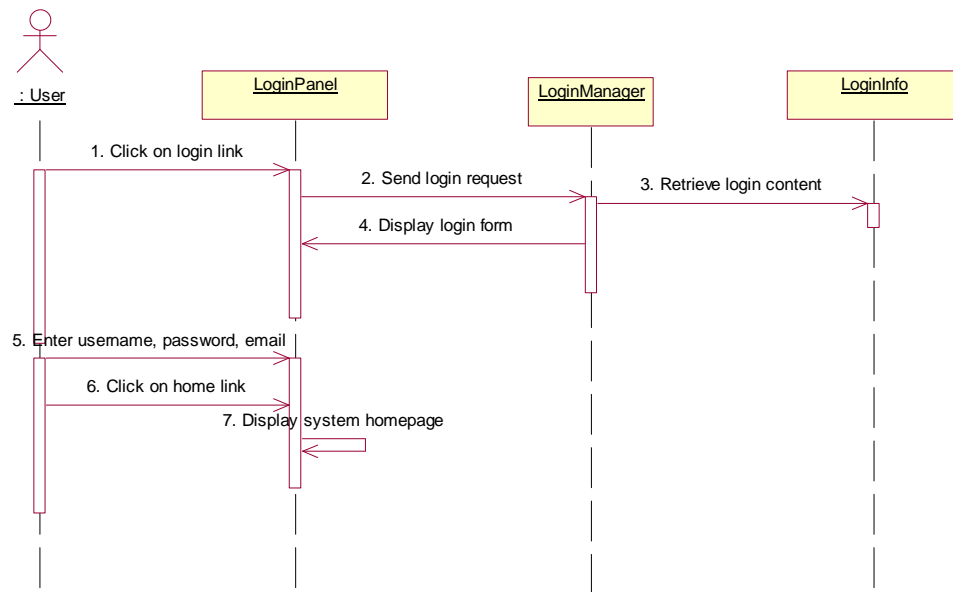
Login: [E1: Username, Password or Email Not Match]   (SBAMS4ICT_02_02)
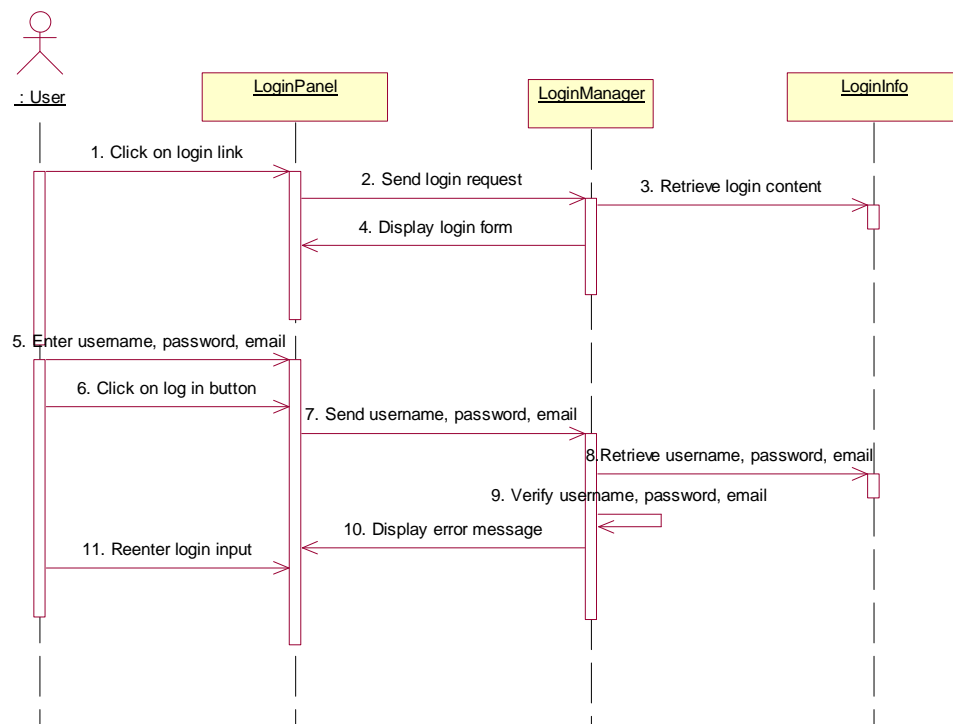
Manage Student: Basic Flow   (SBAMS4ICT_03_01)
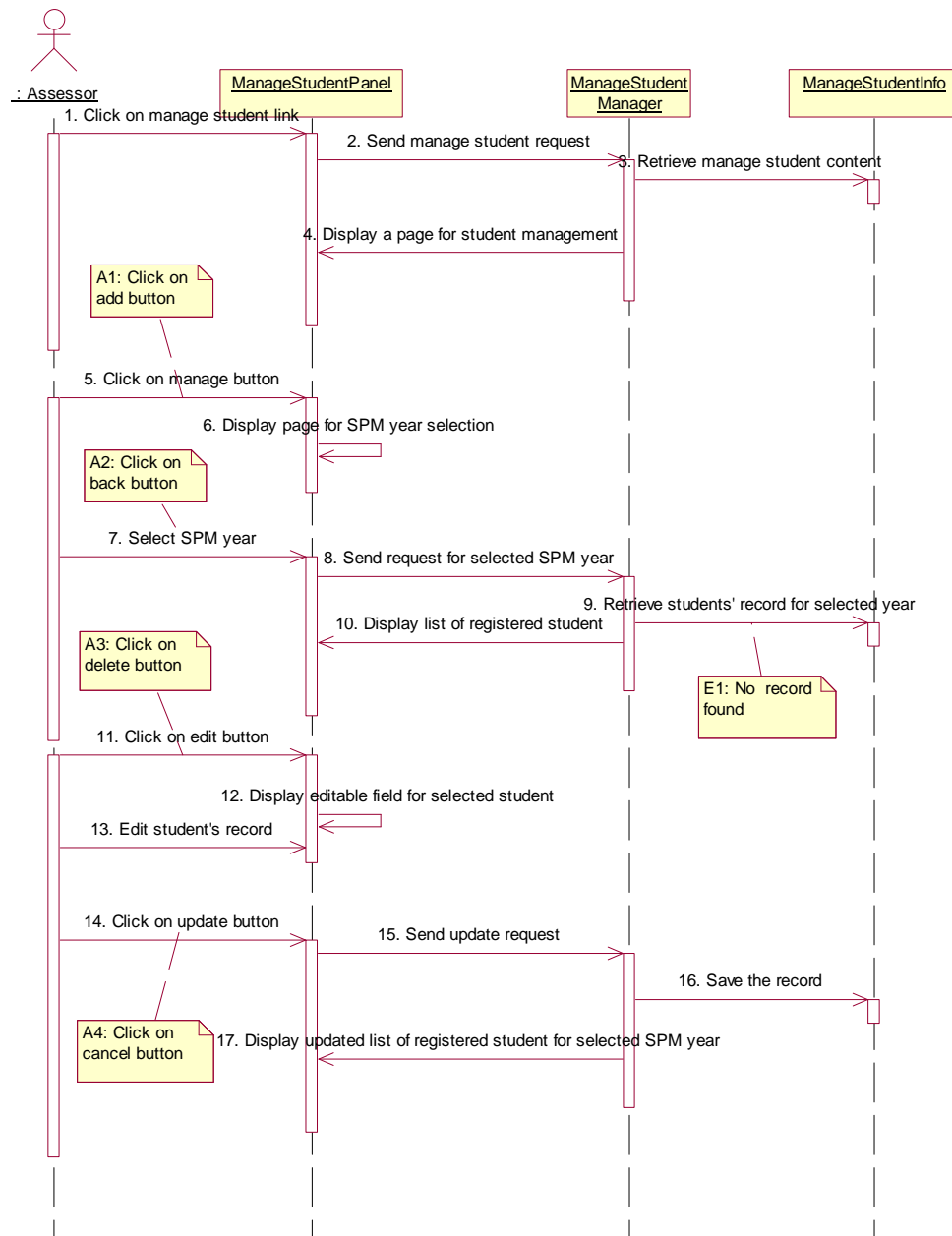
Manage Student: [A1: Click on Add Button] (SBAMS4ICT_03_02)
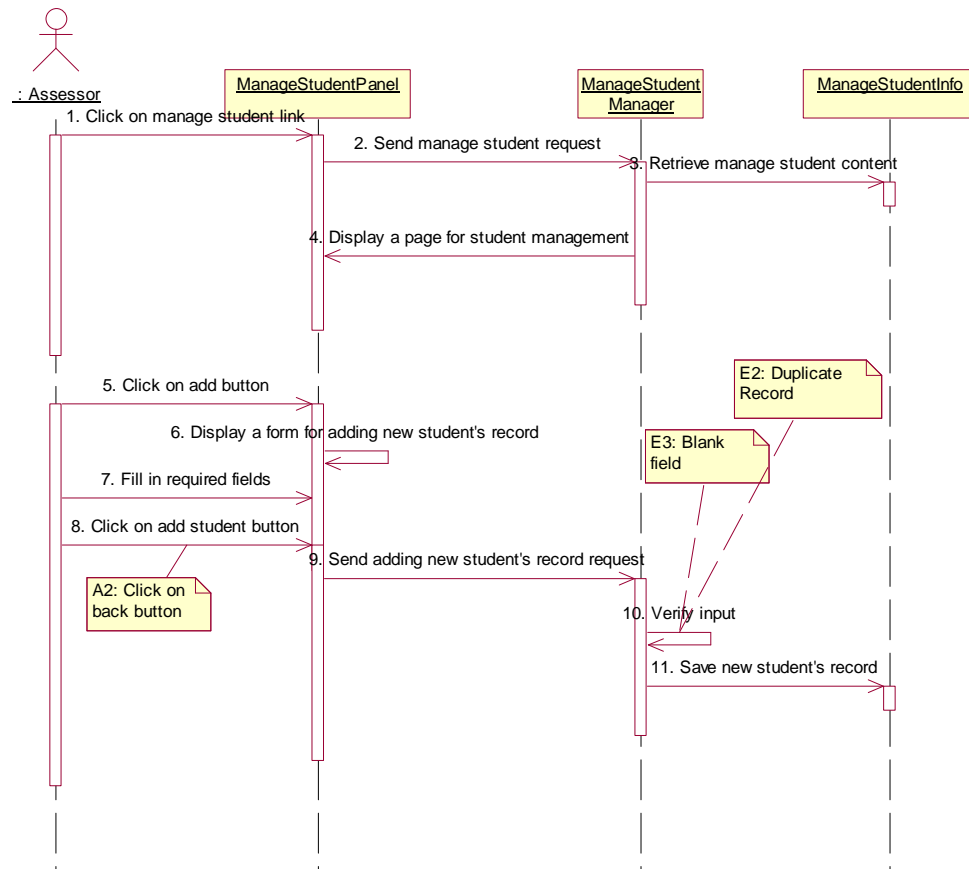
Manage Student: [A2: Click on Back Button] (SBAMS4ICT_03_03)
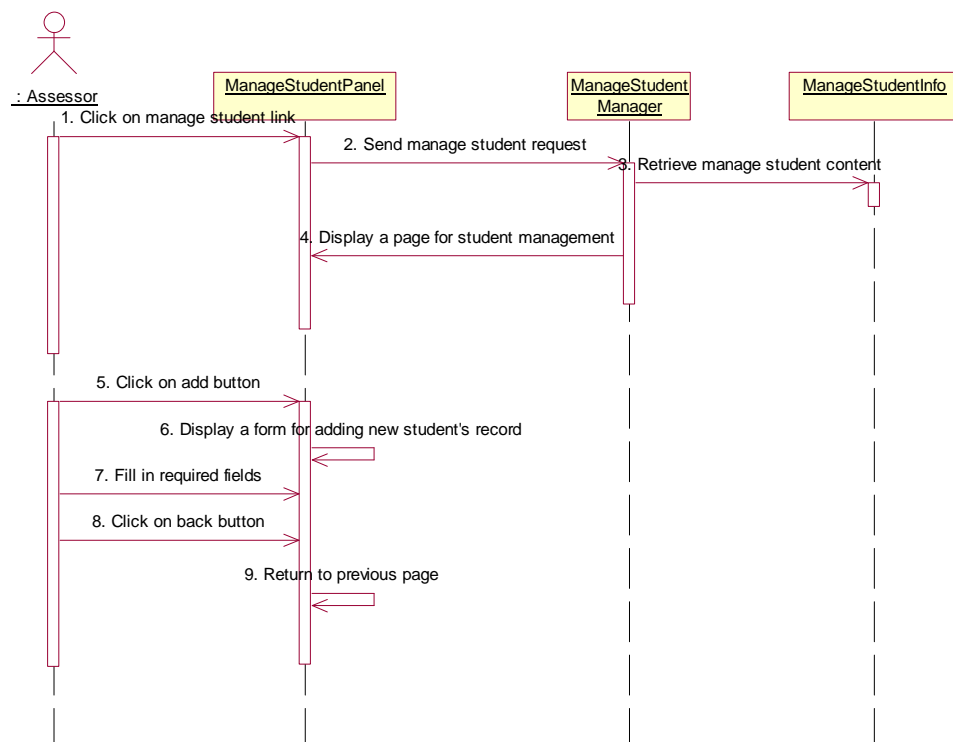
Manage Student: [A3: Click on Delete Button]   (SBAMS4ICT_03_04)
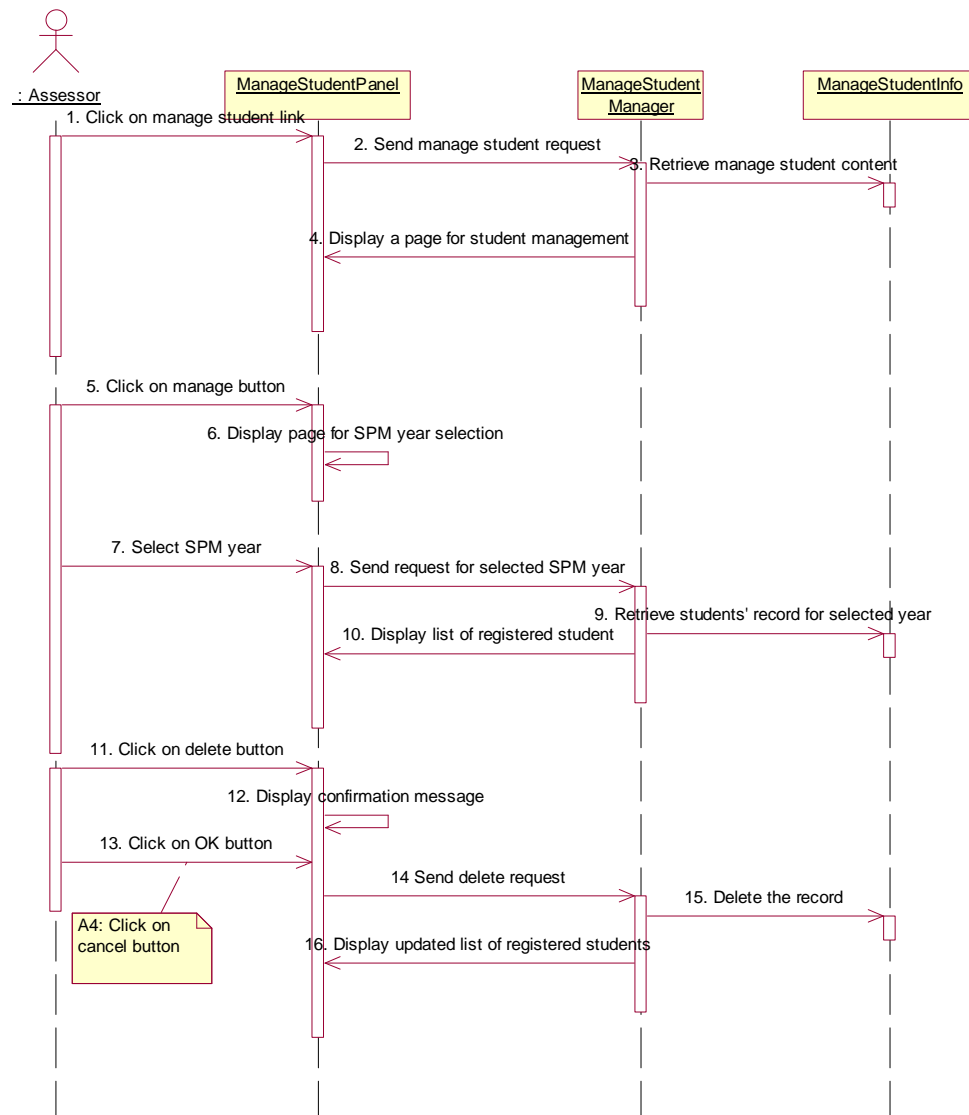
Manage Student: [A4: Click on Cancel Button]   **(SBAMS4ICT_03_05)**
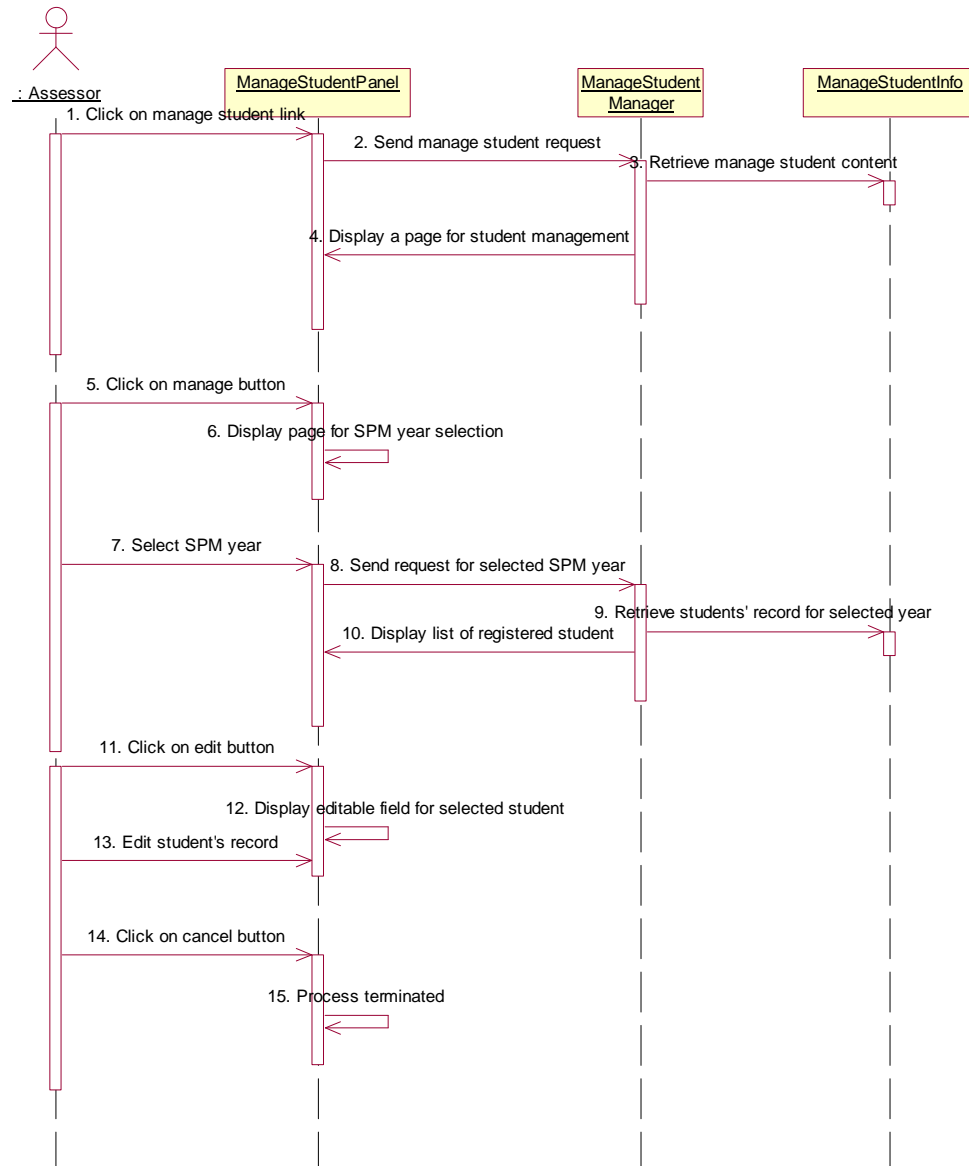
Manage Student: [E1: No Record Found]   (SBAMS4ICT_03_06)
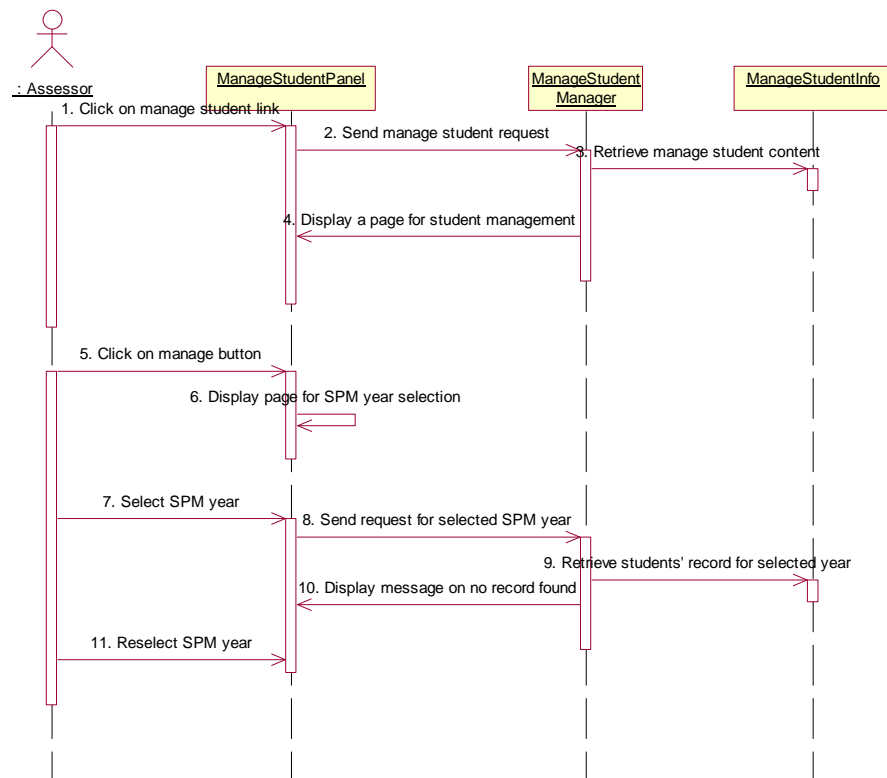
Manage Student: [E2: Duplicate Record]   (SBAMS4ICT_03_07)
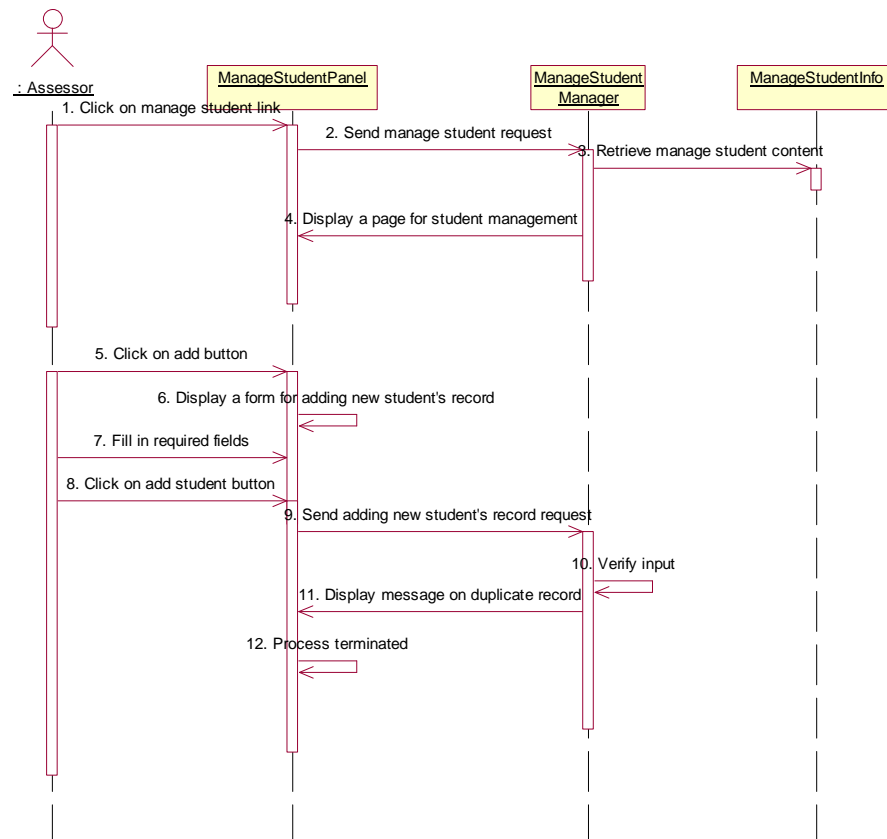
Manage Student: [E3: Blank Field]   (SBAMS4ICT_03_08)
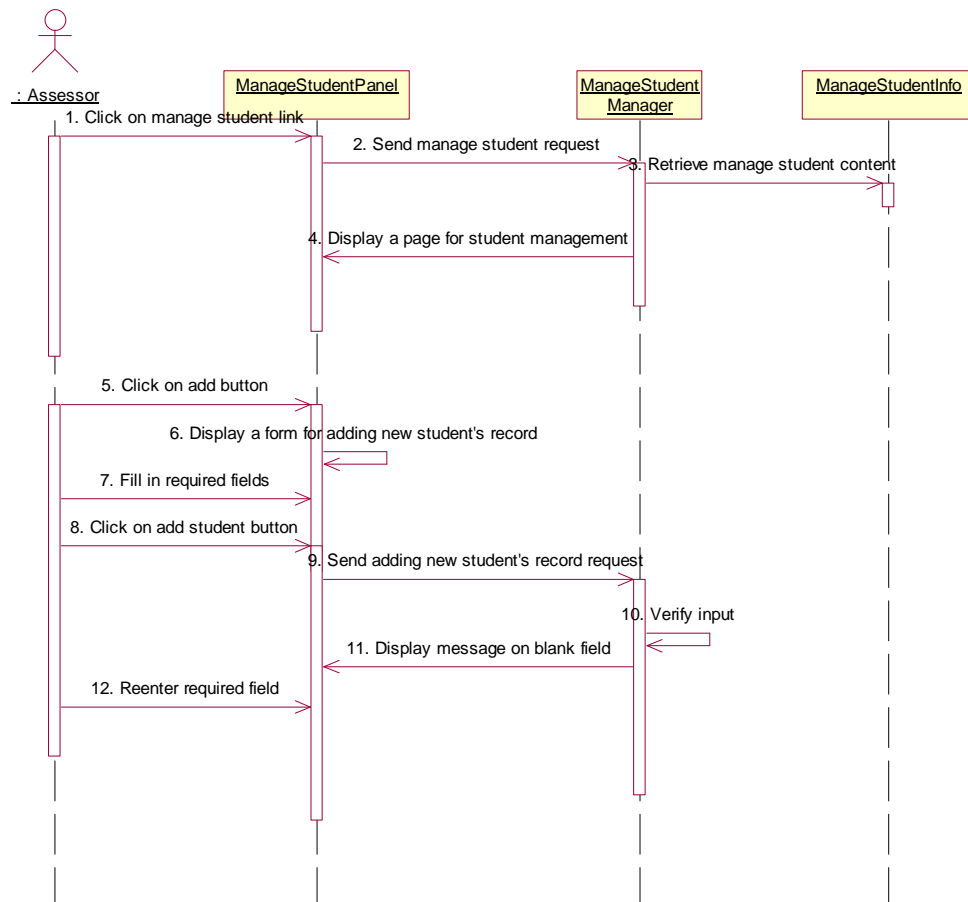
Manage Score: Basic Flow   (SBAMS4ICT_04_01)
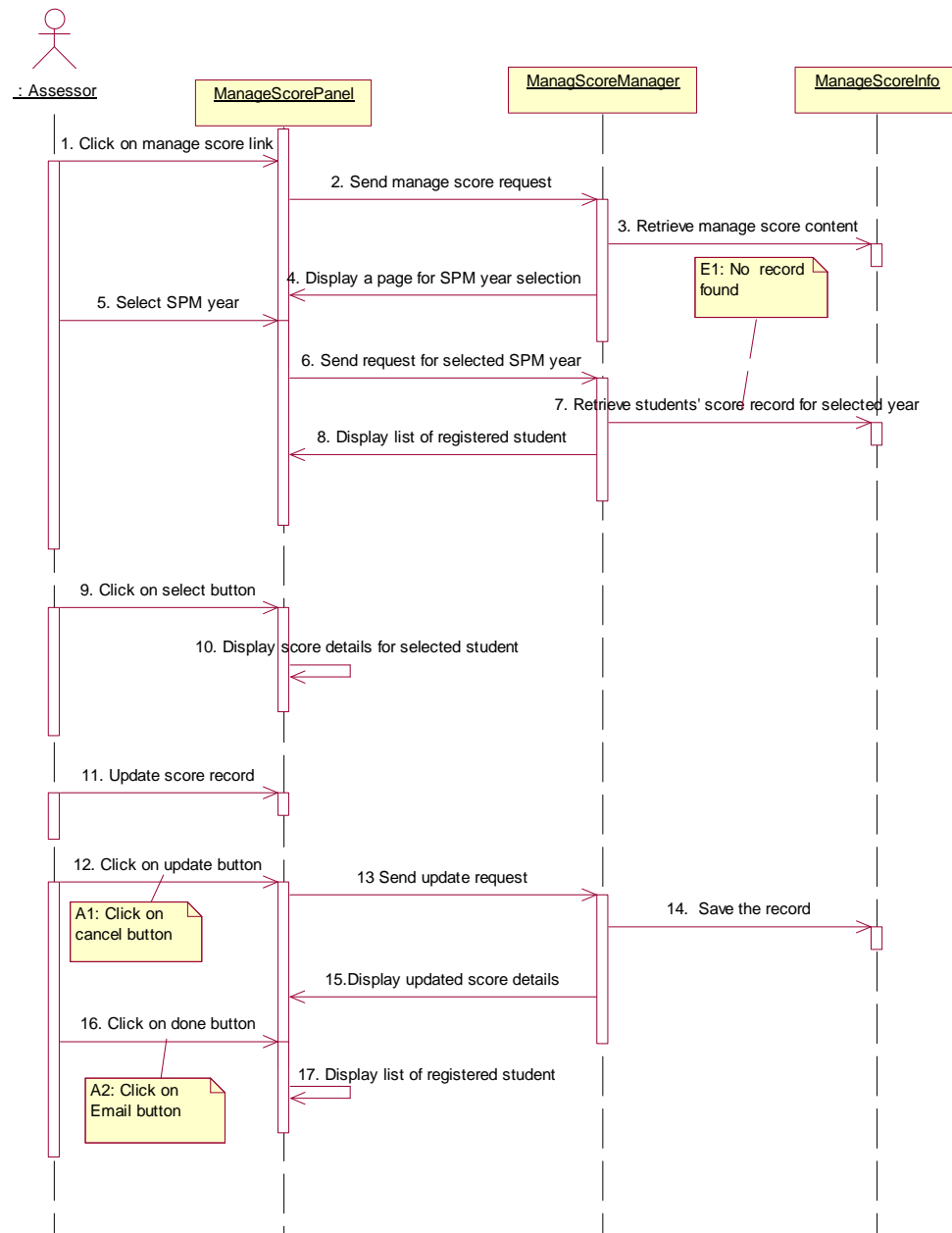
Manage Score: [A1: Click on Cancel Button] (SBAMS4ICT_04_02)
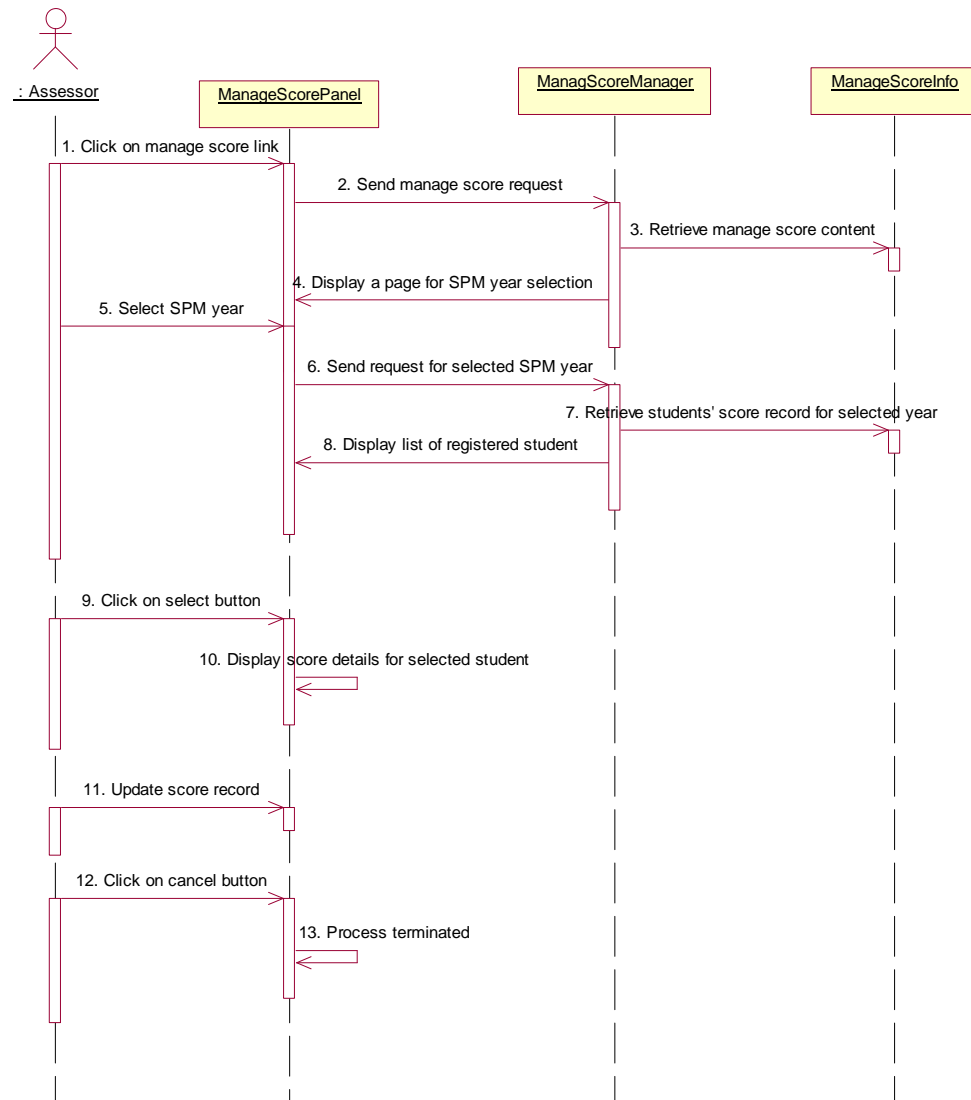
Manage Score: [A2: Click on Email Button]   (SBAMS4ICT_04_03)
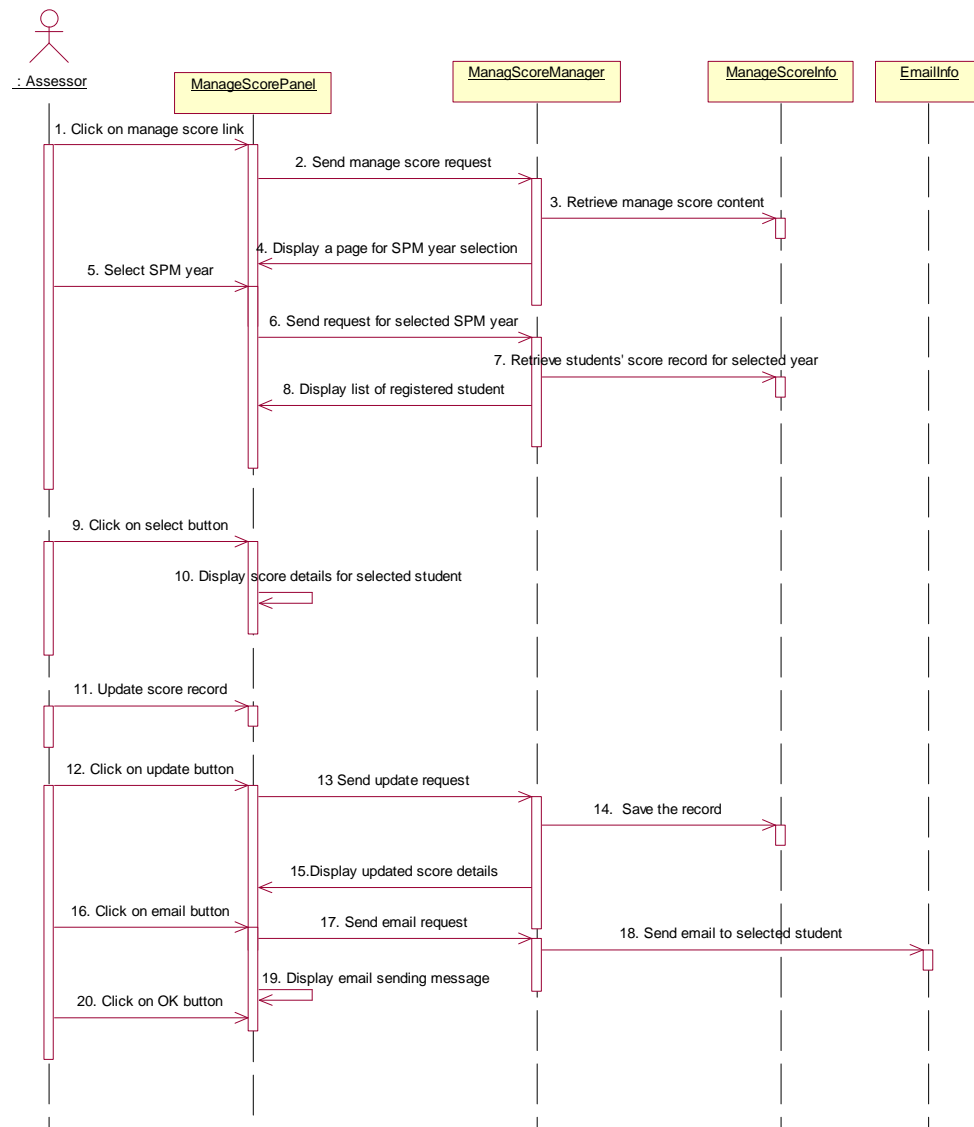
Manage Score: [E1: No Record Found]   (SBAMS4ICT_04_04)
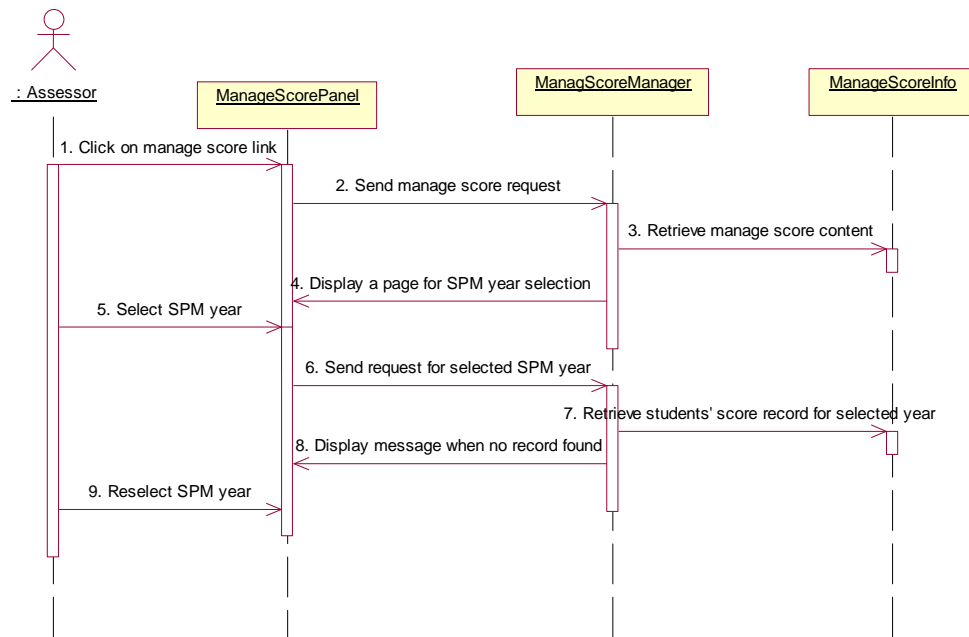
Print Document: Basic Flow   (SBAMS4ICT_05_01)
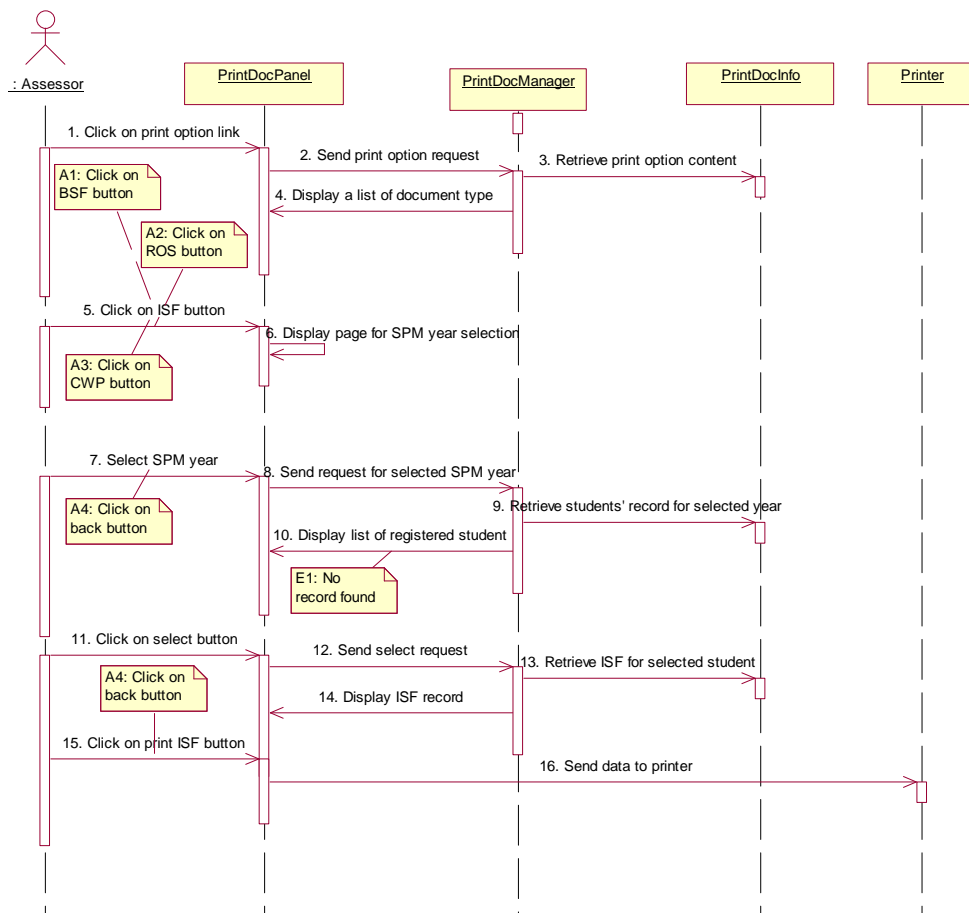
Print Document: [A1: Click on BSF Button]   (SBAMS4ICT_05_02)
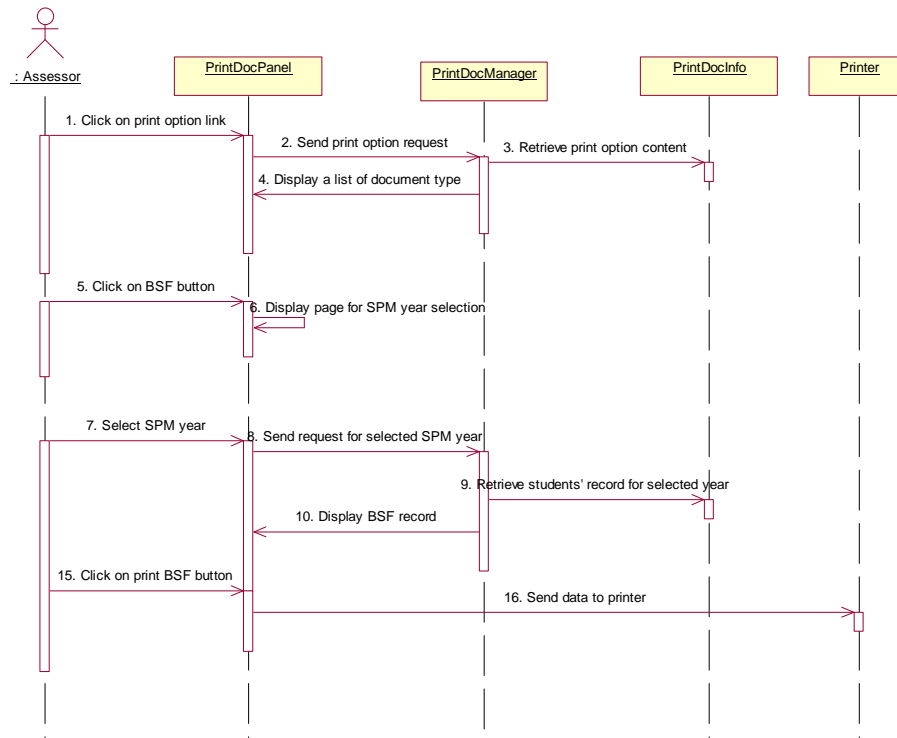
Print Document: [A2: Click on ROS Button]   (SBAMS4ICT_05_03)
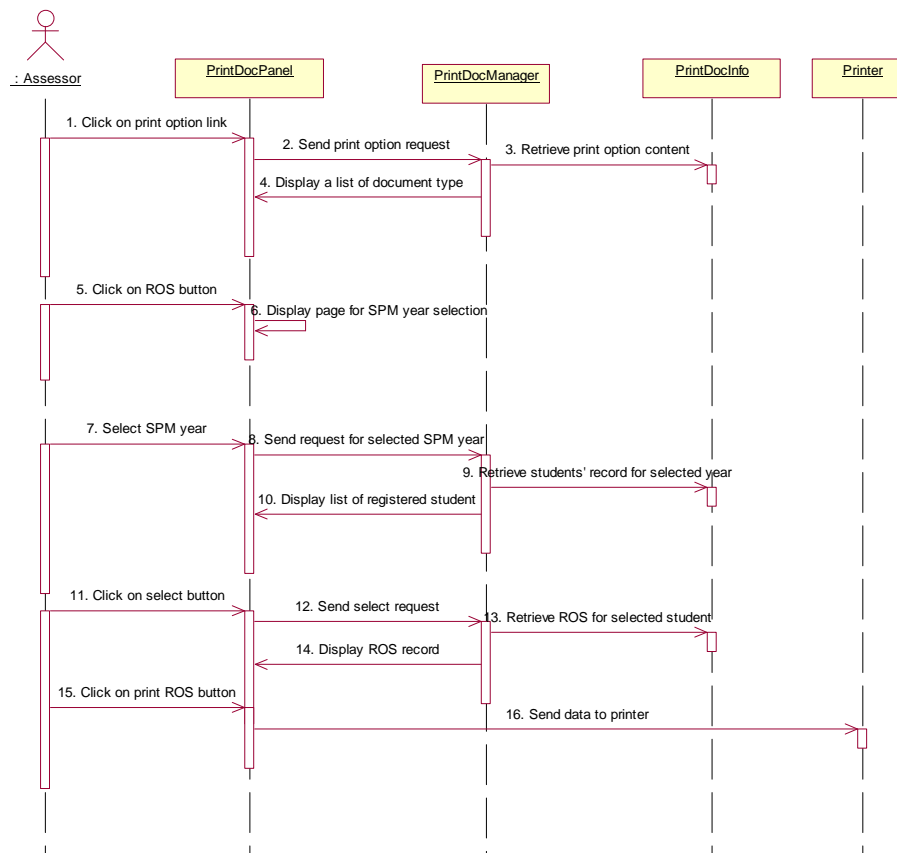
Print Document: [A3: Click on CWP Button] (SBAMS4ICT_05_04)
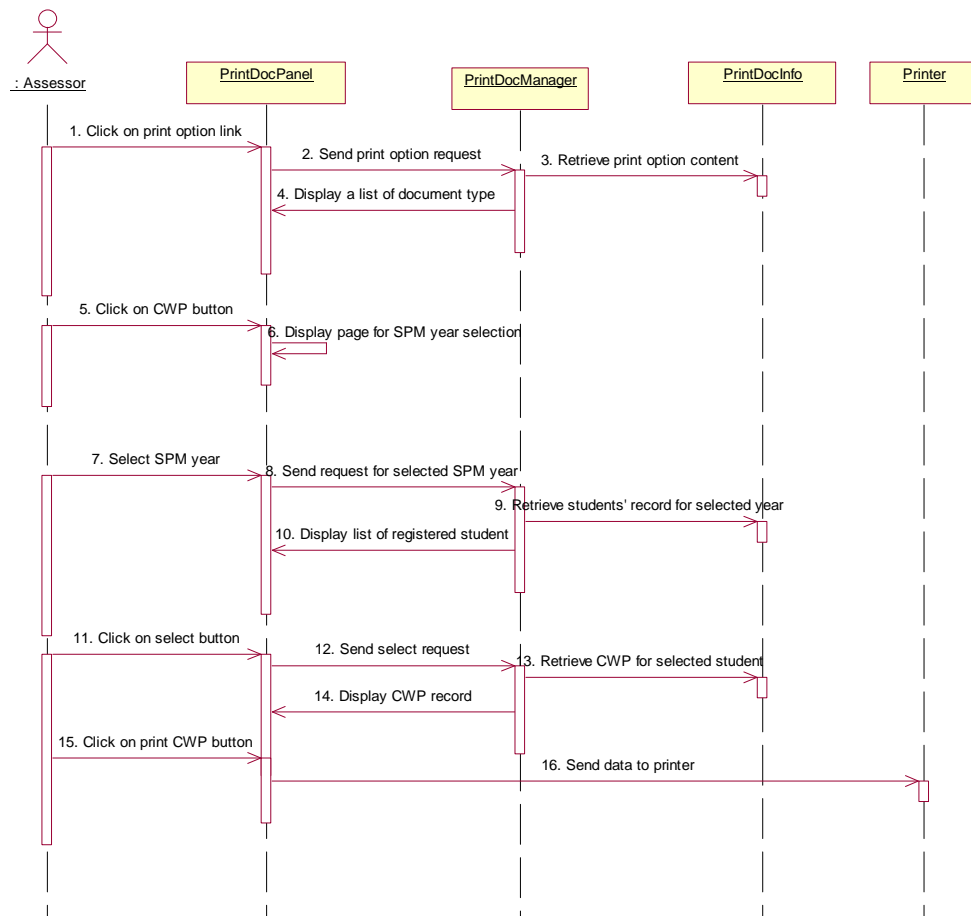
Print Document: [A4: Click on Back Button] (SBAMS4ICT_05_05)
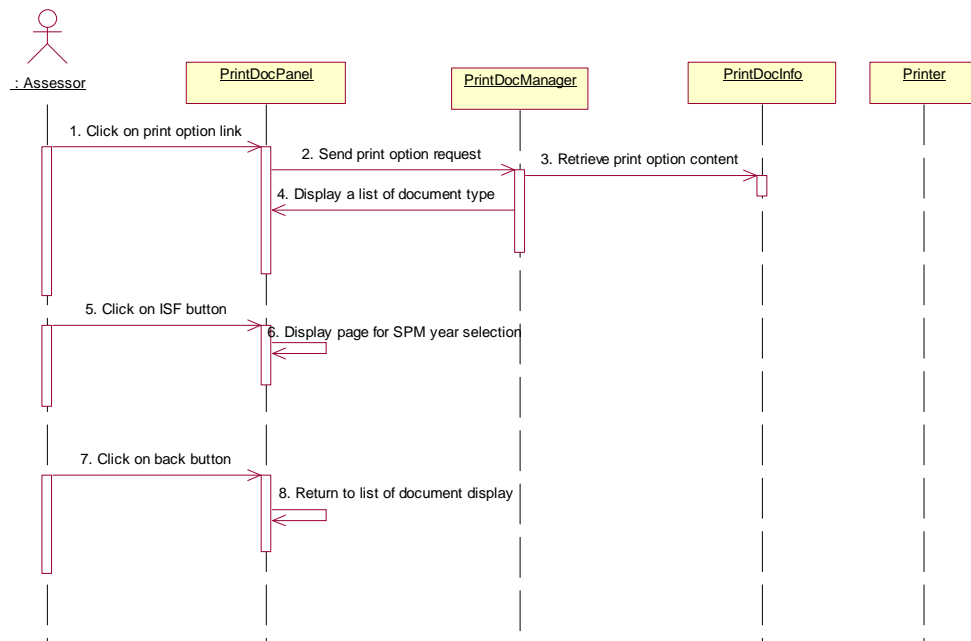
Print Document: [E1: No Record Found]   (SBAMS4ICT_05_06)
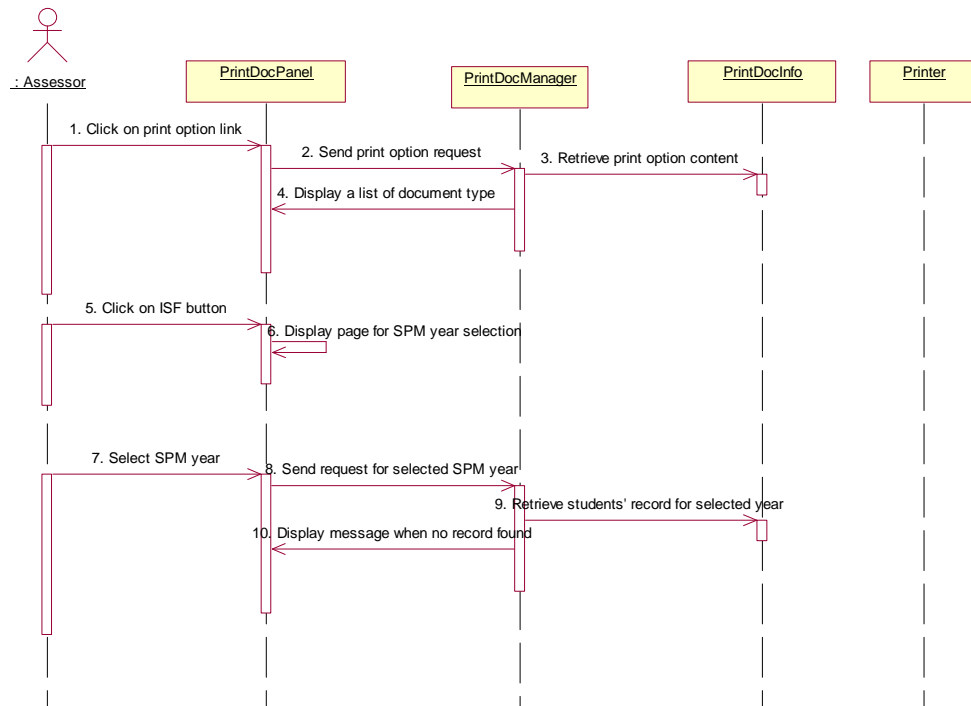
View Progress: Basic Flow   (SBAMS4ICT_06_01)
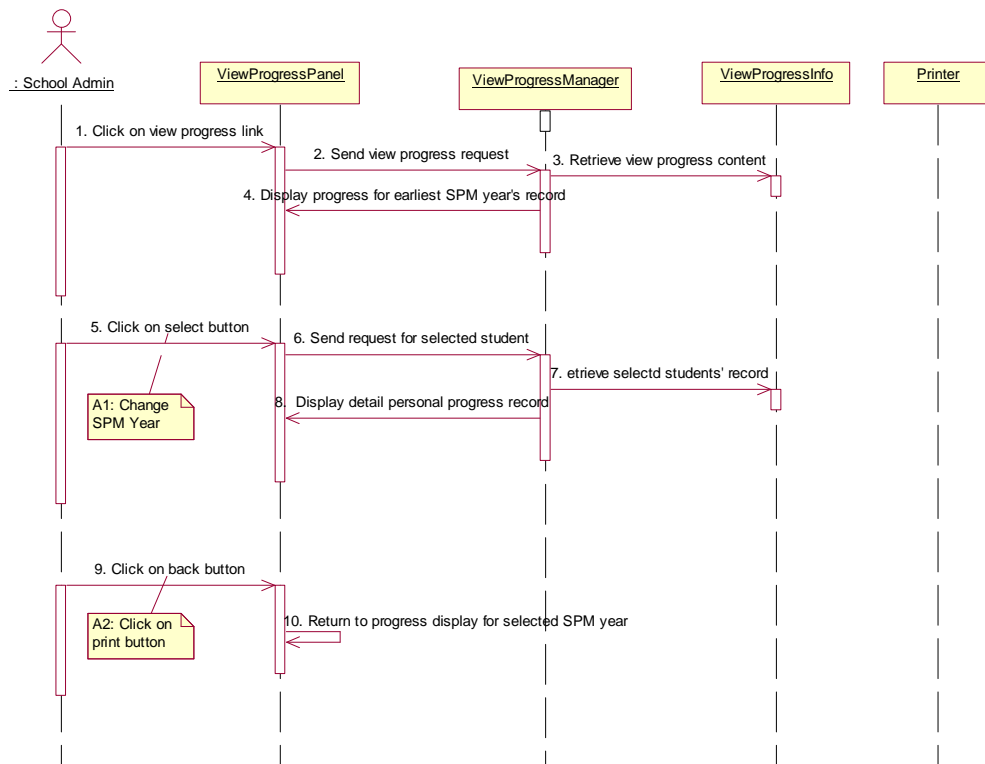
View Progress: [A1: Change SPM Year Option]   (SBAMS4ICT_06_02)
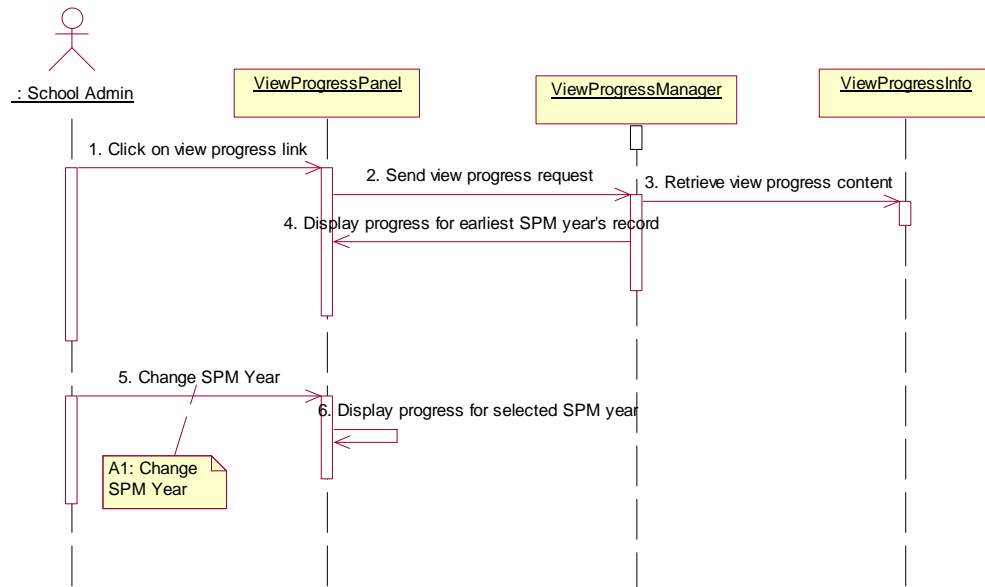
View Progress: [A2: Click on Print Button]   (SBAMS4ICT_06_03)
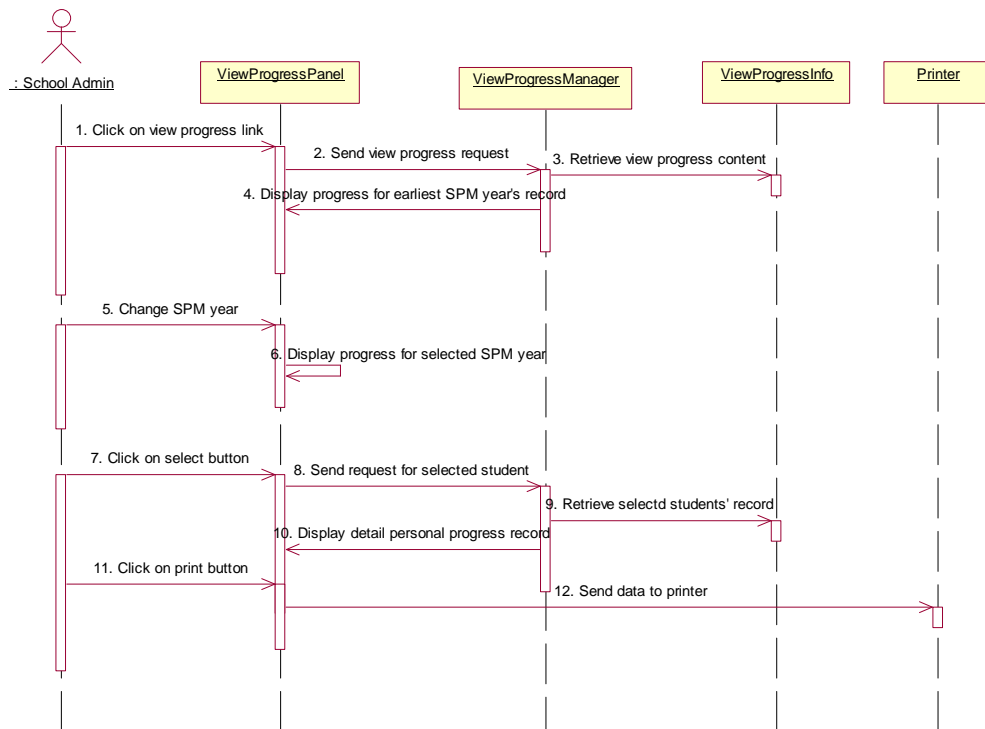
Search Record: Basic Flow   (SBAMS4ICT_07_01)
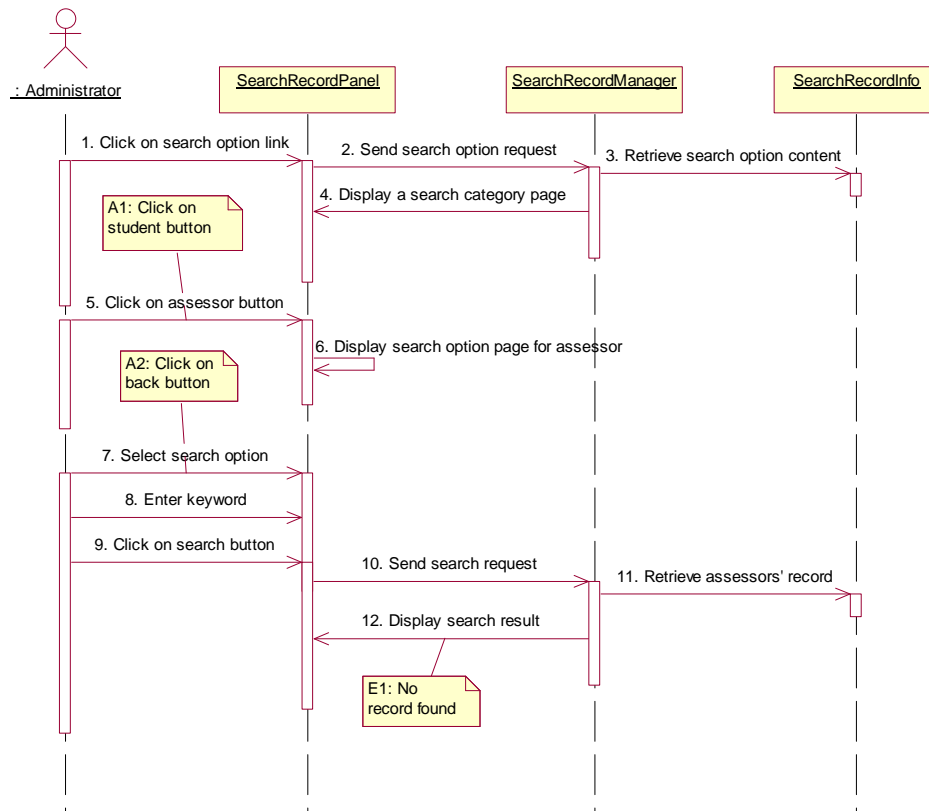
Search Record: [A1: Click on Student Button]   (SBAMS4ICT_07_02)
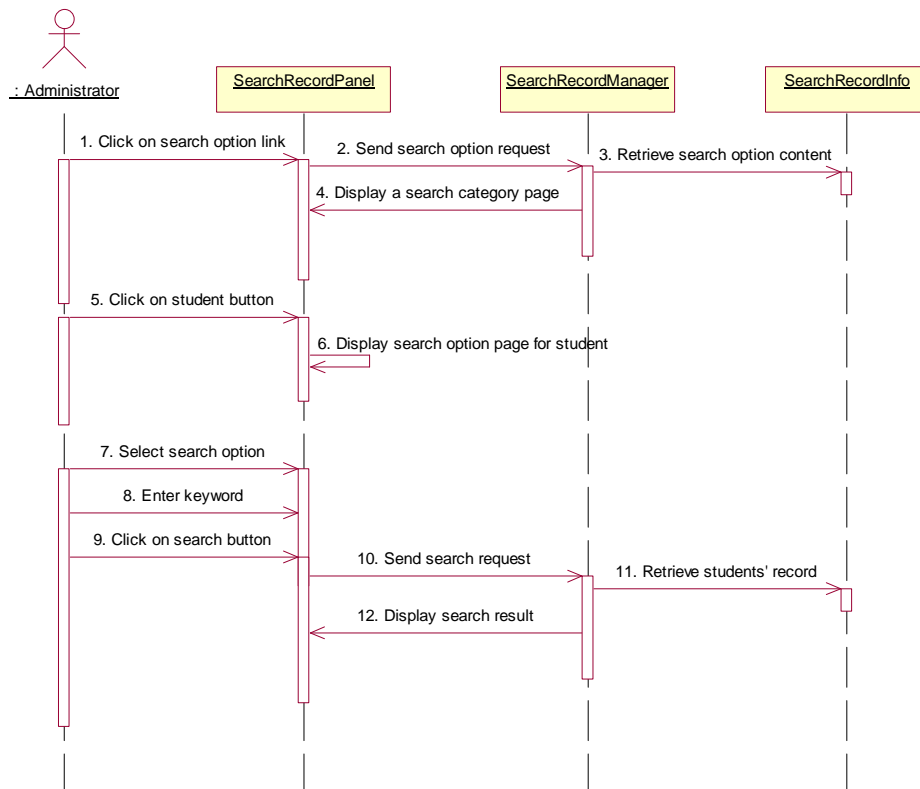
Search Record: [A2: Click on Back Button]   (SBAMS4ICT_07_03)
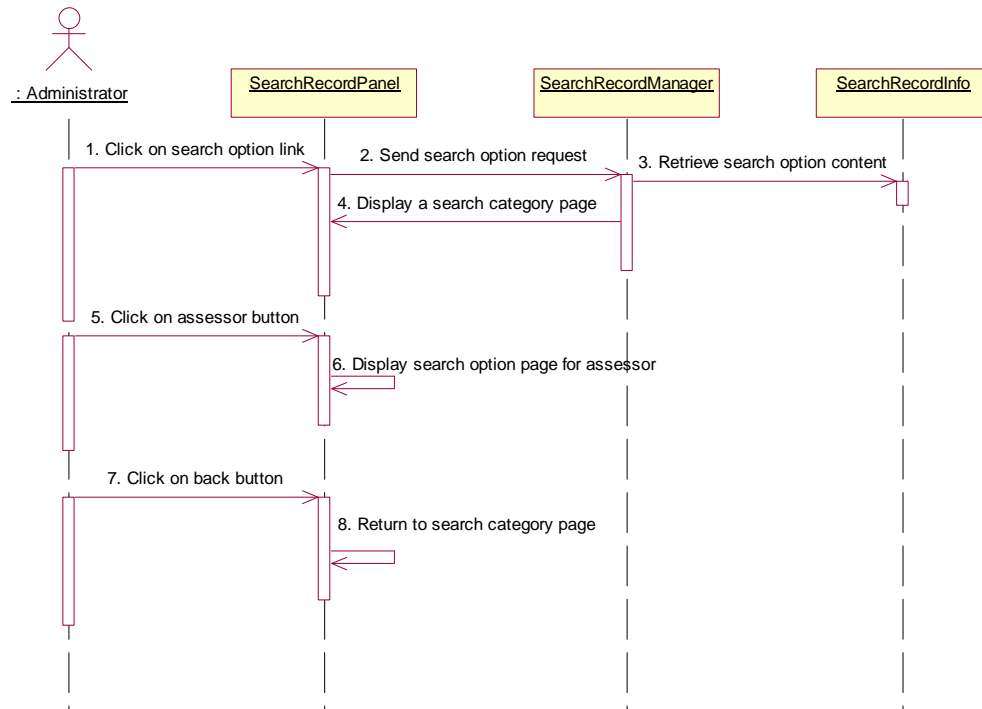
Search Record: [E1: No Record Found]   (SBAMS4ICT_07_04)
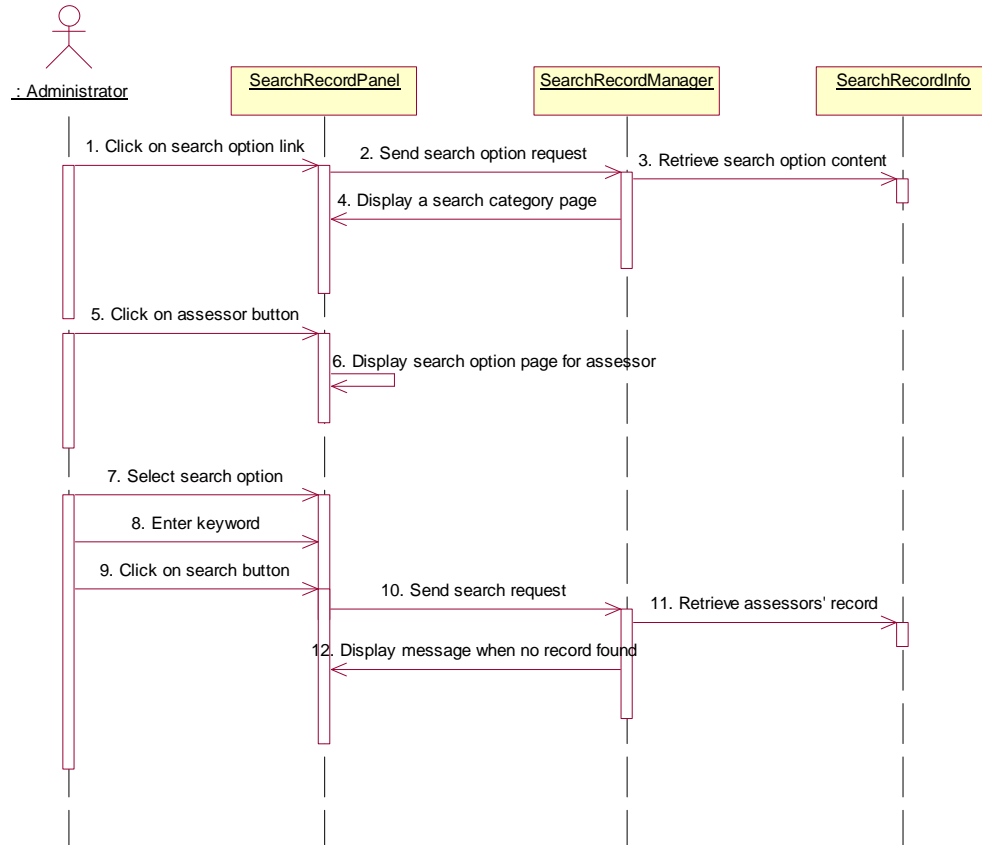
Reassign Student: Basic Flow (SBAMS4ICT_08_01)
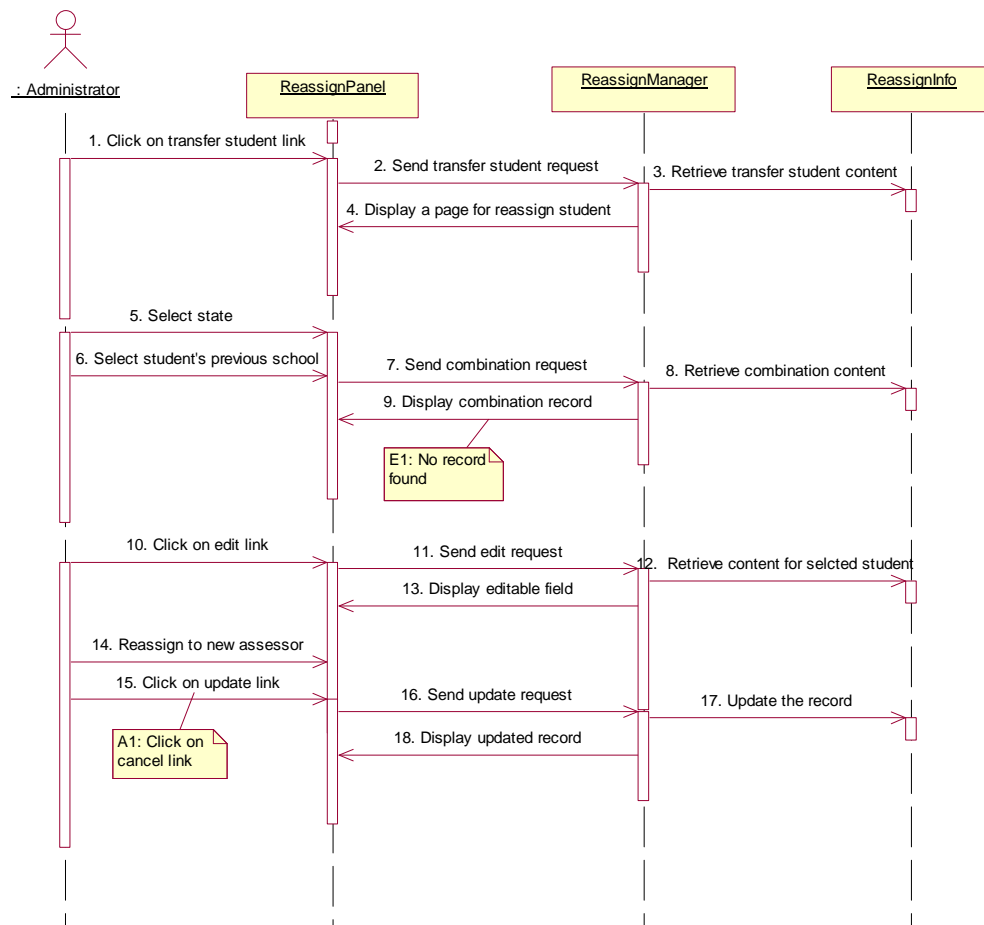
Reassign Student: [A1: Click on Cancel Link] (SBAMS4ICT_08_02)
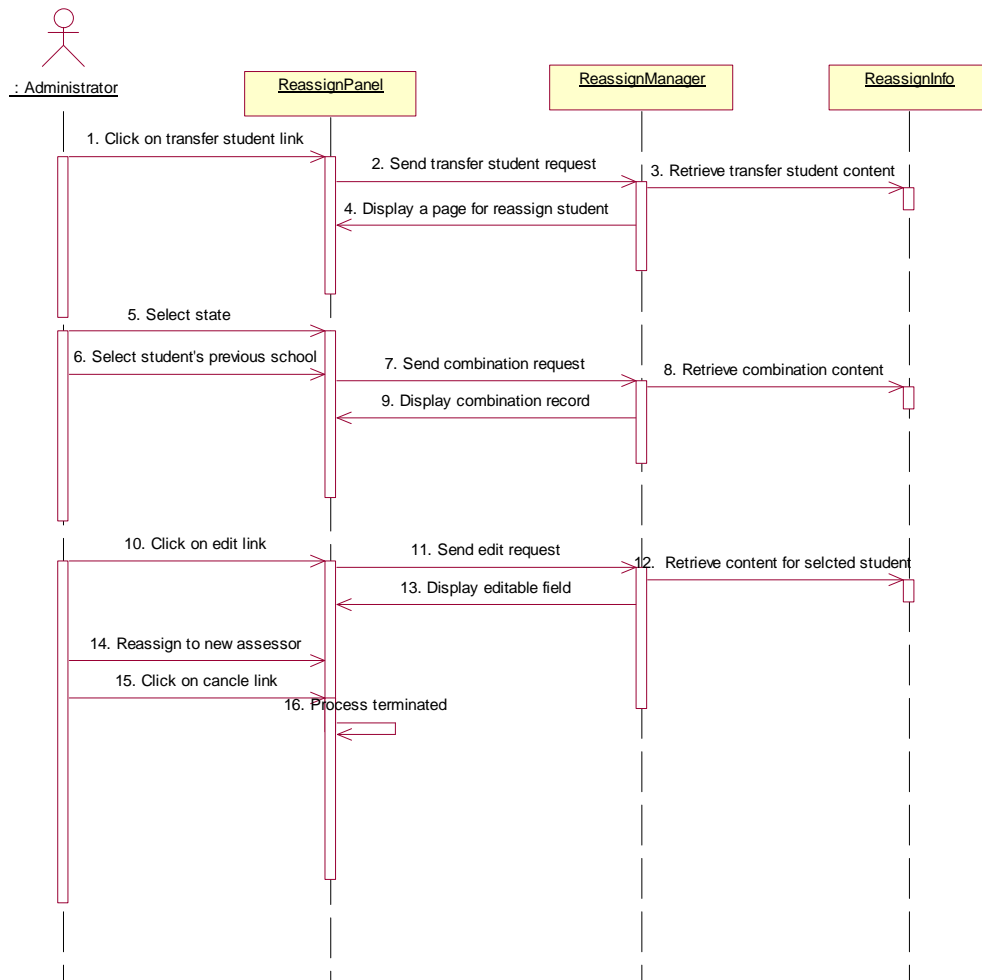
Reassign Student: [E1: No Record Found]　　(SBAMS4ICT_08_03)

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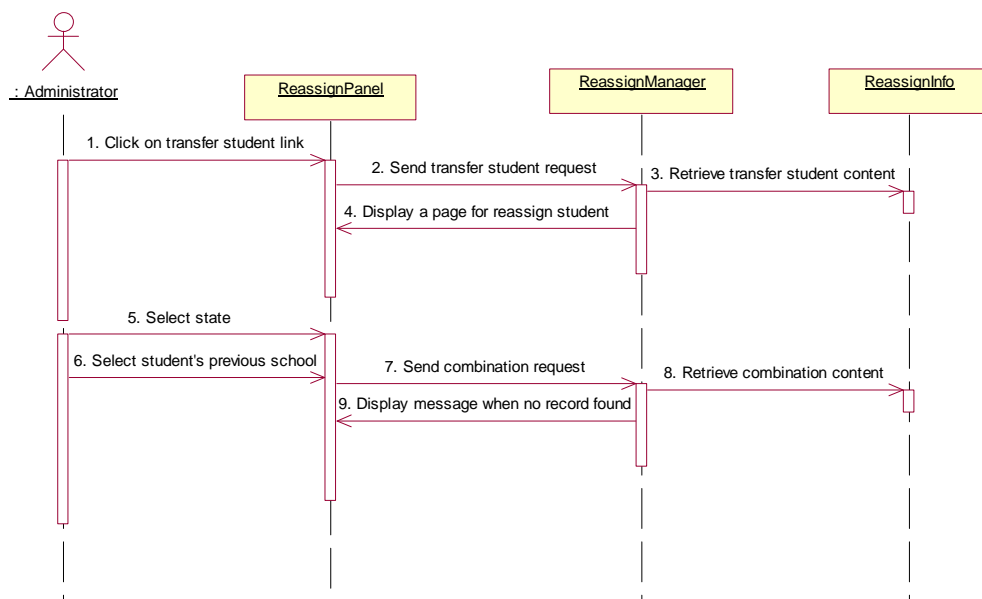
Manage User: Basic Flow   (SBAMS4ICT_09_01)
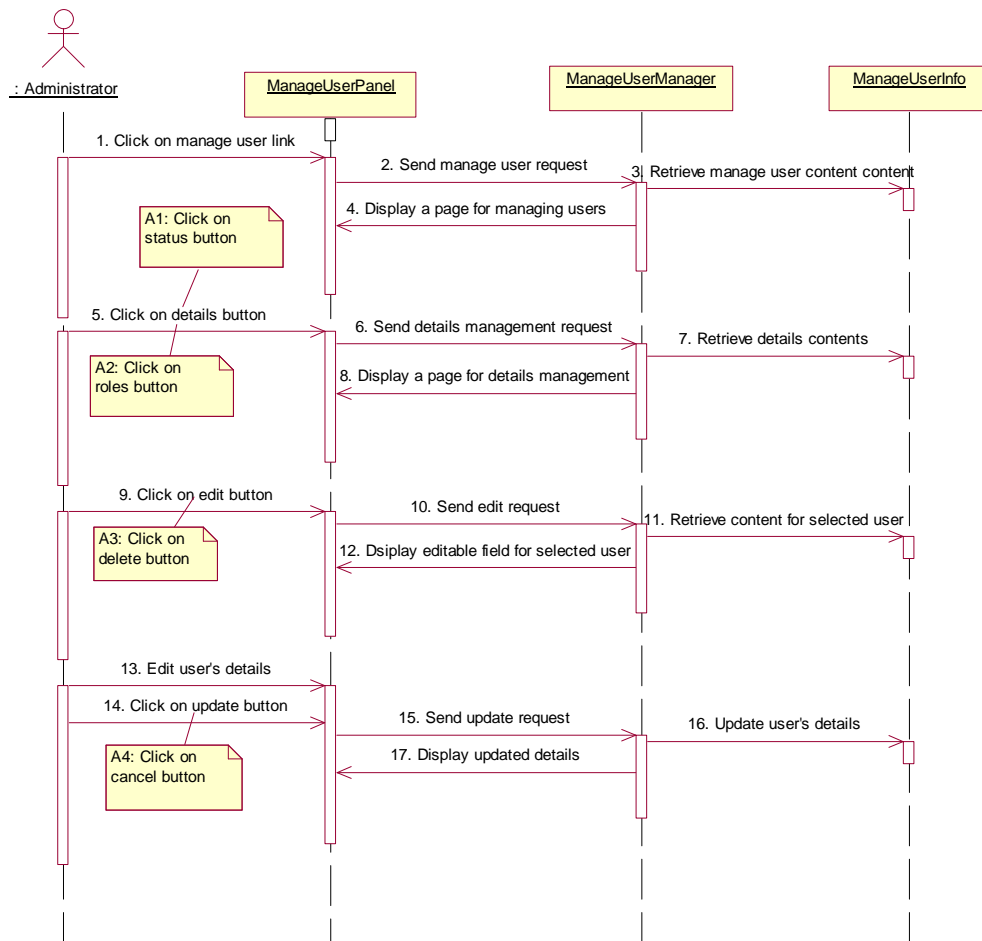
Manage User: [A1: Click on Status Button]   (SBAMS4ICT_09_02)
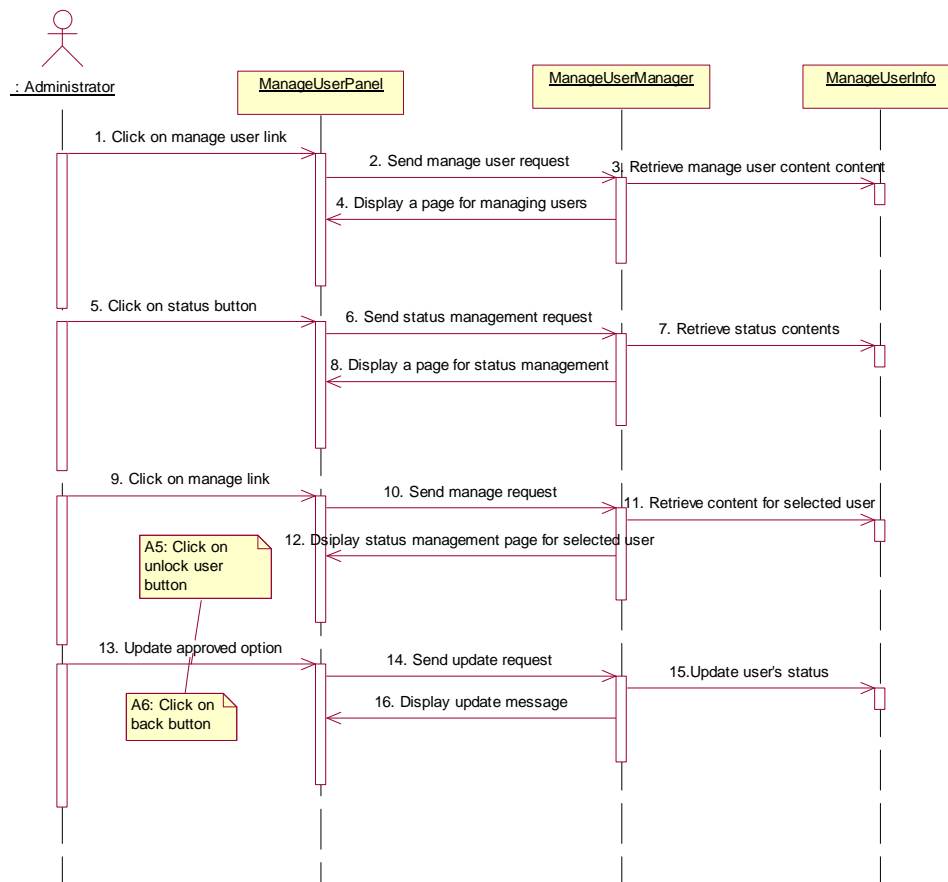
Manage User: [A2: Click on Roles Button]   (SBAMS4ICT_09_03)
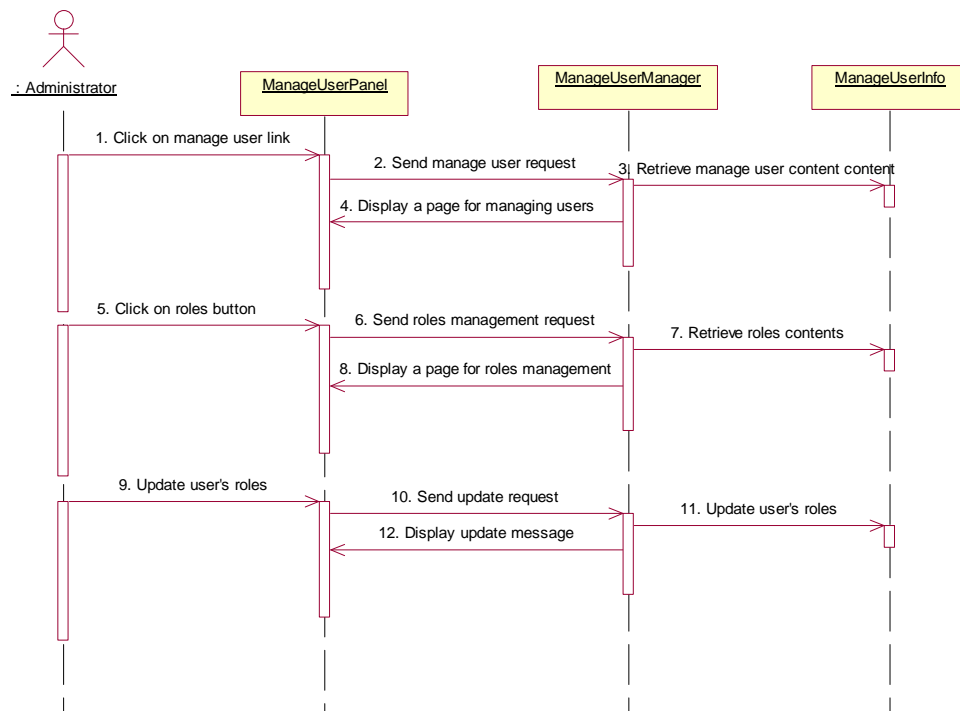
Manage User: [A3: Click on Delete Button]   (SBAMS4ICT_09_04)
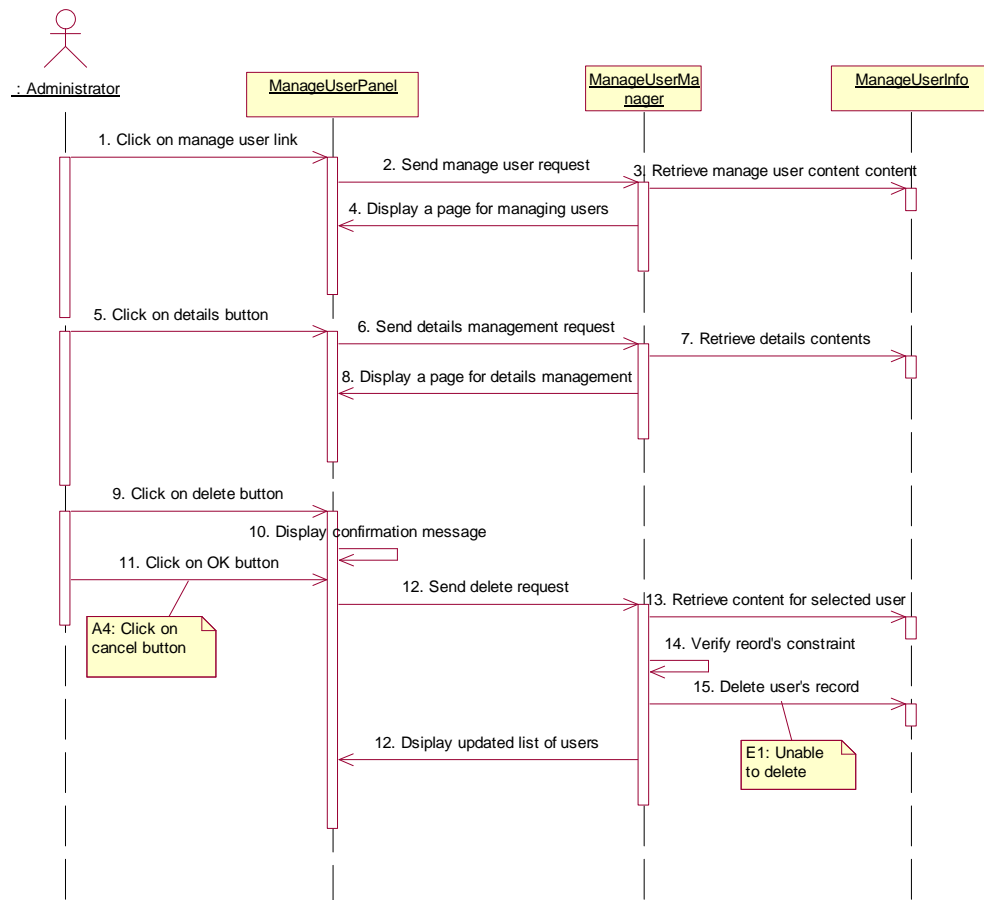
Manage User: [A4: Click on Cancel Button]   (SBAMS4ICT_09_05)
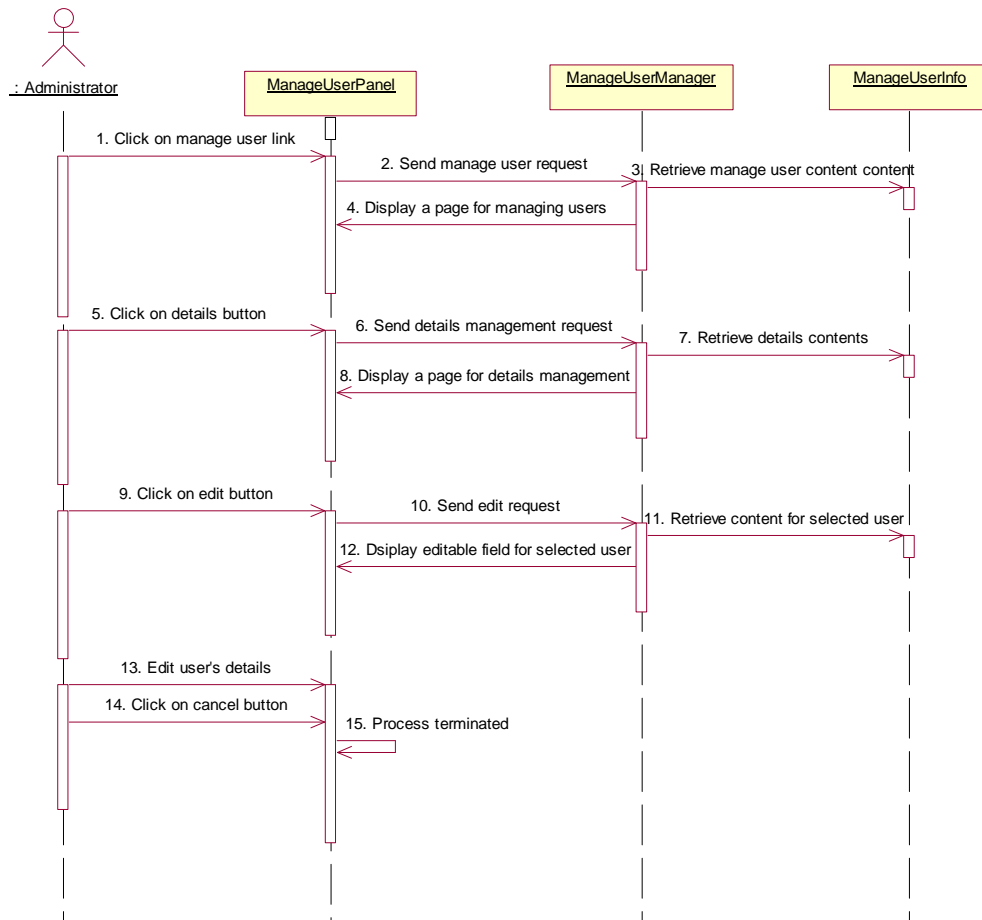
Manage User: [A5: Click on Unlock User Button]   (SBAMS4ICT_09_06)
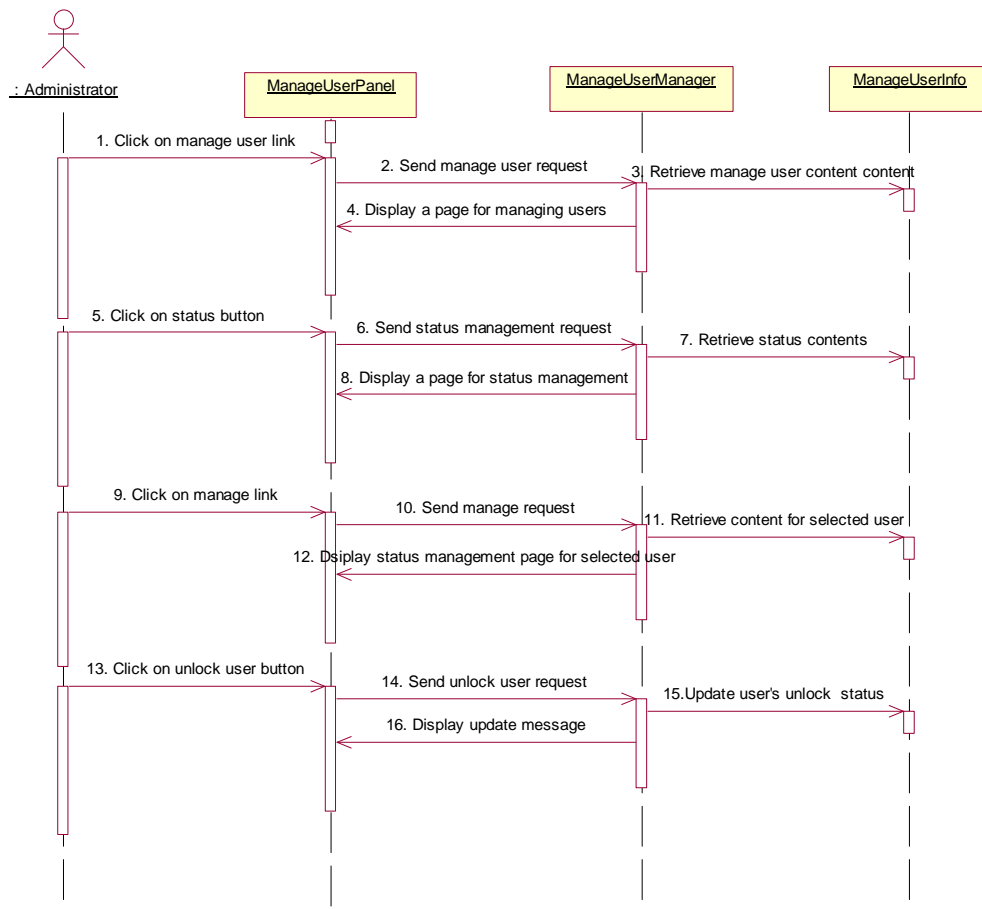
Manage User: [A6: Click on Back Button]   (SBAMS4ICT_09_07)
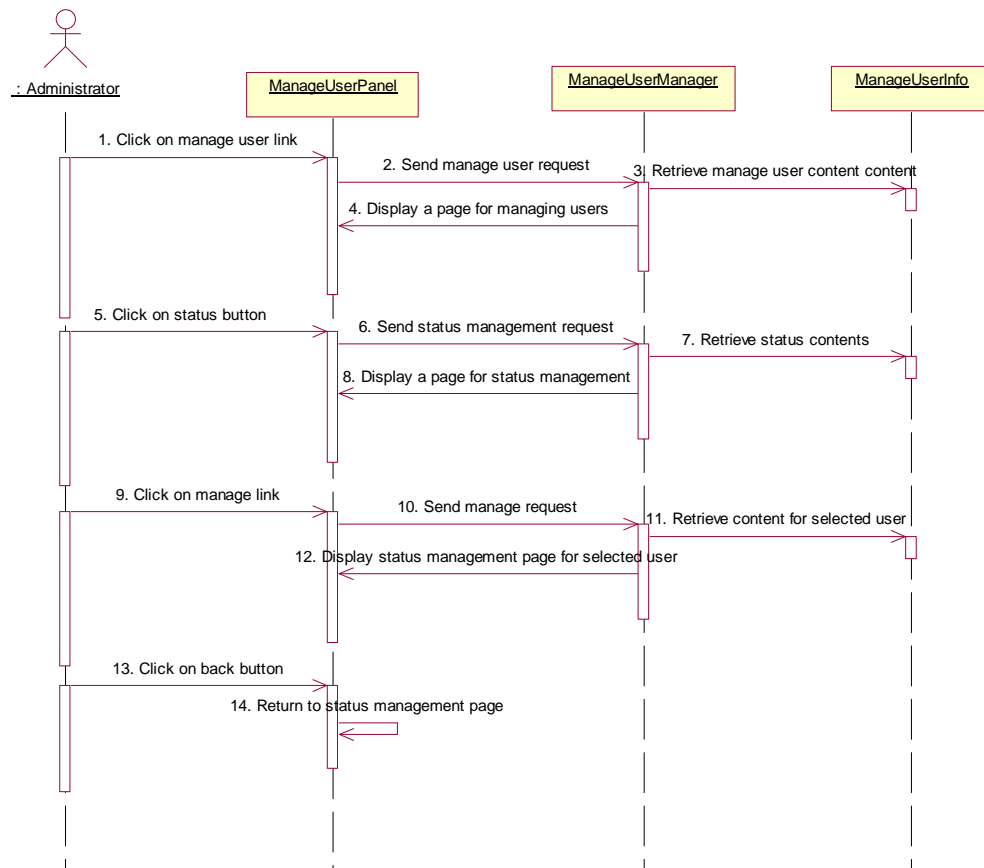
Manage User: [E1: Unable to Delete] (SBAMS4ICT_09_08)
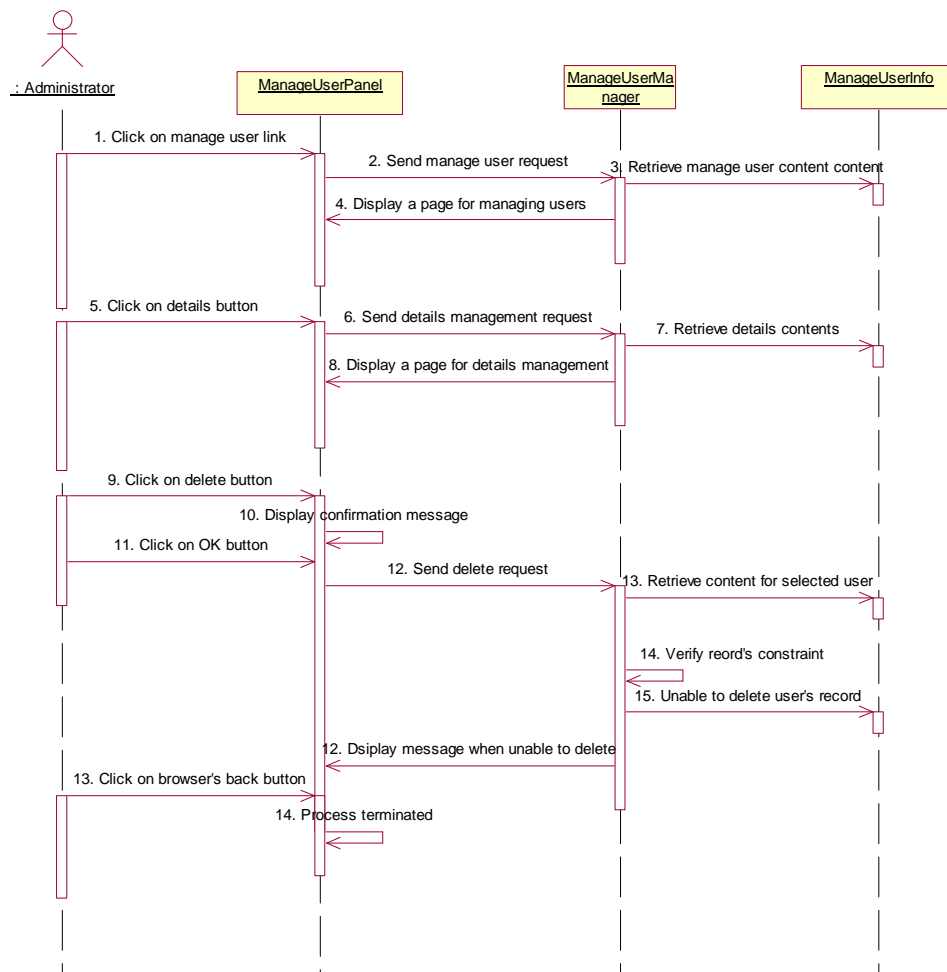
Manage Role: Basic Flow   (SBAMS4ICT_10_01)
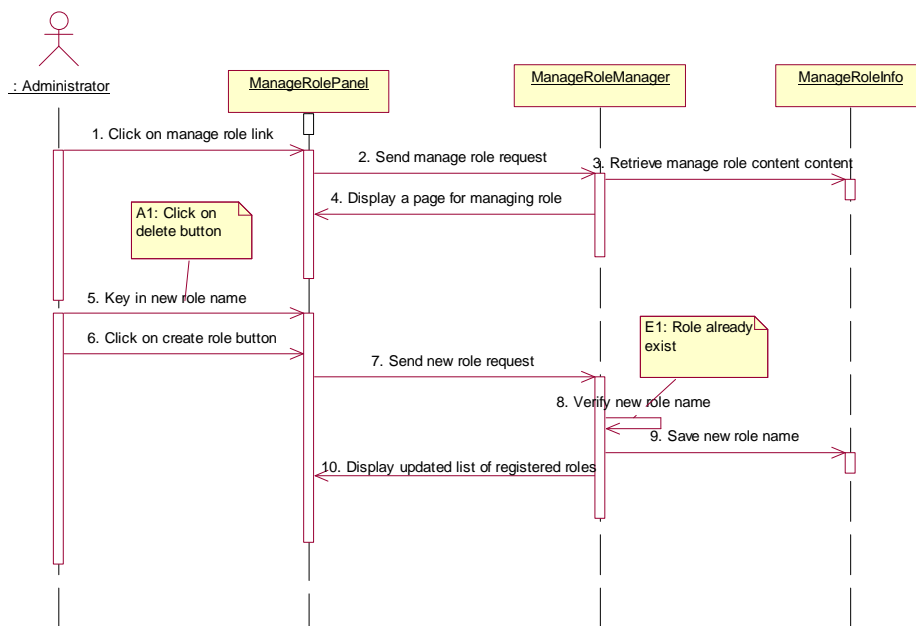
Manage Role: [A1: Click on Delete Role Button]   (SBAMS4ICT_10_02)
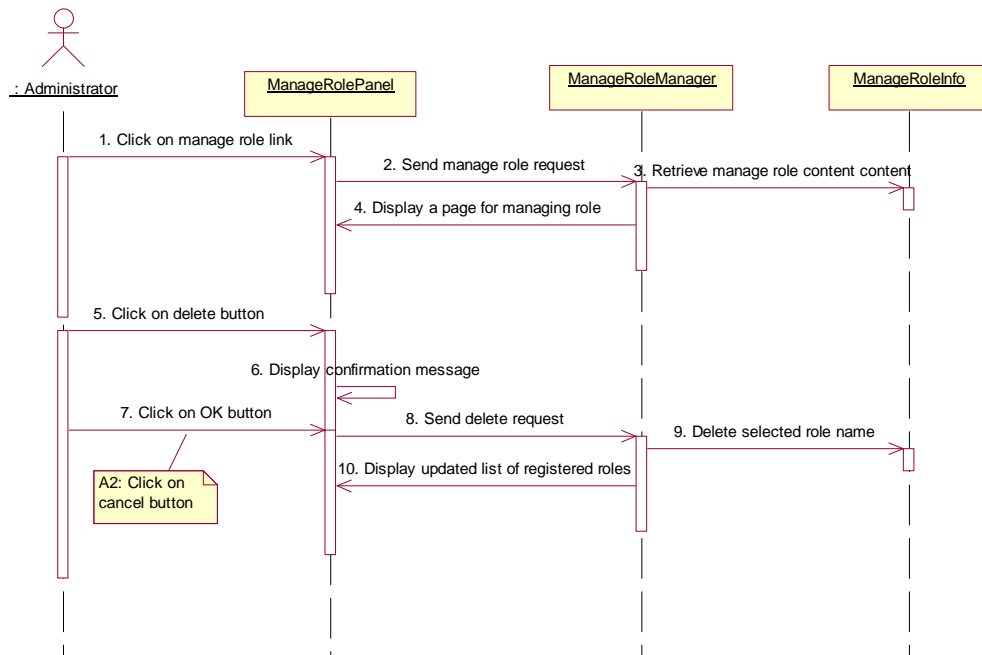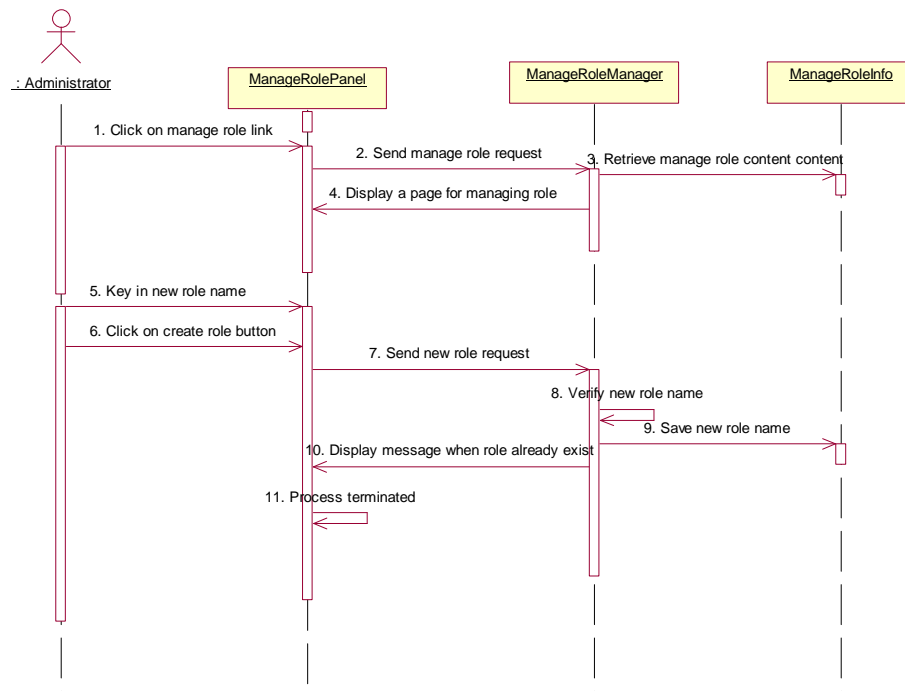

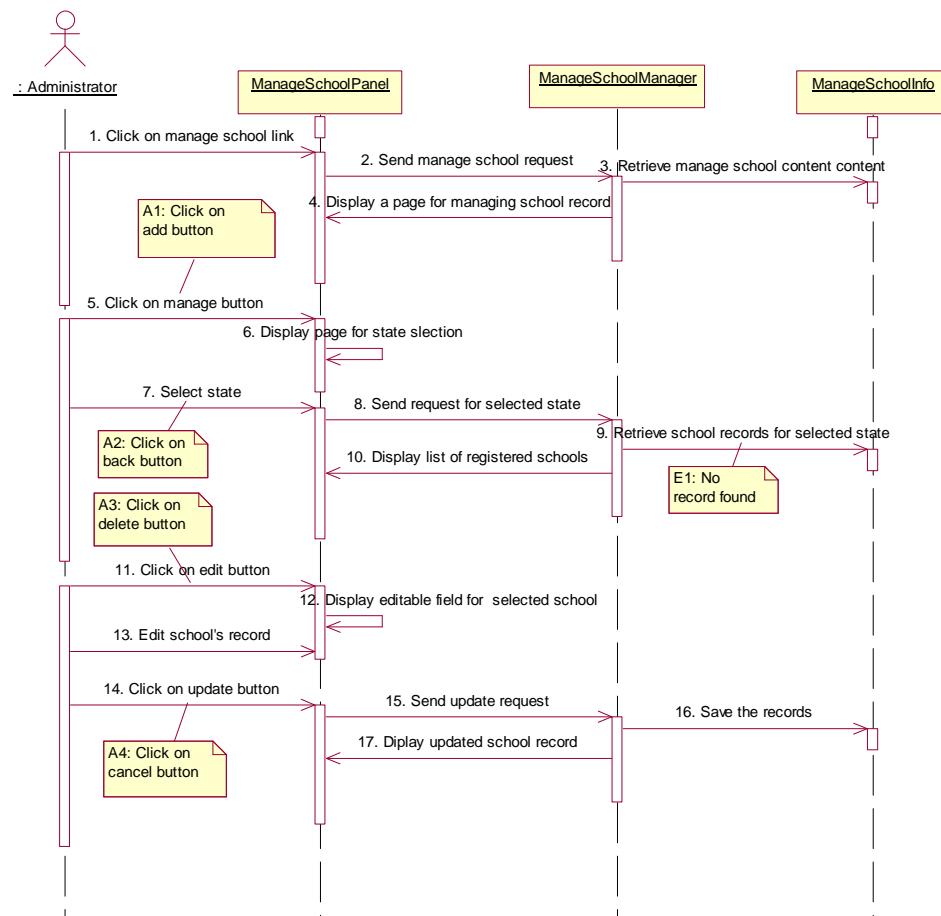**Manage Role: [A2: Click on Cancel Button]   (SBAMS4ICT_10_03)**
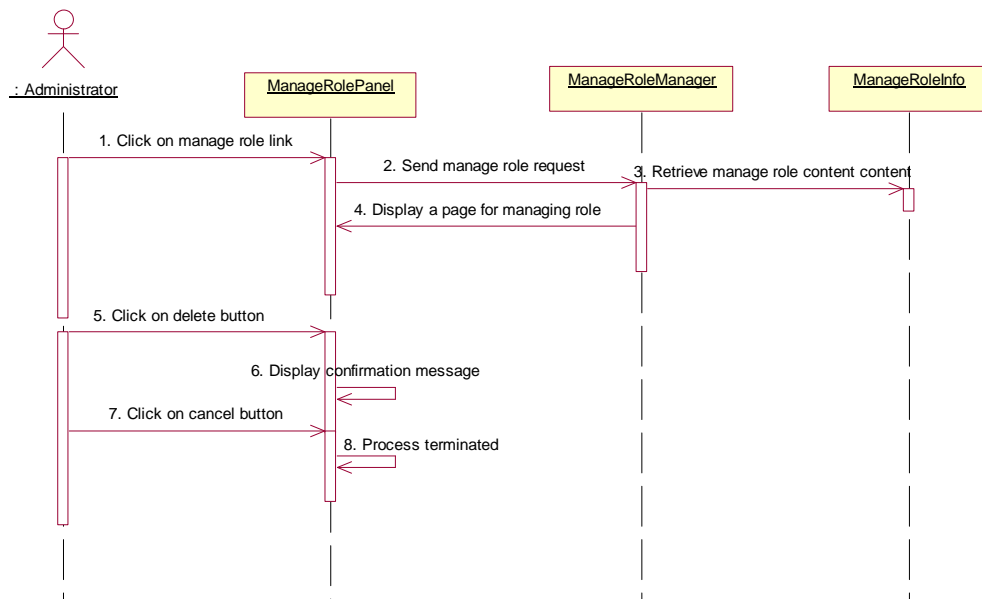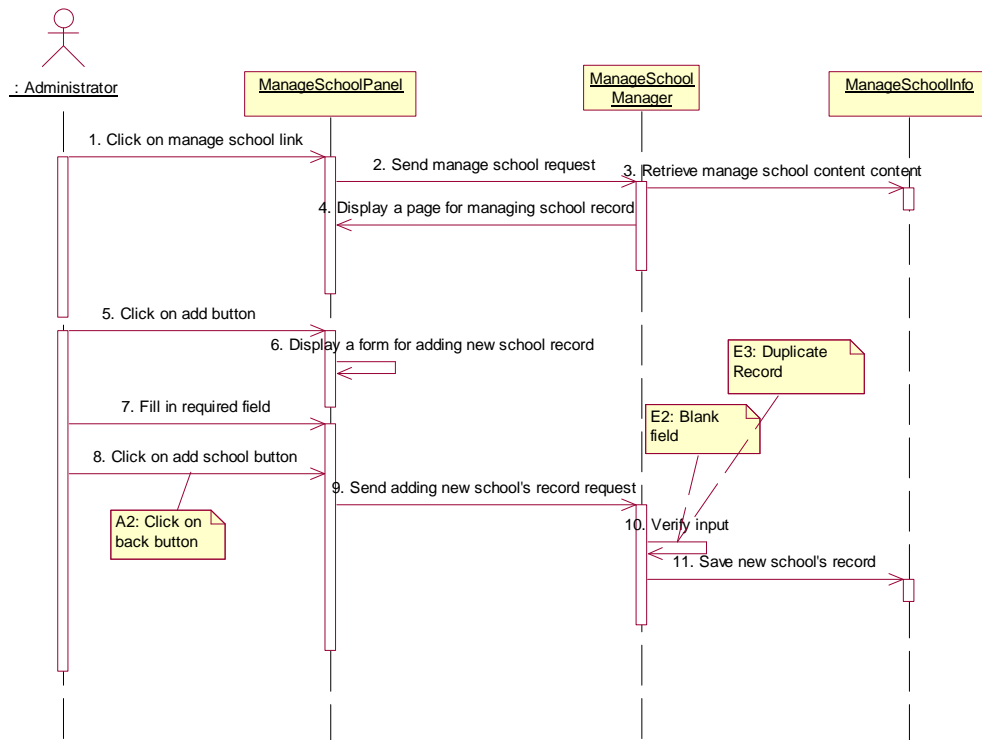
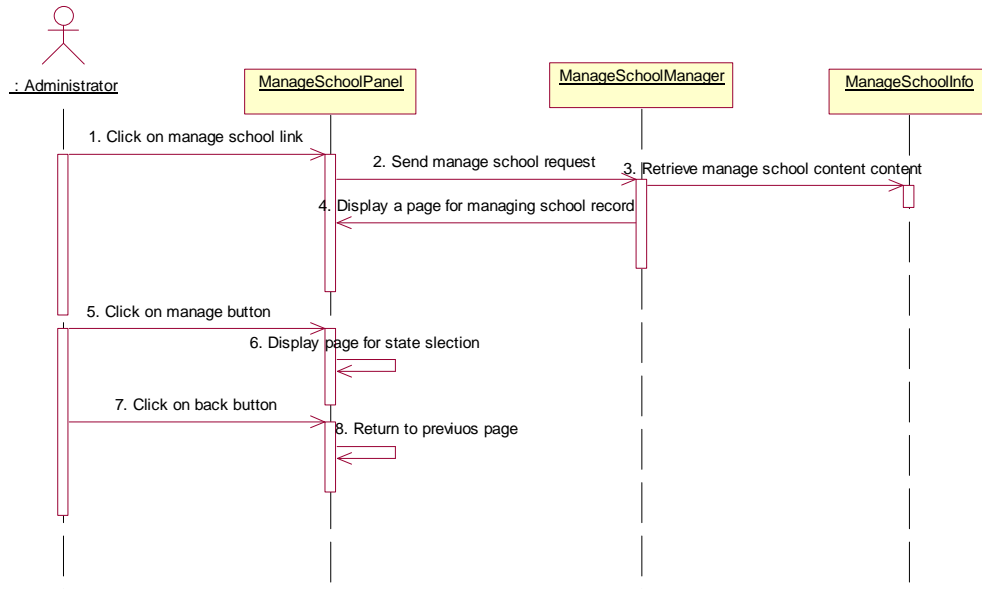**Manage Role: [E1: Role Already Exist]   (SBAMS4ICT_10_04)**

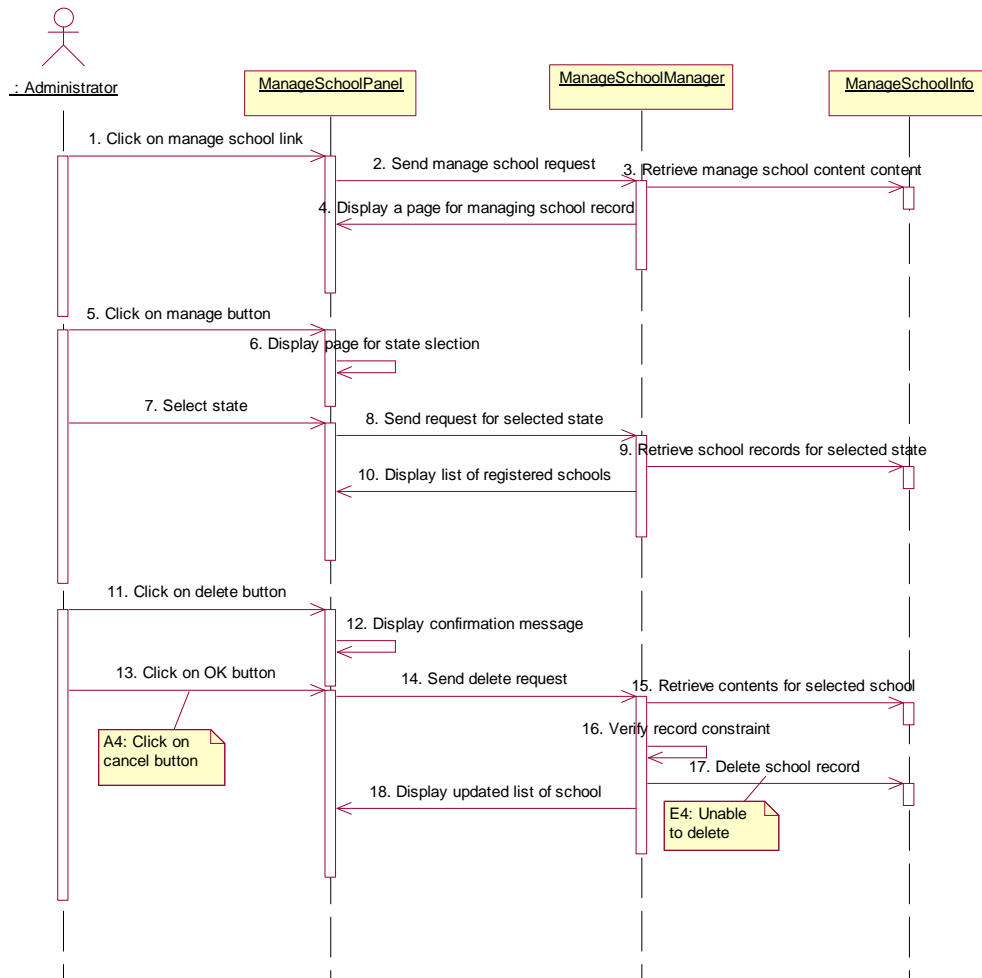**Manage School: Basic Flow   (SBAMS4ICT_11_01)**

Manage School: [A1: Click on Add Button]   (SBAMS4ICT_11_02)

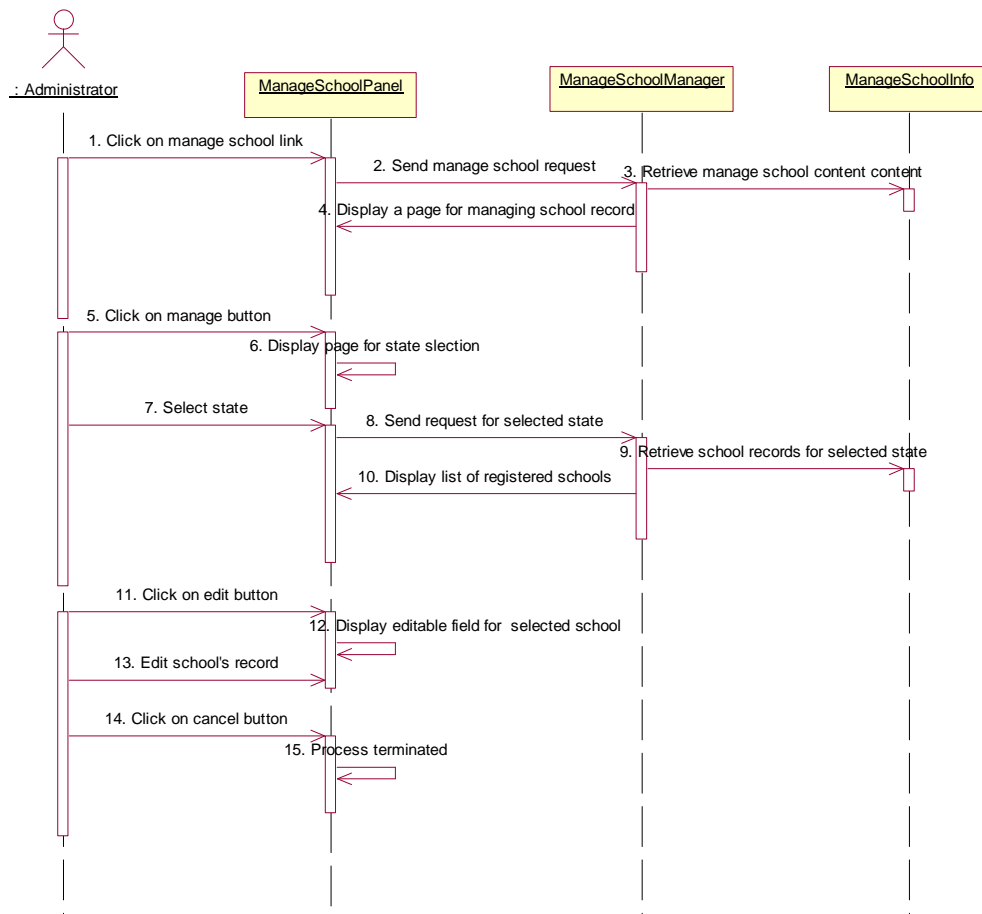**Manage School: [A2: Click on Back Button]   (SBAMS4ICT_11_03)**

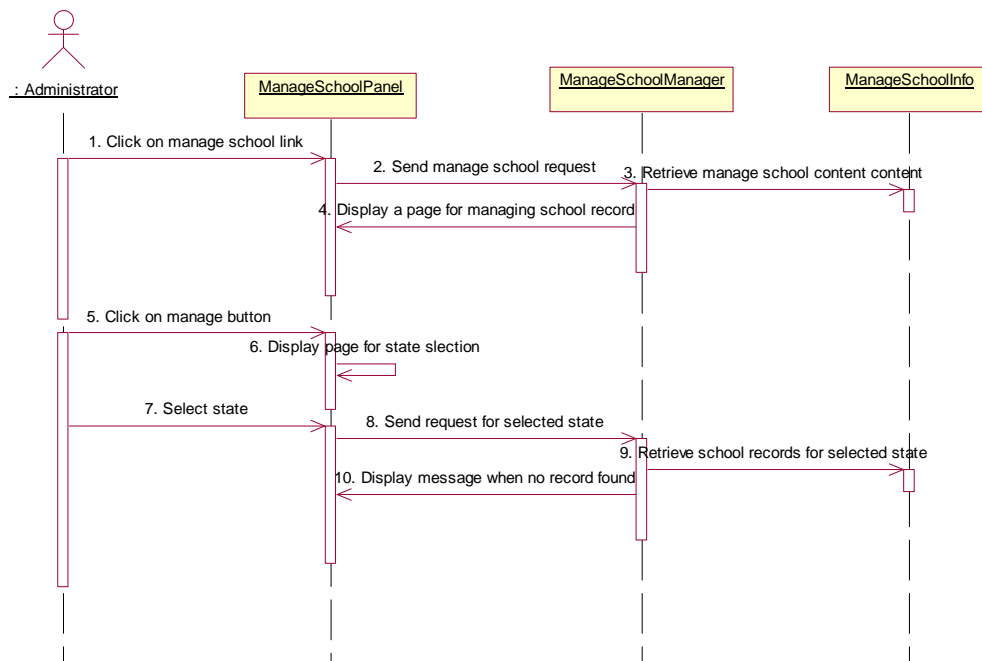**Manage School: [A3: Click on Delete Button] (SBAMS4ICT_11_04)**

Manage School: [A4: Click on Cancel Button](SBAMS4ICT_11_05)

Manage School: [E1: No Record Found]   (SBAMS4ICT_11_06)

Manage School: [E2: Blank Field]   **(SBAMS4ICT_11_07)**
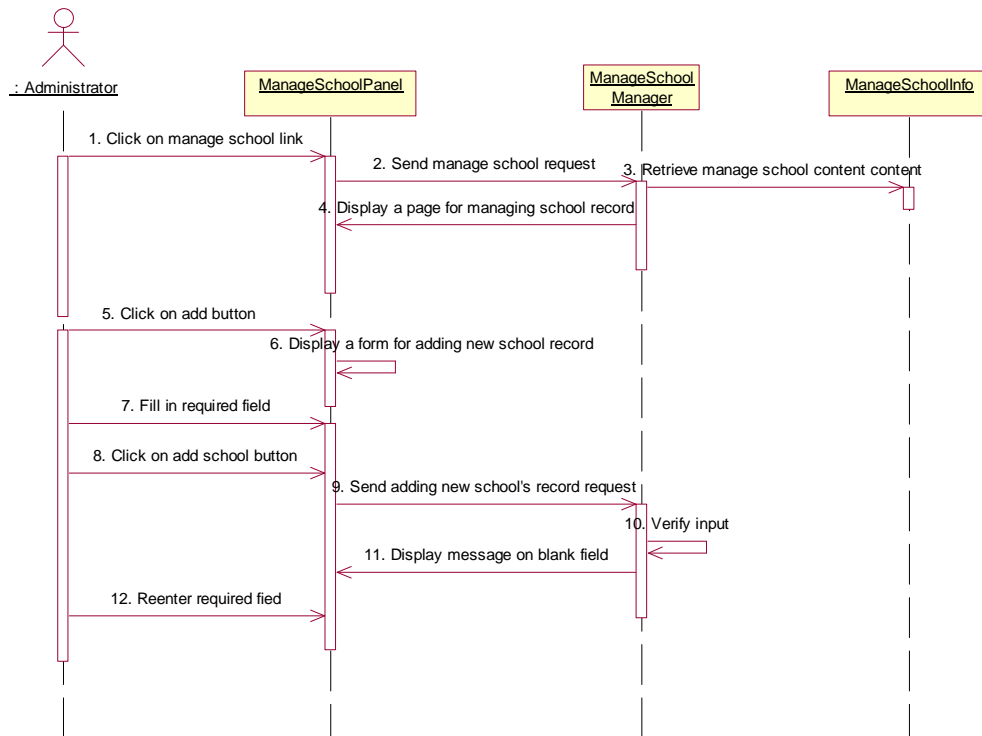
Manage School: [E3: Duplicate Record]   **(SBAMS4ICT_11_08)**
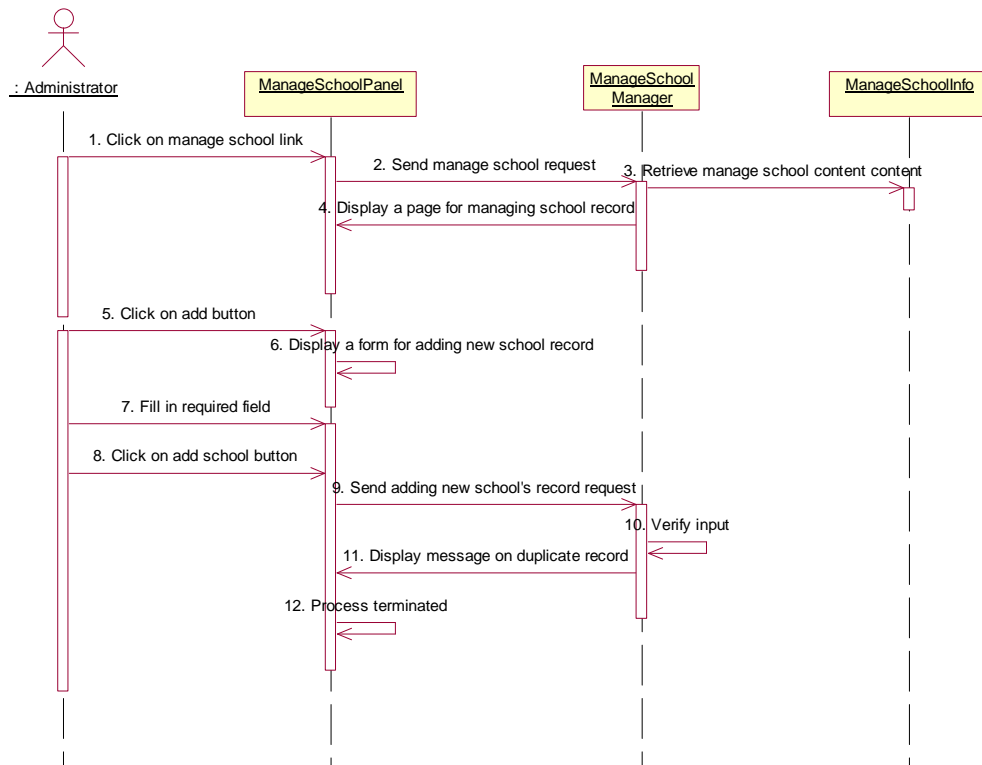
Manage School: [E4: Unable to Delete]   (SBAMS4ICT_11_09)
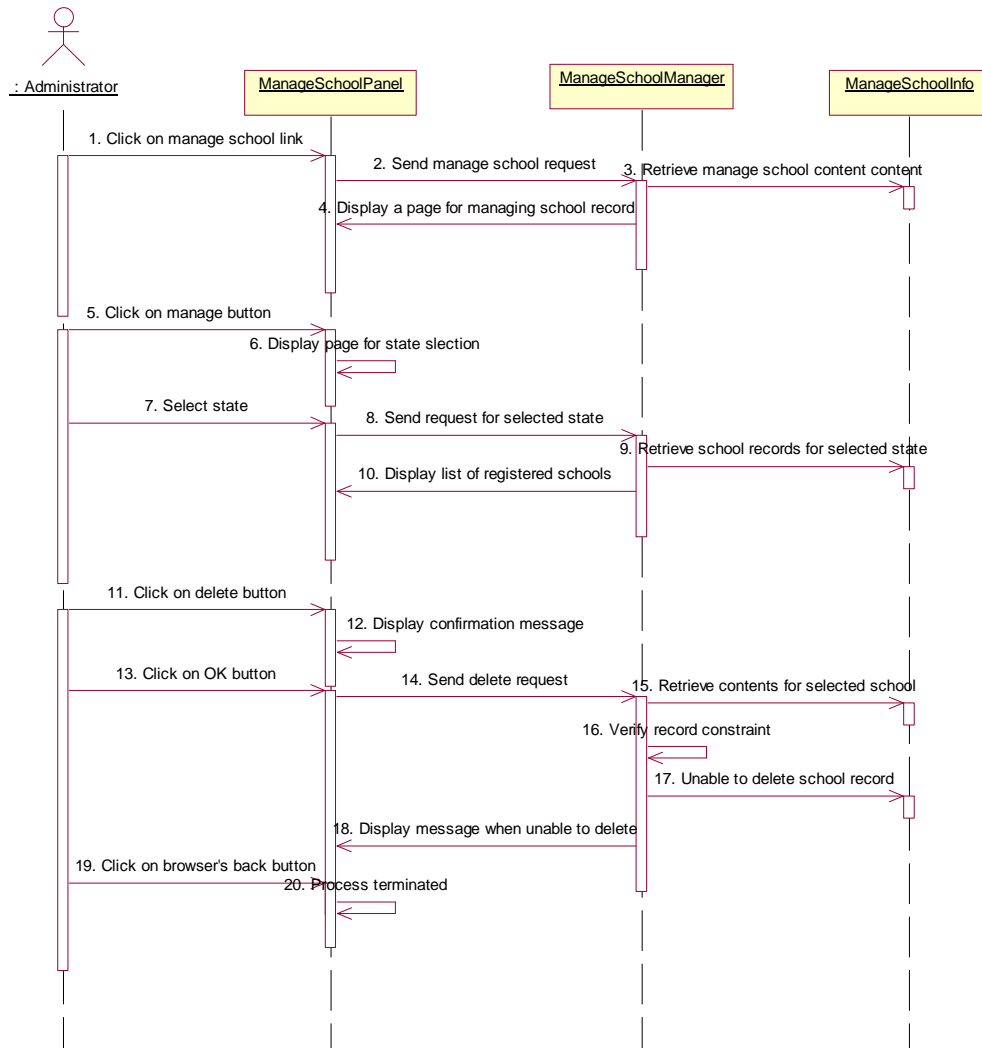
Manage District and State: Basic Flow   (SBAMS4ICT_12_01)
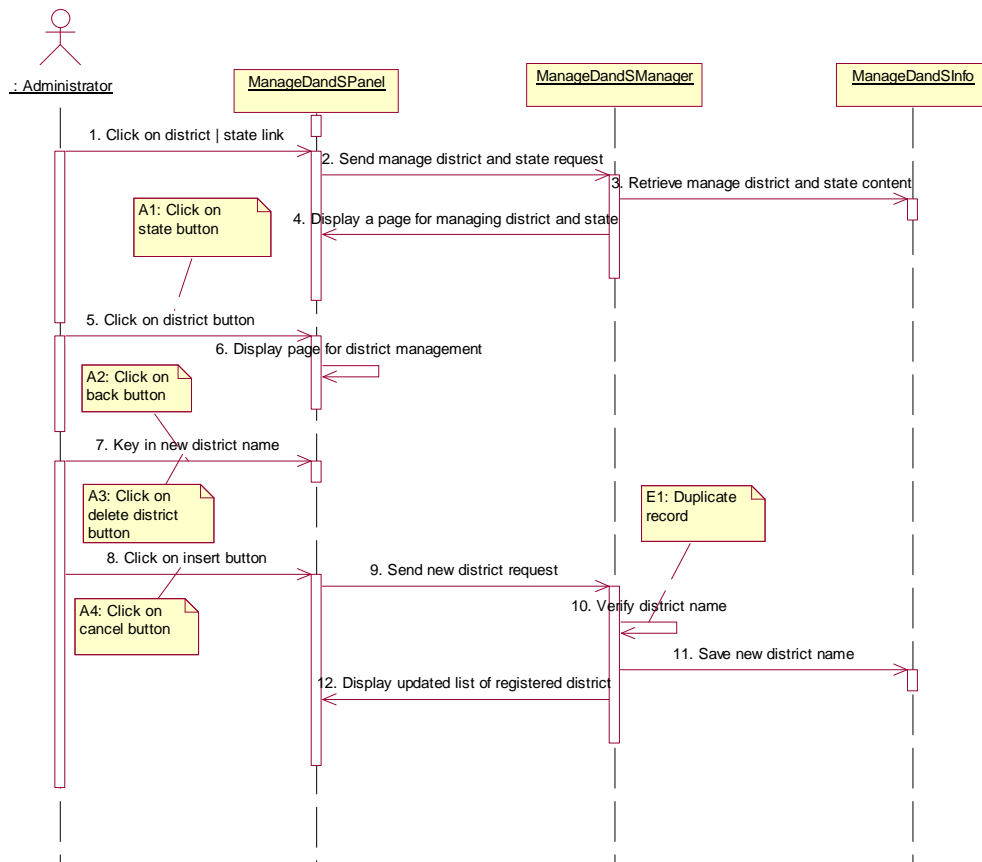
Manage District and State: [A1: Click on State Button]   (SBAMS4ICT_12_02)
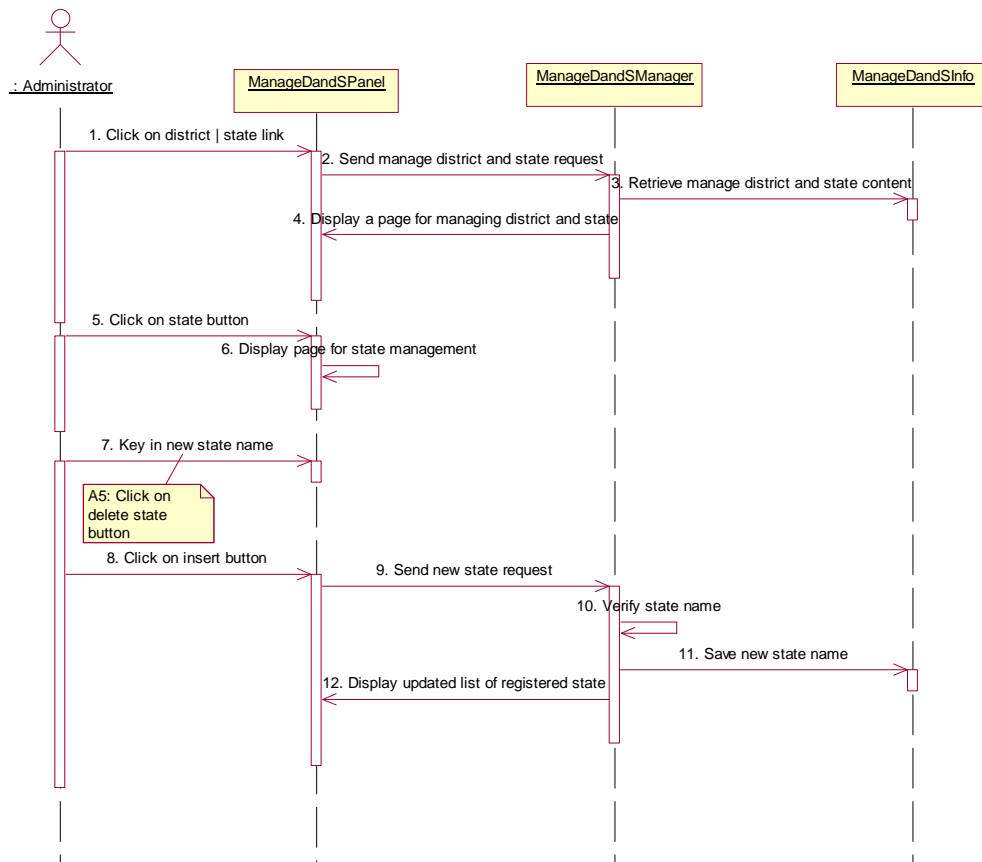
Manage District and State: [A2: Click on Back Button]   (SBAMS4ICT_12_03)
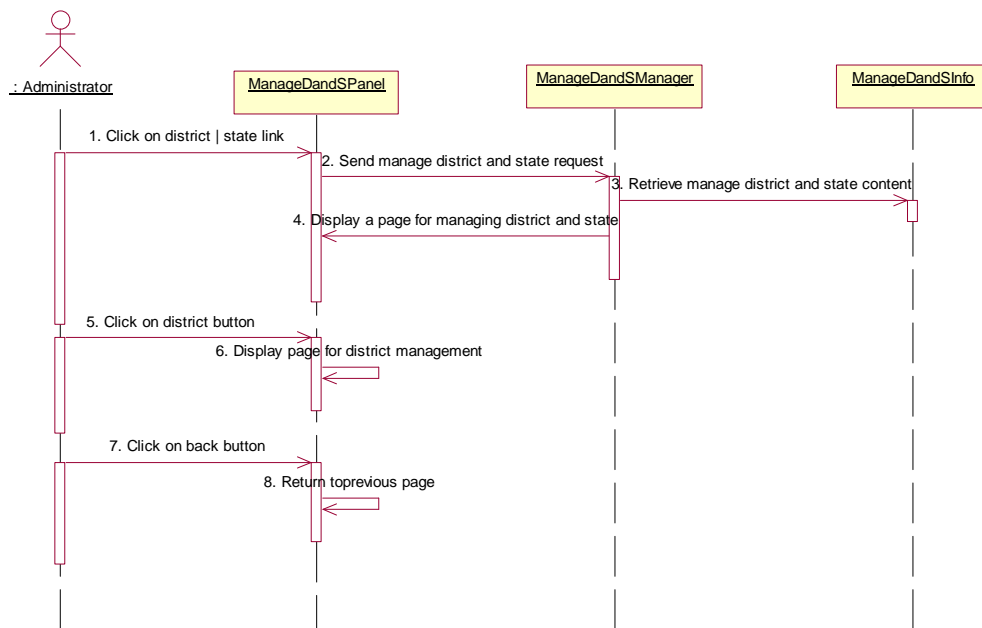
Manage District and State: [A3: Click on Delete District Button] (SBAMS4ICT_12_04)
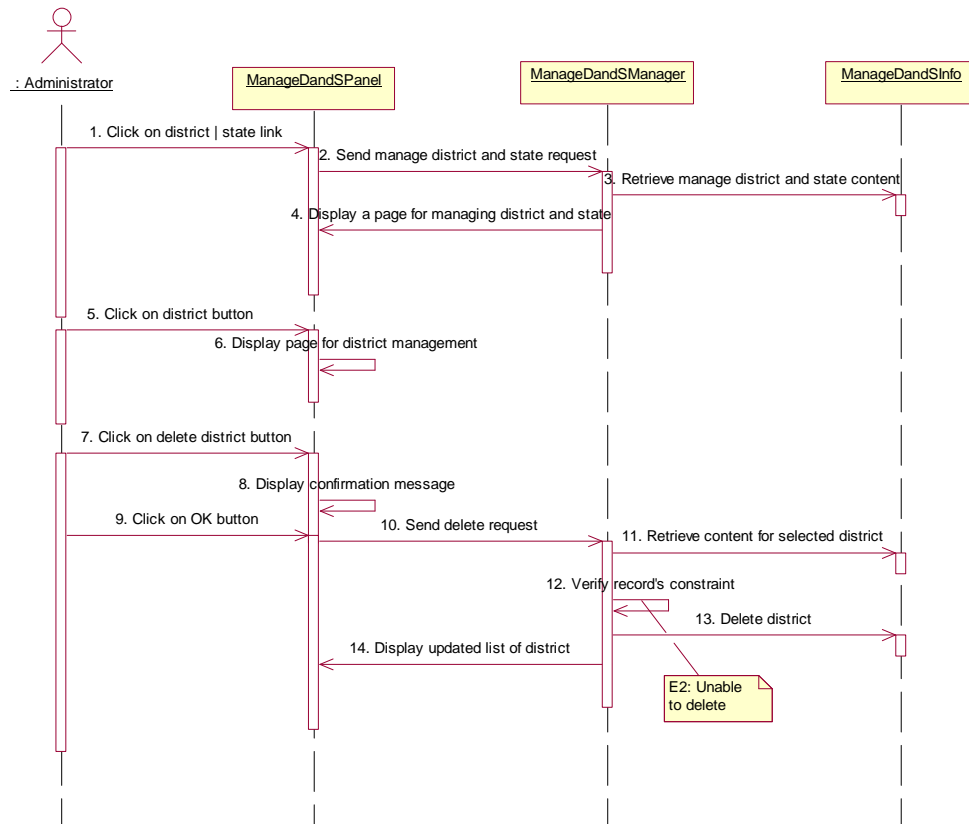
Manage District and State: [A4: Click on Cancel Button]   (SBAMS4ICT_12_05)
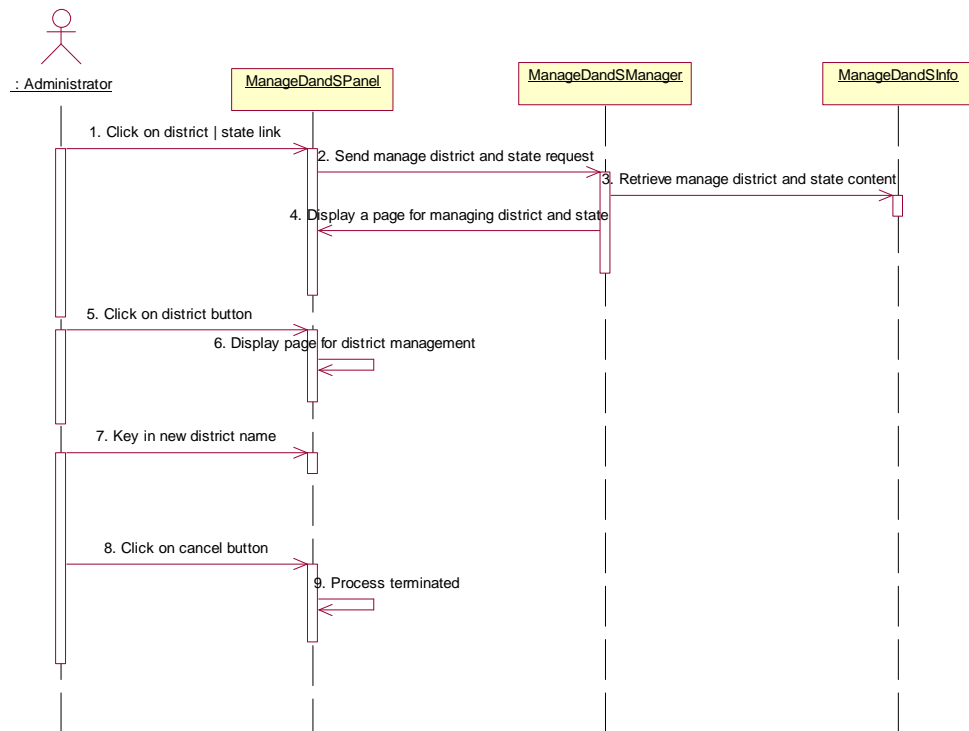
Manage District and State: [A5: Click on Delete State Button] (SBAMS4ICT_12_06)
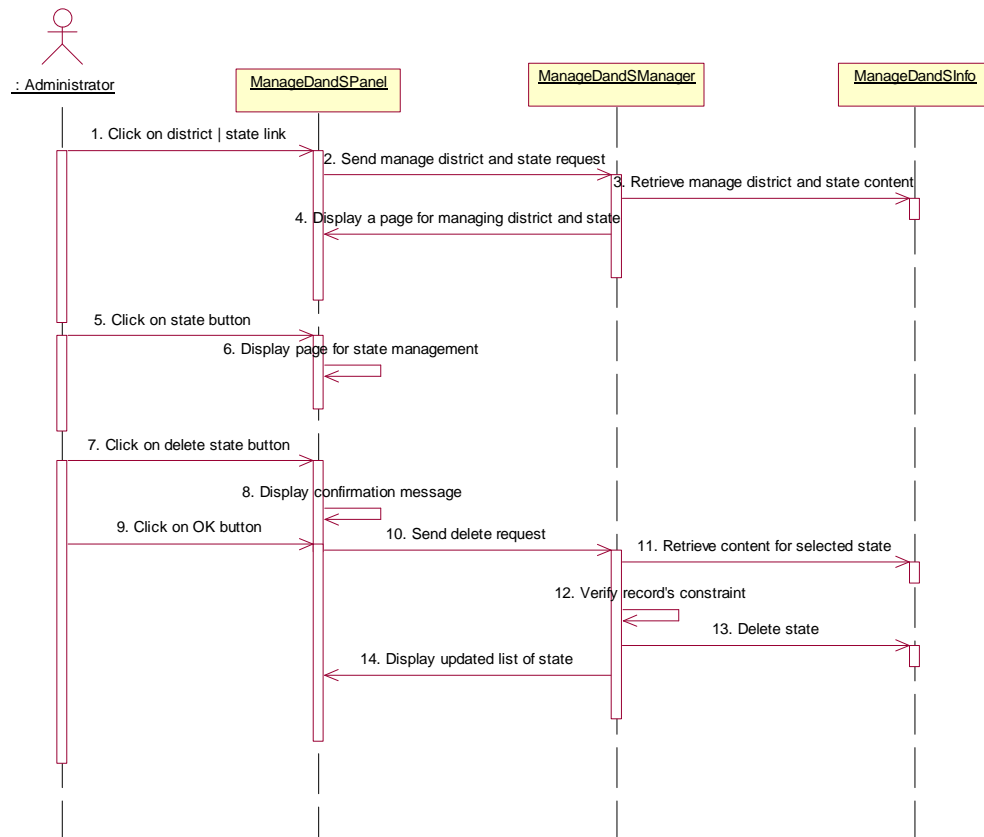
Manage District and State: [E1: Duplicate Record]   (SBAMS4ICT_12_07)
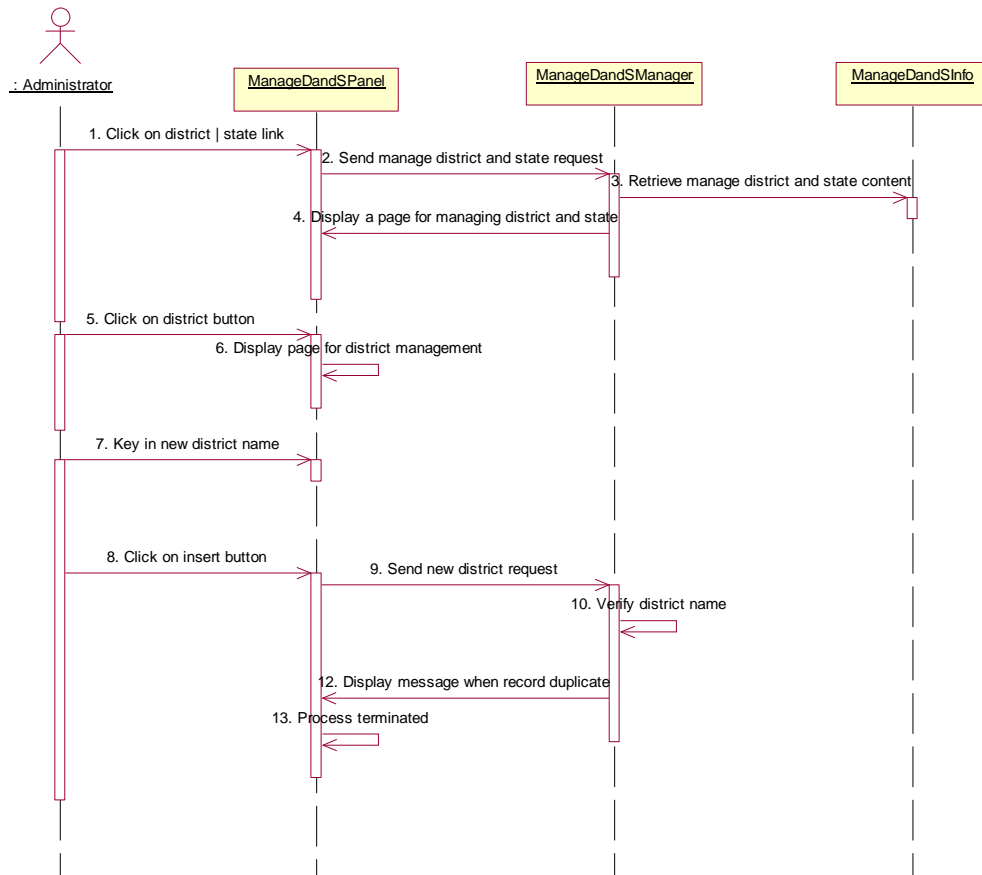
Manage District and State: [E1: Unable to Delete]   (SBAMS4ICT_12_08)
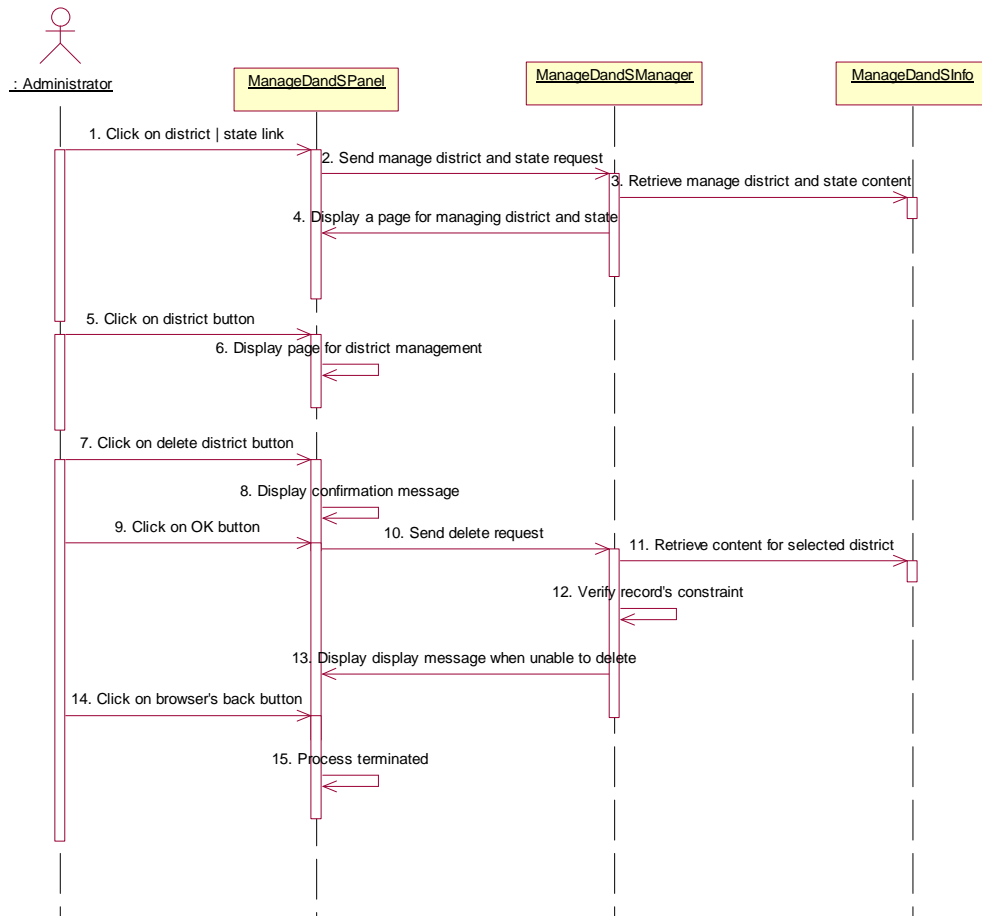
Manage SPM Year: Basic Flow   (SBAMS4ICT_13_01)
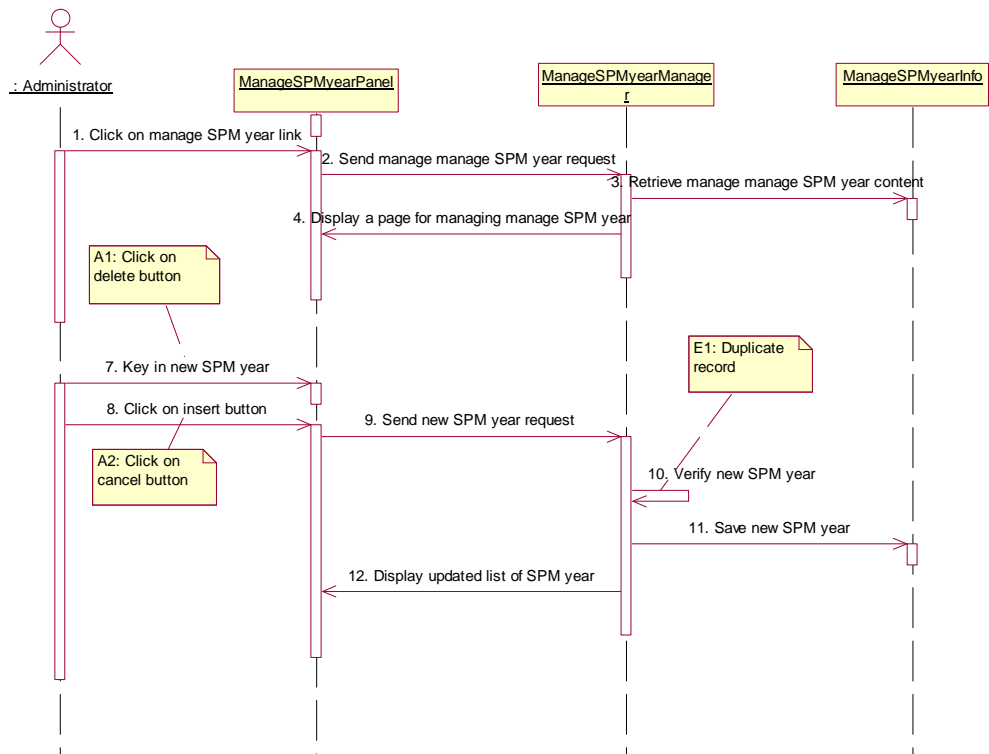
Manage SPM Year: [A1: Click on Delete Button]   (SBAMS4ICT_13_02)
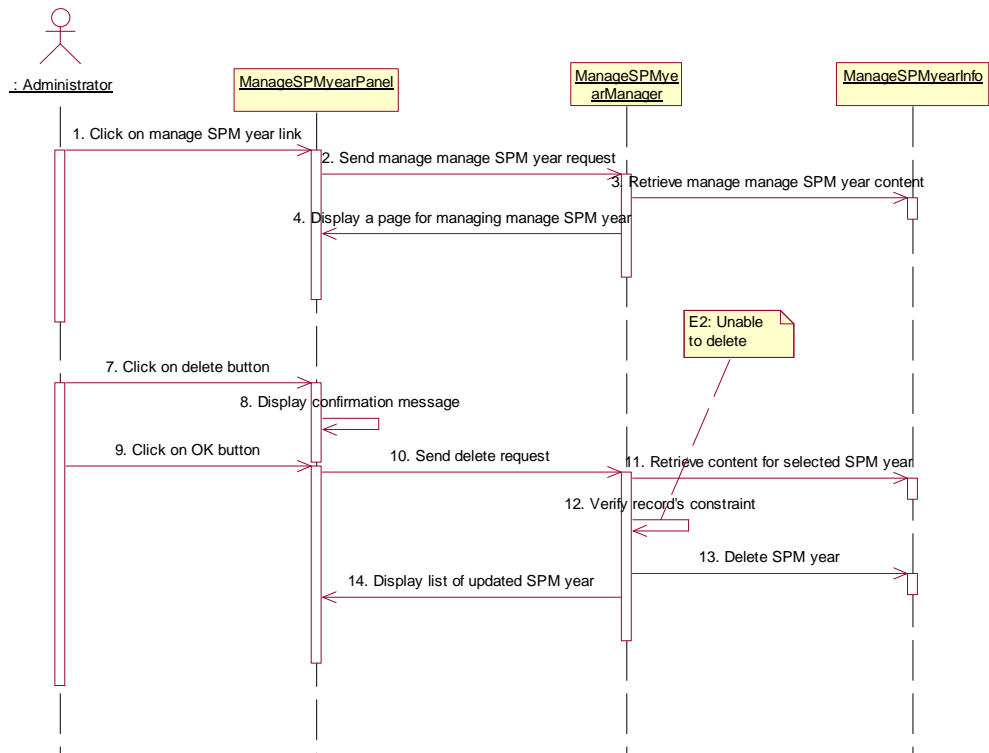
Manage SPM Year: [A2: Click on Cancel Button]   (SBAMS4ICT_13_03)
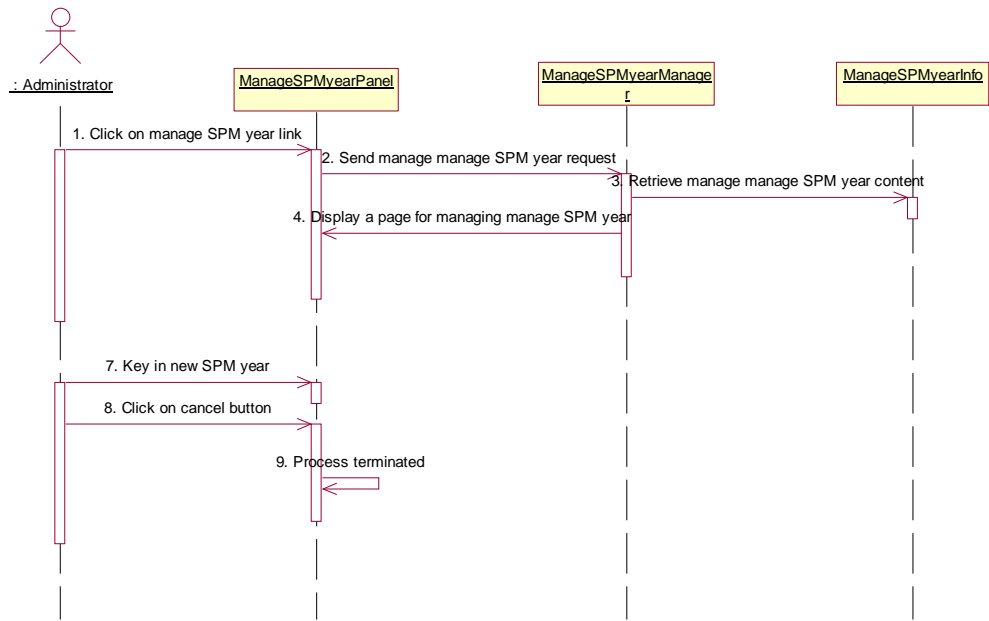
Manage SPM Year: [E1: Duplicate Record]   (SBAMS4ICT_13_04)
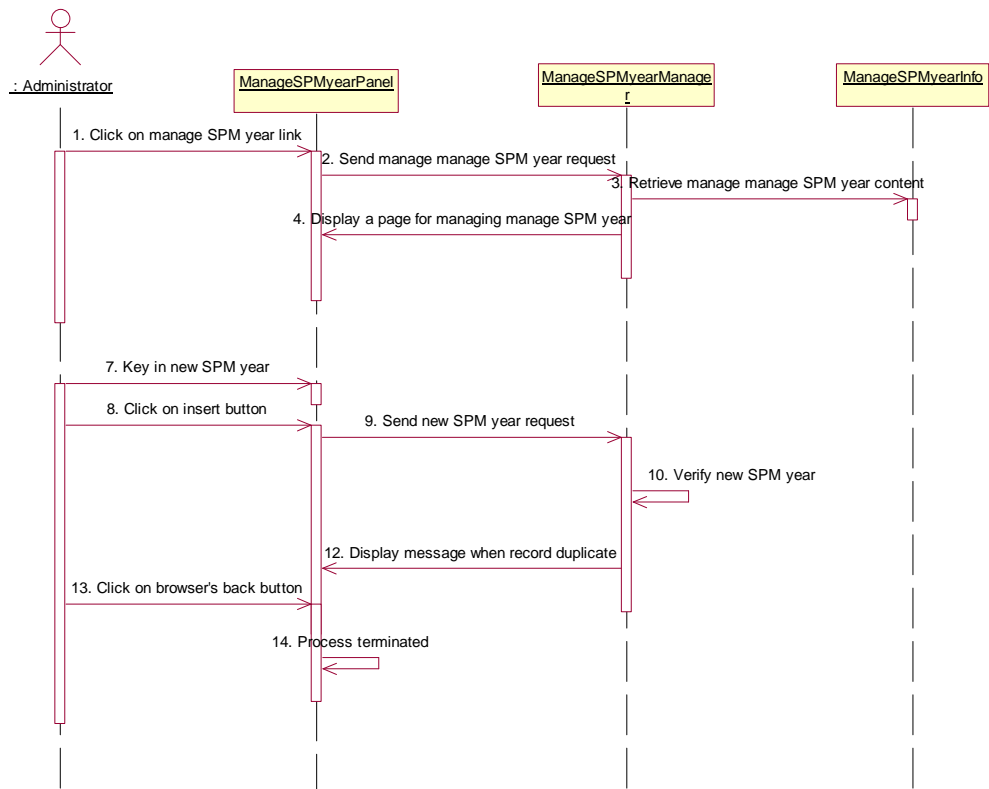
Manage SPM Year: [E2: Unable to Delete]   (SBAMS4ICT_13_05)
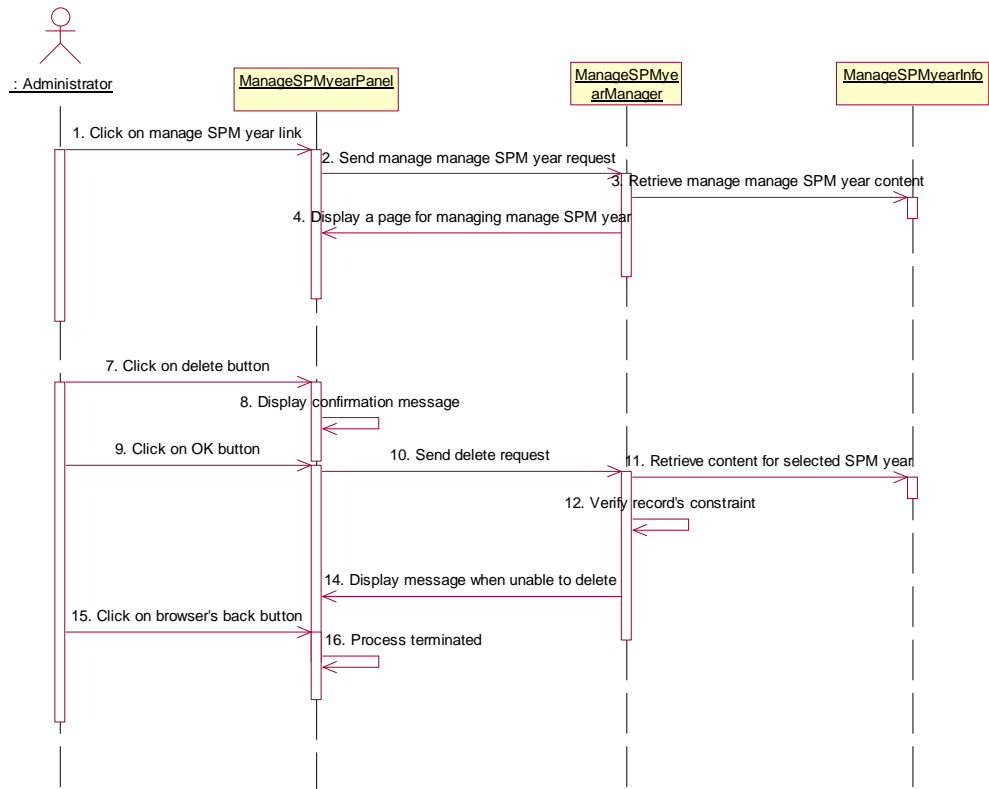
Logout: Basic Flow   (SBAMS4ICT_14_01)
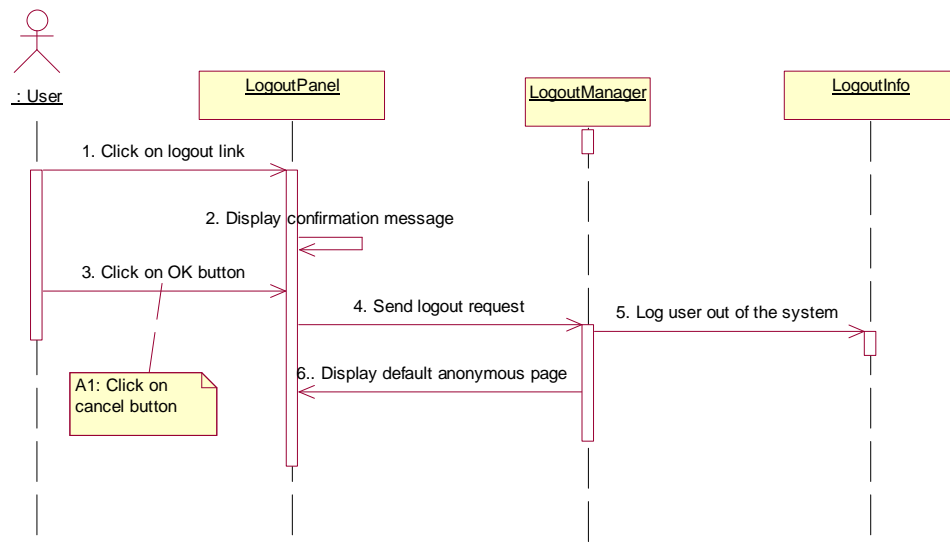
Logout: [A1: Press Cancel Button]   (SBAMS4ICT _14_02)

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Name	Description
aspnet_Applications	Used by ASP.NET features to provide an application scope for data.
aspnet_Membership	Used by the SQL Membership Provider to store membership data.
aspnet_Paths	Used by the SQL Personalization Provider to store the path for which Web Parts personalization state has been saved.
aspnet_PersonalizationAllUsers	Used by the SQL Personalization Provider to store shared personalization data.
aspnet_PersonalizationPerUser	Used by the SQL Personalization Provider to store per-user personalization data.
aspnet_Profile	Used by the SQL Profile Provider to store individual instances of property values.
aspnet_Roles	Used by the SQL Role Provider to store role data.
aspnet_Users	Used to store information regarding users, including user names and IDs.
aspnet_UsersInRoles	Used by the SQL Role Provider to map roles to users.
Student	Used to store detail about student and scores for every assessment aspect.
Form	Used to store form data.
School	Used to stored detail about school.
District	Used to store district data.
State	Used to store state data.
SpmYear	Used to store SPM year data.
UserProfiles	Used to store profile about user.

Table: aspnet_Applications
Description: Used by ASP.NET features to provide an application scope for data.
Columns

Name	Type	Description
ApplicationName	nvarchar(256)	Application name
LoweredApplication Name	nvarchar(256)	Application name (lowercase)
⚷ApplicationId	uniqueidentifier	Application ID
Description	nvarchar(256)	Application description

Table: aspnet_Membership
Description: Used by the SQL Membership Provider to store membership data.
Columns

Name	Type	Description
ApplicationId	uniqueidentifier	Application ID
⚷UserId	uniqueidentifier	User ID
Password	nvarchar(128)	Password (plaintext, hashed, or encrypted; base-64-encoded if hashed or encrypted)
PasswordFormat	int	Password format (0=Plaintext, 1=Hashed, 2=Encrypted)
PasswordSalt	nvarchar(128)	Randomly generated 128-bit value used to salt password hashes; stored in base-64-encoded form
MobilePIN	nvarchar(16)	User's mobile PIN (currently not used)
Email	nvarchar(256)	User's e-mail address
LoweredEmail	nvarchar(256)	User's e-mail address (lowercase)
PasswordQuestion	nvarchar(256)	Password question
PasswordAnswer	nvarchar(128)	Answer to password question
IsApproved	bit	1=Approved, 0=Not approved
IsLockedOut	bit	1=Locked out, 0=Not locked out
CreateDate	datetime	Date and time this account was created
LastLoginDate	datetime	Date and time of this user's last login
LastPasswordChangedDate	datetime	Date and time this user's password was last changed
LastLockoutDate	datetime	Date and time this user was last locked out
FailedPasswordAttemptCount	int	Number of consecutive failed login attempts
FailedPasswordAttemptWindowStart	datetime	Date and time of first failed login if FailedPasswordAttemptCount is nonzero
FailedPasswordAnswerAttemptCount	int	Number of consecutive failed password answer attempts
FailedPasswordAnswerAttemptWindowStart	datetime	Date and time of first failed password answer if FailedPasswordAnswerAttemptCount is nonzero
Comment	ntext	Additional text

Table: aspnet_Paths

Description: Used by the SQL Personalization Provider to store the path for which Web Parts personalization state has been saved.

Columns

Name	Type	Description
ApplicationId	uniqueidentifier	Application ID
⚷PathId	uniqueidentifier	Path ID
Path	nvarchar(256)	Path name
LoweredPath	nvarchar(256)	Path name (lowercase)

Table: aspnet_PersonalizationAllUsers

Description: Used by the SQL Personalization Provider to store shared personalization data.

Columns

Name	Type	Description
⚷PathId	uniqueidentifier	ID of the virtual path to which this state pertains
PageSettings	image	Serialized personalization state
LastUpdatedDate	datetime	Date and time state was saved

Table: aspnet_PersonalizationPerUser

Description: Used by the SQL Personalization Provider to store per-user personalization data.

Columns

Name	Type	Description
⚷Id	uniqueidentifier	ID of this record
PathId	uniqueidentifier	ID of the virtual path to which this state pertains
UserId	uniqueidentifier	ID of the user to which this state pertains
PageSettings	image	Serialized personalization state
LastUpdatedDate	datetime	Date and time state was saved

Table: aspnet_Profile

Description: Used by the SQL Profile Provider to store individual instances of property values.

Columns

Name	Type	Description
⚷UserId	uniqueidentifier	ID of the user to which this profile data pertains
PropertyNames	ntext	Names of all property values stored in this profile
PropertyValuesString	ntext	Values of properties that could be persisted as text
PropertyValuesBinar	image	Values of properties that were configured to

Name	Type	Description
y		use binary serialization
LastUpdatedDate	datetime	Date and time this profile was last updated

Table: aspnet_Roles
Description: Used by the SQL Role Provider to store role data.
Columns

Name	Type	Description
ApplicationId	uniqueidentifier	Application ID
⚷RoleId	uniqueidentifier	Role ID
RoleName	nvarchar(256)	Role name
LoweredRoleName	nvarchar(256)	Role name (lowercase)
Description	nvarchar(256)	Role description (currently unused)

Table: aspnet_Users
Description: Used to store information regarding users, including user names and IDs.
Columns

Name	Type	Description
ApplicationId	uniqueidentifier	Application ID
⚷UserId	uniqueidentifier	User ID
UserName	nvarchar(256)	User name
LoweredUserName	nvarchar(256)	User name (lowercase)
MobileAlias	nvarchar(16)	User's mobile alias (currently not used)
IsAnonymous	bit	1=Anonymous user, 0=Not an anonymous user
LastActivityDate	datetime	Date and time of last activity by this user

Table: aspnet_UsersInRoles
Description: Used by the SQL Role Provider to map roles to users.
Columns

Name	Type	Description
⚷UserId	uniqueidentifier	User ID
⚷RoleId	uniqueidentifier	Role ID

Table: Student
Description: Used to store detail about student and scores for every assessment aspect.
Columns

Name	Type	Description
⚷StudentMyKad	nvarchar(50)	Student's MyKad Number
StudentIndexNumber	nvarchar(50)	Student's Index Number
StudentName	nvarchar(50)	Student's Name

Name	Type	Description
Gender	nvarchar(50)	Student's Gender
SpmYear	nvarchar(50)	Student 's SPM Year
School	nvarchar(50)	Student's School Code
Form	nvarchar(50)	Student's Form
ClassName	nvarchar(50)	Student's Class Name
Email	nvarchar(50)	Student's Email
UserId	uniqueidentifier	User ID
S01_1_Construct	nvarchar(50)	Student's S01_1_Construct
S01_1_Aspect	nvarchar(50)	Student's S01_1_Aspect
S01_1	Integer	Student's S01_1 Score
S01_1_Date	Date	Student's S01_1_Date
S01_1_Remarks	nvarchar(50)	Student's S01_1_Remarks
S01_2_Construct	nvarchar(50)	Student's S01_2_Construct
S01_2_Aspect	nvarchar(50)	Student's S01_2_Aspect
S01_2	Integer	Student's S01_2 Score
S01_2_Date	Date	Student's S01_2_Date
S01_2_Remarks	nvarchar(50)	Student's S01_2_Remarks
S02_1_Construct	nvarchar(50)	Student's S02_1_Construct
S02_1_Aspect	nvarchar(50)	Student's S02_1_Aspect
S02_1	Integer	Student's S02_1 Score
S02_1_Date	Date	Student's S02_1_Date
S02_1_Remarks	nvarchar(50)	Student's S02_1_Remarks
Total_LA1	Computed column	((([S01_1]+[S01_2])+[S02_1])
S03_1_Construct	nvarchar(50)	Student's S03_1_Construct
S03_1_Aspect	nvarchar(50)	Student 's S03_1_Aspect
S03_1	Integer	Student's S03_1 Score
S03_1_Date	Date	Student's S03_1_Date
S03_1_Remarks	nvarchar(50)	Student's S03_1_Remarks
S04_1_Construct	nvarchar(50)	Student's S04_1_Construct
S04_1_Aspect	nvarchar(50)	Student's S04_1_Aspect
S04_1	Integer	Student's S04_1 Score
S04_1_Date	Date	Student's S04_1_Date
S04_1_Remarks	nvarchar(50)	Student's S04_1_Remarks
S05_1_Construct	nvarchar(50)	Student's S05_1_Construct
S05_1_Aspect	nvarchar(50)	Student's S05_1_Aspect
S05_1	Integer	Student's S05_1 Score

Name	Type	Description
S05_1_Date	Date	Student's S05_1_Date
S05_1_Remarks	nvarchar(50)	Student's S05_1_Remarks
Total_LA2	Computed column	(([S03_1]+[S04_1])+[S05_1])
S06_1_Construct	nvarchar(50)	Student's S06_1_Construct
S06_1_Aspect	nvarchar(50)	Student's S06_1_Aspect
S06_1	Integer	Student's S06_1 Score
S06_1_Date	Date	Student's S06_1_Date
S06_1_Remarks	nvarchar(50)	Student's S06_1_Remarks
S06_2_Construct	nvarchar(50)	Student's S06_2_Construct
S06_2_Aspect	nvarchar(50)	Student's S06_2_Aspect
S06_2	Integer	Student's S06_2 Score
S06_2_Date	Date	Student's S06_2_Date
S06_2_Remarks	nvarchar(50)	Student's S06_2_Remarks
S07_1_Construct	nvarchar(50)	Student's S07_1_Construct
S07_1_Aspect	nvarchar(50)	Student's S07_1_Aspect
S07_1	Integer	Student's S07_1 Score
S057_1_Date	Date	Student's S057_1_Date
S07_1_Remarks	nvarchar(50)	Student's S07_1_Remarks
Total_LA3	Computed column	(([S06_1]+[S06_2])+[S07_1])
S08_1_Construct	nvarchar(50)	Student's S08_1_Construct
S08_1_Aspect	nvarchar(50)	Student's S08_1_Aspect
S08_1	Integer	Student's S08_1 Score
S08_1_Date	Date	Student's S08_1_Date
S08_1_Remarks	nvarchar(50)	Student's S08_1_Remarks
S09_1_Construct	nvarchar(50)	Student's S09_1_Construct
S09_1_Aspect	nvarchar(50)	Student's S09_1_Aspect
S09_1	Integer	Student's S09_1Score
S09_1_Date	Date	Student's S09_1_Date
S09_1_Remarks	nvarchar(50)	Student's S09_1_Remarks
Total_LA4	Computed column	([S08_1]+[S09_1])
S10_1_Construct	nvarchar(50)	Student's S10_1_Construct
S10_1_Aspect	nvarchar(50)	Student's S10_1_Aspect
S10_1	Integer	Student's S10_1 Score
S10_1_Date	Date	Student's S10_1_Date
S10_1_Remarks	nvarchar(50)	Student's S10_1_Remarks
S11_1_Construct	nvarchar(50)	Student's S11_1_Construct

Name	Type	Description
S11_1_Aspect	nvarchar(50)	Student's S11_1_Aspect
S11_1	Integer	Student's S11_1 Score
S11_1_Date	Date	Student's S11_1_Date
S11_1_Remarks	nvarchar(50)	Student's S11_1_Remarks
Total_LA5	Computed column	([S10_1]+[S11_1])
S12_1_Construct	nvarchar(50)	Student's S12_1_Construct
S12_1_Aspect	nvarchar(50)	Student's S12_1_Aspect
S12_1	Integer	Student's S12_1 Score
S12_1_Date	Date	Student's S12_1_Date
S12_1_Remarks	nvarchar(50)	Student's S12_1_Remarks
S13_1_Construct	nvarchar(50)	Student's S13_1_Construct
S13_1_Aspect	nvarchar(50)	Student's S13_1_Aspect
S13_1	Integer	Student's S13_1 Score
S13_1_Date	Date	Student's S13_1_Date
S13_1_Remarks	nvarchar(50)	Student's S13_1_Remarks
Total_LA6	Computed column	([S12_1]+[S13_1])
Total	Computed column	(((((((((((((([S01_1]+[S01_2])+[S02_1])+[S03_1])+[S04_1])+[S05_1])+[S06_1])+[S06_2])+[S07_1])+[S08_1])+[S09_1])+[S10_1])+[S11_1])+[S12_1])+[S13_1])

Table: Form
Description: Used to store form data.
Columns

Name	Type	Description
🔑Form	nvarchar(50)	Form (Either 4 or 5)

Table: School
Description: Used to stored detail about school.
Columns

Name	Type	Description
🔑SchoolCode	nvarchar(50)	School Code
SchoolName	nvarchar(MAX)	School Name
CodeCenter	nvarchar(50)	Code Center
District	nvarchar(50)	School's District
State	nvarchar(50)	School's State

Table: District
Description: Used to store district data.
Columns

Name	Type	Description
🔑District	nvarchar(50)	District Name

Table: State
Description: Used to store state data.
Columns

Name	Type	Description
🔑State	nvarchar(50)	State Name

Table: SpmYear
Description: Used to store SPM year data.
Columns

Name	Type	Description
🔑SpmYear	nvarchar(50)	SPM Year

Table: UserProfile
Description: Used to store profile about user.
Columns

Name	Type	Description
🔑UserId	uniqueidentifier	User ID
FullName	nvarchar(50)	User's Full Name
PhoneNo	nvarchar(50)	User's Phone Number

Test Script for Administrator

No	Use Case	Requirement	Descriptions	Verified
1	Login System	SBAMS4ICT _02_01 Login	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on login button. • The system will log the user in the system and display the default page for registered user.	
		SBAMS4ICT _02_02 Click on home link	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on home link. • The page will redirect to anonymous default page.	
		SBAMS4ICT _02_03 Username, Password or Email Not Match	• The user providing a wrong username, password or/and email. • The system will display error message	
			•	
2	Search record	SBAMS4ICT _07_01 Search assessor	• The administrator click on search option link on system menu. • The system will display a search category page. • The administrator will click on assessor button to search record for registered assessors' record. • The system will display a search option page for assessor. • The administrator will select the search by option. • The administrator will enter an appropriate search keyword. • The administrator will click on search button. • The system will display a search result based on search by option.	
		SBAMS4ICT _07_02 Search student	• The administrator will click on student button to search record for registered students' record. • The system will display a search option page for student. • The administrator will select the search by option. • The administrator will enter an appropriate search keyword. • The administrator will click on search button. • The system will display a search result based on search by option.	
		SBAMS4ICT _07_03 Click on Back Button	• The assessor will click on back button. • The system will return to a previous page.	

3	Reassign Student	SBAMS4ICT _07_04 No Record Found	• The system will display a message whenever no record found for the search by option and keyword.	
		SBAMS4ICT _08_01 Reassign student	• The administrator click on transfer student link on system menu. • The system will display a reassign student page. • The administrator will select a state from drop down menu. • The administrator will select student's previous school name from a drop down menu. • The system will display a list of combination result. • The administrator will click on edit link on intended student. • The system will display an editable field for the selected student. • The administrator will assign new assessor by changing the previous assessor ID to new assessor ID. • The administrator will click on update link. • The system will update the student and assessor assignment. • The system will display the updated list of student and assessor assignment.	
		SBAMS4ICT _08_02 Click on Cancel Link	• The assessor click on cancel button. • The system will terminate the process.	
		SBAMS4ICT _08_03 No Record Found	• The system will display a message whenever no record found for the state and school combination.	
4	Manage User	SBAMS4ICT _09_01 Manage user's detail	• The administrator click on manage user link on system menu. • The system will display a page for users' record management option. • The administrator will click on details button to manage registered users' details. • The system will display a page for users' details management. • The administrator will click on edit button. • The system will display an editable field for the selected user. • The administrator will implement the editing on selected school's record. • The administrator will click on update button. • The system will save the user's record. • The system will display the updated records.	

		SBAMS4ICT _09_02 Manage user's status	• The administrator will click on status button. • The system will display a page for users' status management. • The administrator will click on manage link • The system will display a page for updating user's status • The administrator will update approved option. • The system will update the approved status for the selected user. • The system will display the update message.	
		SBAMS4ICT _09_03 Manage user's role	• The administrator will click on roles button. • The system will display a page for users' roles management. • The administrator will update users' roles. • The system will update the roles for the selected user. • The system will display the updated users' roles record.	
		SBAMS4ICT _09_04 Click on Delete Button	• The administrator will click on delete button. • The system will display a confirmation message. • The administrator click on OK button. • The system will delete the record of the selected user. • The system will display an updated list of registered users.	
		SBAMS4ICT _09_05 Click on Cancel Button	• The administrator click on cancel button. • 2.The system will terminate the process	
		(SBAMS4ICT _09_06 Click on Unlock User Button	• The administrator will click on unlock user button. • The system will update the unlock status of the user.	
		SBAMS4ICT _09_07 Click on Back Button	• The administrator will click on back button. • The system will return to a previous page.	
		SBAMS4ICT _09_08 Unable to Delete	• The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint. • The administrator click on browser's back button.	
5	Manage Role	SBAMS4ICT _10_01 Manage role	• The administrator click on manage role link on system menu. • The system will display a manage role page. • The administrator will key in new role name into provided field. • The administrator will click on create role button. • The system will create the new role. • The system will display the updated list of registered roles.	

		SBAMS4ICT _10_02 Click on Delete Role Button	• The administrator click on delete role button to delete intended role. • The confirmation on deletion will be displayed. • The administrator click on OK button. • The system will delete the selected record.	
		SBAMS4ICT _10_03 Click on Cancel Button	• The assessor click on cancel button. • The system will terminate the process.	
		SBAMS4ICT _10_04 Role Already Exist	• The system will display an error message mentioning role already exist. • The system will terminate the process.	
6	Manage School	SBAMS4ICT _11_01 Manage registered school record	• The administrator click on manage school link on system menu. • The system will display a page for a school record management option. • The administrator will click on manage button to manage registered school's record. • The system will display a drop down menu for selecting a state for registered school. • The administrator will select the state. • The system will display a list of registered schools for the selected state. • The administrator will click on edit button. • The system will display an editable field for the selected school. • The administrator will implement the editing on selected school's record. • The administrator will click on update button. • The system will save the fresh record of the selected school. • The system will display the updated school record.	
		SBAMS4ICT _11_02 Click on Add Button	• The administrator will click on add button. • The system will display a form for adding new school's record. • The assessor will fills in the required field. • The administrator will click on add school button. • The system will save new school's record.	
		SBAMS4ICT _11_03 Click on Back Button	• The administrator will click on back button. • The system will return to a previous page.	
		SBAMS4ICT _11_04 Click on Delete Button	• The administrator will click on delete button. • The system will display a confirmation message. • The administrator click on OK button. • The system will delete the record of the selected school. • The system will display an updated list of registered schools.	

		(SBAMS4ICT _11_05 Click on Cancel Button	• The administrator click on cancel button. • The system will terminate the process	
		SBAMS4ICT _11_06 No Record Found	• The system will display a message whenever no school record found for the selected state.	
		SBAMS4ICT _11_07 Blank Field	• Administrator needs to fill in every single field in school registration page.	
		SBAMS4ICT _11_08 Duplicate Record	• The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY. • The assessor click on browser's back button. • The system will terminate the process.	
		SBAMS4ICT _11_09 Unable to Delete	• The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint. • The administrator click on browser's back button. • The system will terminate the process.	
7	Manage District and State	SBAMS4ICT _12_01 Manage registered district	• The administrator click on district | state link on system menu. • The system will display a management option for district and state record. • The administrator will click on district button to manage district's record. • The system will display a manage district page. • The administrator will key in new district record into provided field. • The administrator will click on insert button. • The system will save new district record. • The system will display the updated list of registered district.	
		SBAMS4ICT _12_02 Manage registered state	• The administrator will click on state button to manage state's record. • The system will display manage state page. • The administrator will key in new state record into provided field. • The administrator will click on insert button. • The system will save new state record. • The system will display the updated list of registered state.	
		SBAMS4ICT _12_03 Click on Back Button	• The assessor will click on back button. • The system will return to a previous page.	

		SBAMS4ICT _12_04 Click on Delete District Button	• The administrator click on delete button to delete intended district. • The confirmation on deletion will be displayed. • The administrator click on OK button. • The system will delete the selected record.	
		SBAMS4ICT _12_05 Click on Cancel Button	• The assessor click on cancel button. • The system will terminate the process.	
		SBAMS4ICT _12_06 Click on Delete State Button	• The administrator click on delete button to delete intended state. • The confirmation on deletion will be displayed. • The administrator click on OK button. • The system will delete the selected record.	
		SBAMS4ICT _12_07 Duplicate Record	• The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY. • The assessor click on browser's back button. • The system will terminate the process.	
		SBAMS4ICT _12_08 Unable to Delete	• The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint. • The administrator click on browser's back button. • The system will terminate the process.	
8	Manage SPM Year	SBAMS4ICT _13_01 Manage SPM Year	• The administrator click on manage SPM year link on system menu. • The system will display a manage SPM year page. • The administrator will key in new SPM year record into provided field. • The administrator will click on insert button. • The system will save new SPM year record. • The system will display the updated list of registered SPM year.	
		SBAMS4ICT _13_ 02 Click on Delete Button	• The administrator click on delete button to delete intended SPM year. • The confirmation on deletion will be displayed. • The administrator click on OK button. • The system will delete the selected record.	
		SBAMS4ICT _13_03 Click on Cancel Button	• The assessor click on cancel button. • The system will terminate the process.	
		SBAMS4ICT _13_04 Duplicate Record	• The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY. • The assessor click on browser's back button. • The system will terminate the process.	

		SBAMS4ICT _13_05 Unable to Delete	• The system will display a message whenever the record is unable to be deleted. This occurred because The DELETE statement conflicted with the REFERENCE constraint. • The administrator click on browser's back button. • The system will terminate the process.	
9	Logout	SBAMS4ICT _14_01 Logout	• This use case begins when the administrator click on logout link from the system menu. • The system will display the confirmation message. • The administrator will press OK button. • The system will log off the administrator. • The system will be redirected to the system homepage.	
		SBAMS4ICT _14_02 Click on Cancel Button	• The administrator press cancel button. • The system will terminate the process	

Test Script for School Admin

No	Use Case	Requirement	Descriptions	Verified
1	Login System	SBAMS4ICT _02_01 Login	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on login button. • The system will log the user in the system and display the default page for registered user.	
		SBAMS4ICT _02_02 Click on home link	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on home link. • The page will redirect to anonymous default page.	
		SBAMS4ICT _02_03 Username, Password or Email Not Match	• The user providing a wrong username, password or/and email. • The system will display error message	
			•	
2	View Progress	SBAMS4ICT _06_01 View progress	• The school admin click on view progress link on system menu. • The system will display a student's progress record for earliest registered year for the coursework assessment progress. • The school admin will click on select button for intended student. • The system will display a detail personal progress record for the selected student • The school admin will click on back button. • The system will return to a previous page.	
		SBAMS4ICT _06_02 Change the SPM Year	• The school admin change the SPM year option from drop down menu. • The system will display a student's progress record for the selected SPM year	
		SBAMS4ICT _06_03 Click on Print Button	• The school admin will click on print button. • The printing process will start.	
3	Logout	SBAMS4ICT _14_01 Logout	• This use case begins when the school admin click on logout link from the system menu. • The system will display the confirmation message. • The school admin will press OK button. • The system will log off the school admin. • The system will be redirected to the system homepage.	
		SBAMS4ICT _14_02 Click on Cancel Button	• The school admin press cancel button. • The system will terminate the process	

Test Script for Assessor

No	Use Case	Requirement	Descriptions	Verified
1	Registration	SBAMS4ICT_01_01 Register new account	• The user click on registration link on the system homepage. • The system will display a registration form. • The user will fill in the details on the first part of registration form (username, password, confirm password, email, security question, security answer) • The user will click on create user button. • The user will fill in the details on the second part of registration form (full name and phone number). • The user will click on Next button. • The system will display a message on successfully created account. • The user will click on Continue button. • The system will log the user into the system and prompting a user's default page.	
		SBAMS4ICT_01_02 Click on home link	• The user click on registration link on the system homepage. • The system will display a registration form. • The user will fill in the details on the first part of registration form (username, password, confirm password, email, security question, security answer) • The user will click on home link. • The page will redirect to anonymous default page.	
		SBAMS4ICT_01_03 Blank field	• The user fails to fill all required field. • The user click on create user button. • The system alerting user about blank field.	
		SBAMS4ICT_01_04 Username already in use	• The user chooses username which already in use. • The user click on create user button. • The system will display error message.	
		SBAMS4ICT_01_05 Password and confirm password not match	• The user enters a different content for password and confirm password. • The user click on create user button. • The system will display error message	
		SBAMS4ICT_01_06 Email already in use	• The user chooses email which already in use. • The user click on create user button. • The system will display error message.	
2	Login System	SBAMS4ICT_02_01 Login	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on login button.	

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			• The system will log the user in the system and display the default page for registered user.	
		SBAMS4ICT _02_02 Click on home link	• The user click on the login link. • The system will display a login form. • The user will key in their username, password and email. • The user will click on home link. • The page will redirect to anonymous default page.	
		SBAMS4ICT _02_03 Username, Password or Email Not Match	• The user providing a wrong username, password or/and email. • The system will display error message	
			•	
3	**Manage Student**	SBAMS4ICT _03_01 Manage registered student	• The assessor click on manage student link on system menu. • The system will display a management option for student record. • The assessor will click on manage button to manage registered student's record. • The system will display a drop down menu for selecting student's SPM year. • The assessor will select the SPM year. • The system will display a list of registered students for the selected SPM year. • The assessor will click on edit button. • The system will display an editable field for the selected student. • The assessor will implement the editing on selected student's record. • The assessor will click on update button. • The system will save the record of the selected student. • The system will display the updated list of registered student for the selected SPM year.	
		SBAMS4ICT _03_02 Add new student record	• The assessor click on manage student link on system menu. • The system will display a management option for student record. • The assessor will click on add button. • The system will display a form for adding new student's record. • The assessor will fills in the required field. • The assessor will click on add student button. • The system will save new student's record.	
		SBAMS4ICT _03_03 Click on back button	• The assessor will click on back button. • The system will return to a previous page.	

		SBAMS4ICT _03_04 Click on delete button	- The assessor will click on delete button. - The system will display a confirmation message. - The assessor click on OK button. - The system will delete the record for the selected student. - The system will display a fresh record of student for selected SPM year.	
		SBAMS4ICT _03_05 Click on cancel button	- The assessor click on cancel button. - The system will terminate the process.	
		SBAMS4ICT _03_06 No Record Found	The system will display a message whenever no record found for the selected SPM year.	
		SBAMS4ICT _03_07 Duplicate Record	- The system will display a message whenever the record entered is duplication of registered record. This is because of the violation of PRIMARY KEY. - The assessor click on browser's back button. - The system will terminate the process.	
		SBAMS4ICT _03_08 Blank Field	User needs to fill in every single field in student's registration page.	
4	Manage Score	SBAMS4ICT _04_01 Manage score	- The assessor click on manage score link on system menu. - The system will display a manage score page with a drop down menu for student's SPM year. - The assessor select the SPM year. - The system will display a list of registered students for the selected year. - The assessor will click on select button for intended student. - The system will display a score detail for selected student. - The assessor will be able to update score, date and remark for the selected student. - The assessor click on update button. - The system will update the score detail for the selected student. - The assessor click on done button. - The system will return to the list of registered students for the selected year.	
		SBAMS4ICT _04_02 Click on Cancel Button	- The assessor click on cancel button. - The system will terminate the process.	
		SBAMS4ICT _04_03 Click on Email Button	- The assessor will click on email button. - The system will send the email to selected student and prompt a message to inform that the email has been sent. - The assessor will click on OK button.	

		SBAMS4ICT_04_04 No Record Found	• The system will display a message whenever no record found for the selected SPM year.	
5	**Print Document**	SBAMS4ICT_05_01 Print ISF	• The assessor click on print option link on system menu. • The system will display a list of document type. • The assessor click on ISF button. • The system will display a drop down menu for selecting student's SPM year. • The assessor select the SPM year. • The system will display a list of registered students for the selected year. • The assessor click on select button for intended student. • The system will display an ISF record for the selected student. • The assessor will click on print ISF button. • The printing process will start.	
		SBAMS4ICT_05_02 Print BSF	• The assessor will click on BSF button. • The system will display a drop down menu for selecting student's SPM year. • The assessor select the SPM year. • The system will display a BSF record for the selected year. • The assessor will click on print BSF button. • The printing process will start.	
		SBAMS4ICT_05_03 Print ROS	• The assessor will click on ROS button. • The system will display a drop down menu for selecting student's SPM year. • The assessor select the SPM year. • The system will display a list of registered students for the selected year. • The assessor click on select button for intended student. • The system will display an ROS record for the selected student. • The assessor will click on print ROS button. • The printing process will start.	
		SBAMS4ICT_05_04 Print CWP	• The assessor will click on CWP button. • The system will display a drop down menu for selecting student's SPM year. • The assessor select the SPM year. • The system will display a list of registered students for the selected year. • The assessor click on select button for intended student. • The system will display an CWP record for the selected student. • The assessor will click on print CWP button. • The printing process will start.	

		SBAMS4ICT _05_05 Click on Back Button	• The assessor will click on back button. • The system will return to a previous page.	
		SBAMS4ICT _05_06 No Record Found	• The system will display a message whenever no record found for the selected SPM year.	
6	Logout	SBAMS4ICT _14_01 Logout	• This use case begins when the assessor click on logout link from the system menu. • The system will display the confirmation message. • The assessor will press OK button. • The system will log off the assessor. • The system will be redirected to the system homepage.	
		SBAMS4ICT _14_02 Click on Cancel Button	• The assessor press cancel button. • The system will terminate the process	

Appendix 10: Examples of Printed Document s form the System

ISF

LEMBAGA PEPERIKSAAN MALAYSIA
KEMENTERIAN PELAJARAN MALAYSIA

INDIVIDUAL SCORE FORM

INFORMATION AND COMMUNICATION TECHNOLOGY

YEAR   2012

Name of Candidate	IMAN NUR HAKIM BIN MOHD FAZUDLI
Identity Card Number	080425020035
Index Number	KH001K001

CODE	ASPECT	SCORE	REMARKS
LA1.S01.1	Apply correct security procedures using antivirus	2	
LA1.S01.2	Apply correct security procedures using anti-spyware	2	
LA1.S02.1	Locate and present information on impact of ICT and society	2	
LA1.S03.1	Assemble the components of a PC correctly	2	
LA1.S04.1	Install operating system, application software and utility programs	2	
LA1.S05.1	Explain the latest open source software available and the latest development in ICT	2	
LA1.S06.1	Crimp and test UTP cable	2	
LA1.S06.2	Configure and test network connection	2	
LA1.S07.1	Explain the latest development in networks and communications	2	
LA1.S08.1	Apply all the phases of multimedia production to produce an interactive educational multimedia project	2	
LA1.S09.1	Gather examples of immersive multimedia in education, business or entertainment	2	
LA1.S10.1	Apply program development phases to develop a problem-solving program	2	
LA1.S11.1	Find out the latest programming languages	2	
LA1.S12.1	Develop a database project	2	
LA1.S13.1	Find out current developments in computer information systems	2	
	TOTAL SCORE	30	

Assessor's Signature	Internal Verifier's Signature	External Verifier's Signature
Name :	Name :	Name :
Date :	Date :	Date :

BSF

bsf

LEMBAGA PEPERIKSAAN MALAYSIA
KEMENTERIAN PELAJARAN MALAYSIA
BATCH SCORE FORM
INFORMATION AND COMMUNICATION TECHNOLOGY

CENTER CODE : KJ101-1   SCHOOL CODE : KEE9023   YEAR : 2013

Index Number	Identity Card Number	Name	LA1	LA2	LA3	LA4	LA5	LA6	Score
df4wwe	123456	cdsgfdvd	0	0	0	0	0	0	0
KF00BF561	9601260277890	SHARIFAH NUR BINTI SYED NORA	4	1	0	0	0	0	5
KH001K0G2	1103030200576	IRDINA NUR HAFIYA BINTI MOHD FAZUDLI	6	6	6	4	4	4	30
KH001K0U6	990909	ABDUL RAHIM BIN BACHICK	3	0	0	0	0	0	3
KJD01K099	89-8	AZNIL BIN HAJI NAWAWEL	2	0	0	0	0	0	2
KJ001K764	070656098766	WARDINA SAFFIYAH BINTI WAK PARJOO	6	6	6	0	0	0	18
KJ00BK654	960908090769	ISTAFA BIN ALI	4	0	0	0	0	0	4
KJD09K765	960708095412	ZAKIAH BINTI ANAZ	4	0	0	2	0	0	6

Assessor's Declaration

This is to certify that the ICT coursework scores have been awarded in accordance with the requirements of the syllabus and that every reasonable step has been taken to ensure that the work presented is the candidate's own work.

Assessor's Signature

Name :
Date :

Internal Verifier's Declaration

I confirm that the assessor's declaration above is true

Internal Verifier's Signature

Name :
Date :
School's Official Stamp

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ICT Assessment (3765/2)   http://localhost:5060/ICT/Assessor/AssessorPrintROS.aspx

LEMBAGA PEPERIKSAAN MALAYSIA
KEMENTERIAN PELAJARAN MALAYSIA
INDIVIDUAL SCORE FORM
INFORMATION AND COMMUNICATION TECHNOLOGY
YEAR 2012

RECORD OF SUBMISSION

Name of Candidate	IMAN NUR HAKIM BIN MOHD FAZUDLI
Identity Card Number	080425020035
Index Number	KH001K001

Date of Submission / Assessment	Construct Code	Aspect Code	Signature		Remarks
			Candidate	Assessor	
20-Jan-2011	S01	LA1.S01.1			
17-Feb-2011	S01	LA1.S01.2			
25-Mar-2011	S02	LA1.S02.1			
10-Apr-2012	S03	LA2.S03.1			
12-May-2011	S04	LA2.S04.1			
24-Jun-2011	S05	LA2.S05.1			
14-Jul-2010	S06	LA3.S06.1			
10-Aug-2011	S06	LA3.S06.2			
11-Sep-2011	S07	LA3.S07.1			
18-Oct-2011	S08	LA4.S08.1			
05-Nov-2011	S06	LA4.S09.1			
08-Jan-2012	S10	LA5.S10.1			
10-Jan-2012	S11	LA5.S11.1			
12-Jan-2012	S12	LA6.S12.1			
23-Jan-2012	S13	LA6.S13.1			

LEMBAGA PEPERIKSAAN MALAYSIA
KEMENTERIAN PELAJARAN MALAYSIA

INFORMATION AND COMMUNICATION TECHNOLOGY
3765/2

SIJIL PELAJARAN MALAYSIA
YEAR 2013

COURSEWORK PORTFOLIO

Name of School	SMK GUAR CHEMPEDAK
Name of Candidate	IRDINA NUR HAFIYA BINTI MOHD FAZUDLI
Identity Card Number	110303020576
Index Number	KH001K002

Admin viewing individual progress

SMK GUAR CHEMPEDAK
INDIVIDUAL SCORE DETAILS
INFORMATION AND COMMUNICATION TECHNOLOGY
(3765/2)

YEAR **2012**

Name of Candidate	SULAIMAN BIN HAMZAH
Identity Card Number	090908120987
Index Number	KJ009K908
Form	5
Class	5S1
Email	sulaiman@gmail.com
Teacher (Assessor)	MOHD FAZUDLI BIN SAAD

CODE	ASPECT	SCORE	REMARKS
LA1.S01.1	Apply correct security procedures using antivirus	2	
LA1.S01.2	Apply correct security procedures using anti-spyware	2	
LA1.S02.1	Locate and present information on impact of ICT and society	2	
LA1.S03.1	Assemble the components of a PC correctly	0	
LA1.S04.1	Install operating system, application software and utility programs	0	
LA1.S05.1	Explain the latest open source software available and the latest development in ICT	0	
LA1.S06.1	Crimp and test UTP cable	0	
LA1.S06.2	Configure and test network connection	0	
LA1.S07.1	Explain the latest development in networks and communications	0	
LA1.S08.1	Apply all the phases of multimedia production to produce an interactive educational multimedia project	0	
LA1.S09.1	Gather examples of immersive multimedia in education, business or entertainment	0	
LA1.S10.1	Apply program development phases to develop a problem-solving program	0	
LA1.S11.1	Find out the latest programming languages	0	
LA1.S12.1	Develop a database project	0	
LA1.S13.1	Find out current developments in computer information systems	0	
	TOTAL SCORE	6	

SCHOOL BASED ASSESSMENT MANAGEMENT SYSTEM FOR ICT SUBJECT

I'm Mohd Fazudli bin Saad and currently doing my master degree in Master of Science (Information Technology) in Universiti Utara Malaysia. As the requirement to full fill the study, I'm doing a thesis regarding the development of management system assisting school assessor managing students' assessment records. The management system is purposely for ICT subject in school.

It's a great honor if you could provide a feedback and evaluate the developed prototype of the School Based Assessment Management System for ICT Subject.

Thank you.

Section A: Demographic

Please tick (√) on appropriate selection.

1. **Gender** : ☐ Male

   ☐ Female

2. **Educational Level** : ☐ Diploma *Major in* ……………………………………………………………………

   ☐ Degree *Major in* ……………………………………………………………………

   ☐ Master Degree *Major in* ……………………………………………………………………

   ☐ Phd *Major in* ……………………………………………………………………

3. **Working Experience** : ☐ < 5 years

   ☐ 5 to 10 years

   ☐ > 10 years

4. **Teaching ICT Subject** : ☐ < 3 years

   ☐ > 3 years

Perceived Usefulness and Ease of Use

Based on: Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13:3, 319-340.

Please rate the usefulness and ease of use of the system.
- Try to respond to all the items.
- For items that are not applicable, use: **NA**

System:

SCHOOL BASED ASSESSMENT MANAGEMENT SYSTEM FOR ICT SUBJECT

	PERCEIVED USEFULNESS		1	2	3	4	5	6	7		NA
1	Using the system in my job would enable me to accomplish tasks more quickly	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
2	Using the system would improve my job performance	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
3	Using the system in my job would increase my productivity	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
4	Using the system would enhance my effectiveness on the job	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
5	Using the system would make it easier to do my job	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
6	I would find the system useful in my job	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐

	PERCEIVED EASE OF USE		1	2	3	4	5	6	7		NA
7	Learning to operate the system would be easy for me	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
8	I would find it easy to get the system to do what I want it to do	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
9	My interaction with the system would be clear and understandable	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
10	I would find the system to be flexible to interact with	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
11	It would be easy for me to become skillful at using the system	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐
12	I would find the system easy to use	*unlikely*	☐	☐	☐	☐	☐	☐	☐	*likely*	☐

List the most **negative** aspect(s):

1.	
2.	
3.	

List the most **positive** aspect(s):

1.	
2.	
3.	