

Jordan University of Science and Technology Faculty of Computer and Information Technology Department of Software Engineering SE440 – Projects Management

Online School Management System

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Introduction

OVERVIEW

United Nations Educational, Scientific and Cultural Organization (UNESCO, 2001) argues that education gives power to people: becoming more proactive and gain control over their lives. Basic education is one of the keys to empowerment, both for individuals and groups. It is the primary vehicle by which economically and socially marginalized adults and children can lift themselves out of poverty and obtain the means to participate fully in their communities.

Usually systems are built for improvements and solving particular problems that organizations face. Schools are one of the most important organizations that build up a well-developed and strong community in the world. Even though they're very reliable systems they still lack convenience, organization and modernization which cannot be done manually. Therefore, the idea of an electronic system has been introduced.

Information and Communications Technology (ICT) have been integrated in education in many developing and developed countries alike, In Jordan most schools have computer labs and the level of exposure to PCs and smartphones for the young ones is as high, with most being Internet connected, but the use of ICT in Jordanian schools is still lagging behind, the problem lies in how we are using all those resources. In a managerial perspective it is but nonsense to have that much ratio to actual usage.

The use of IS provides innovative ways to complement the traditional student-teacher interactions, to optimize resource usage, sharing, collaboration, improve the performance of students as well as raising morale for teachers and students. Therefore, the development of OSMS has high priority and hence relevance.

1.1 Purpose

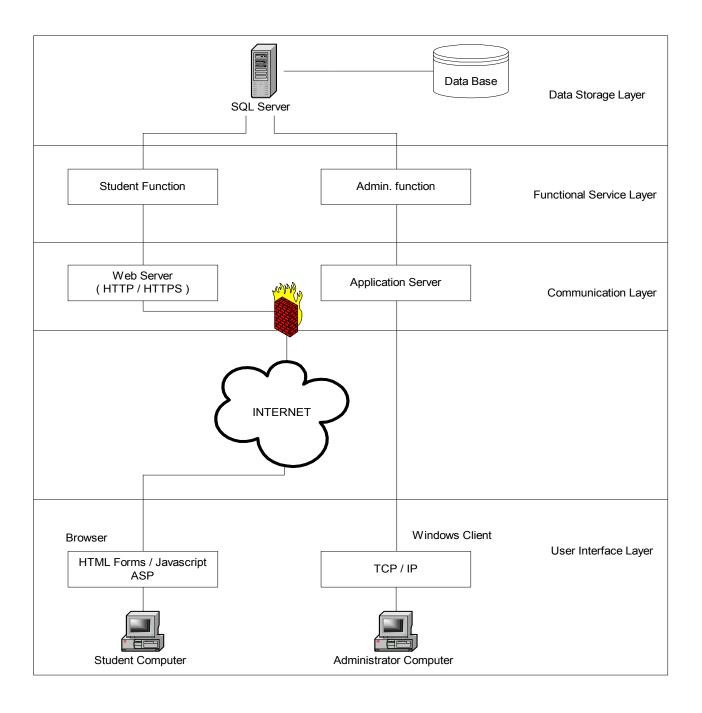
To create robust online system capable to make all the process in the school easier and reduce the amount of the work which assigned to the staffs.

1.2 Scope

The system organizes the processes done in any typical school electronically. It is a web based service that helps in managing the schools' system.

For example, this system introduces the process of registering students, uploading student's marks, accessing schedules, students and employees' attendance.

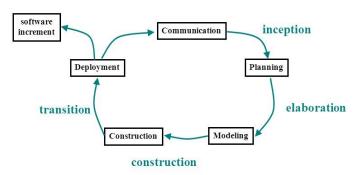
1.3 Architecture Diagram



1.4 Methodology used -SDLC- from initiation to implementation

Rational Unified Process provides a disciplined approach to assigning tasks and responsibilities within a development organization. Its goal is to ensure the production of high-quality software that meets the needs of its end-users, within a predictable schedule and budget, this process environment provides a central, common process definition that all software development team members can share, helping to ensure clear and unambiguous communication between team members.

Unified process



- Incremental, iterative
- "Unified" → same originators as UML
- Also called Rational Unified Process (RUP)
- Based on spiral model, developed at Rational Software, a division of IBM since 2003

This helps you to play the part expected of

you in the project team by making it clear what your responsibilities are. As a general software engineering reference, RUP provides a wealth of guidance on software development practices.

Why RUP?

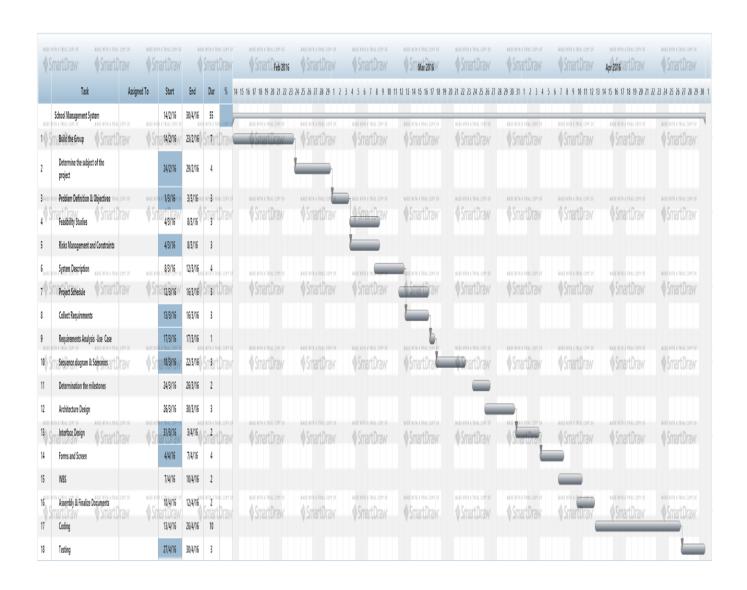
At its heart, RUP is a collected body of software engineering practices that are continually improved on a regular basis to reflect changes in industry practices. In other words, it is the most flexible model available for building any type of software system and can scale from small to large and complex projects.

For our project "School System" this is the best approach to be taken for many reasons including:

- 1- Diverse team members.
- 2- Weekly time invested by each member is not well defined.
- 3- System scope can vary depending on arrival of new researched material on such systems.
- 4- Set points of each iteration well be defined.
- 5- Team management is not set on one person but rather by the whole team.

6-

1.5 Gantt Chart



1.6 Glossary

OSMS	Online School Management System	
SOW	Statement of work	
WBS	work breakdown schedule	

Planning phase

2.1 <u>Feasibility Studies</u>

2.1.1 Technical Feasibility

In our project, we need some of web development language such that: PHP, HTML and JavaScript, part of the group members' professional in these language and most of them learn these languages in many courses during the undergraduate studies. In addition to this we need some of software development and design skills such that: all of diagrams types like: Use case Diagram, Class Diagram, Sequence Diagram and etc. and all of group members know most of these skills, So it could be the work of the project in terms of technology.

The technologies to be used are:

- HTML, CSS and JavaScript browser scripting language for interactivity.
- PHP server scripting language.
- MySQL database engine.
- Extensible Mark-up Language (XML) for data description, structure, store and interoperability.

2.1.2 Scheduling Feasibility

This project could require up to almost two months. After calculate the time available to us during the semester and calculate the time required for each stage of the project, we can continue with this project and complete each stage in its available time and consideration extra time for each stage in order to avoid any expected delay in an emergency cases may happen during work on the project

2.1.3 Operational Feasibility

- -This system will change the process of school management in a school from traditional paper system to a computerized and faster system.
- -This system will help teachers, students and all school staff to accomplish their jobs easily and from anywhere.
- -Using the system is easy and anyone can learn how to use it in short time because of this system has friendly interface.
- -This system suitable for most of schools and, but we must keep in mind that these schools remain in touch with the designers to keep up with any amendments and additions to the system.

2.2 Risks

- 1. The lack of experience of some programming languages, team members would like to learn.
- 2. Possible in some schools there is not sufficient computers.
- 3. Users don't understand the software engineering process
- 4. technology is new for users
- 5. System could be hacked easily
- 6. Lack of time management which might lead to a delay of the submission
- 7. Some of team members may misunderstand the requirements, which will lead to wrong work which is a waste of time
- 8. When testing the code, the system might break down

Analysis phase

3.1 <u>Techniques used to collect requirements</u>

• - Interview

Open-ended interview questionnaires were used to interview selected schools' stakeholders (administrators, students and teachers).

• - Existing Documents

Going through existing relevant documents including searched documents from the Internet related to educational information system software.

• - Brainstorming.

3.2 Problem Analysis, Statement and Planning

CURRENT SYSTEM (Analysis & Statement)

The current system "EduWave" is lacking in many regards, for example if we look at the following screenshots of the actual system as seen by a teacher's role:



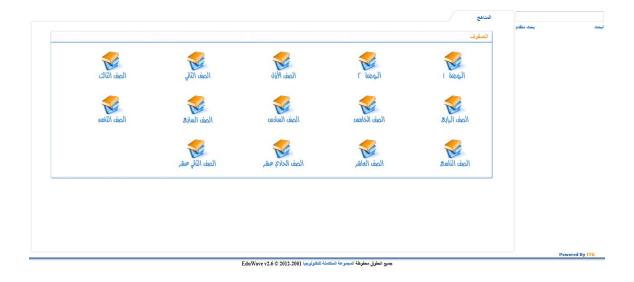
The above picture shows the user info page (teacher role) with many problems naming only two obvious ones: 1. Missing information such as, type of courses this teacher gives. 2. The layout is all over the place i.e. it's a nightmare in UI/UX design perspective: huge gaps, unaligned members of the same type and level...



The above one shows the real problem of the system, the need for manual consistency checks between dependent modules that are implemented in a way as if they are independent, here it needs the courses module to construct the schedule, yet they are made independent modules with manual labor that isn't being made by the school admin, and no one would blame him if he has to keep doing it manually across many classrooms, each serving up to 7 courses a day, with other out of class activities and sports/art sessions, if any, for many teachers.



As for the above picture, three words needed to explain the dire situation, empty electronic library.

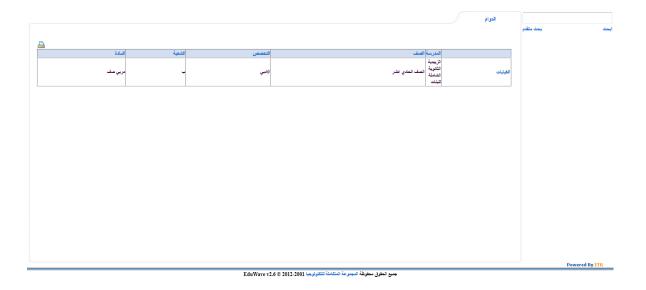




Above two pictures show, the list of all basic education books and material by level (year) as seen in picture 1. After navigating to a certain material you are always ending up with the same empty page with different titles only, as seen in picture 2, which is a problem in the Data Base (DB) side of the system and/or DB connector.



In the above picture we clearly see the limitations of the current system and its functionality in regards to event management, even the title of the page is clearly of context, not to mention the missing details (what is the event about, date, place...).









All of the four pictures above show the most used features of the current system for a teacher, yet the design and overall hierarchy of elements promotes errors and repetition of steps at its finest, for a starter, it uses simple one pattern tables with no row spacing, secondly, a teacher has to click on each functionality before class selection, so if he intends to do multiple changes for a certain student -or more- on many different functionalities he has to go back and forth between up to 5 levels of menus, such architecture is not good at all.

As for the system's largest number of users -namely students-, it turned out to be much worse as they use it only for one reason and that is, viewing their grades!

So, what is happening? The usage of the current system is too low because of its limited functionality, bad design and troubling technology implementation (flash – see https://en.wikipedia.org/wiki/Adobe Flash#Criticisms for more info).

Nowadays education plays a great role in the development of countries. Many educational organizations try to increase the efficiency and effectiveness of education. With the presence of the internet, management of functional processes will be easier.

Having an online school system is the aim of this project which will help us to stay up to date with the developing technology. This online school system will replace the paper based collection of data and exchange of information manually in a particular school.

As a summary:

- 1. The current scenario reveals that teachers are burdened with a lot of organizational work along with their basic task of teaching.
- 2. Organizational work is performed on Excel Spreadsheets those are difficult to collaborate with and keep all data in one place or on clumsy old-style software those are not easy to use and never fully featured.
- **3.** Each school has its own isolated support systems, relying on many paper or spreadsheet-based tools. Also, some operate under individual rules, processes and guidelines. There is no centralized system where all the schools' staff could execute their tasks, or one
 - **4.** Where the management was able to gather real-time data about all the schools' operations.

Which is why we deeming the need for a complete overhaul of the system and introduce our OSMS as a far better solution. A software application for educational establishments to manage school tasks, teacher tasks, and student data, provide capabilities for entering student test and other assessment scores, building student schedules, tracking student attendance, and managing many other student-related needs in a school.

SYSTEM DESCRIPTION (Planning)

- A computerized system would be analyzed and designed throughout this project
- This system will allow teachers, advisors, parents and students to access it
- Accounts for all users will be handled every new academic year and given to students and the entire staff
- Assignments, notes, events, news and marks would be uploaded on the system
- This system could be accessed anywhere and anytime
- Users use their accounts to login and use the system
- The admin has all rights over the system and can moderate and delete any details

The modules covered in OSMS are:

- 1. Management Dashboard: reports of operational, HR and financial data...
- 2. Directorate Dashboard
- 3. Student Admissions: applications status, registration, admission tests and document submissions
- 4. Student Medical Information: with social support
- 5. Program & Class Structure: course lists by year, management of rooms and equipment, timetable generation, timetable view and class lists
- 6. Human Resources
- 7. Teacher Records: timetable, summaries (lesson notes), teachers list
- 8. Student Attendance: absence justification
- 9. Student Information: Students list, personal info, grades
- 10. Document Management: certificates, legal documents and others
- 11. Transfer certificate
- 12. Event Management
- 13. Examinations: exam timetables, grading
- 14. e-Report Cards: specified reports for parents
- 15. Student Fees & Scholarships: integrated with the central financial system including payment/refund and scholarship management (applications / interview candidate process)

- 16. Financial Accounts
- 17. User Management: enabling different user profiles that allow for each user to manage and access the right information, depending on their profile (Student, Parent, Teacher, Principal, Management, System Admin, etc.) as well as improved security throughout the system
- 18. Employee Login
- 19. Library
- 20. Transport
- 21. Various Reports

3.3 Functional requirements

- 1- School management system shall be network base
- 2- Admin shall add new student, teacher, and class and modify them.
- 3- Admin shall update school news i.e. Define different roles and assign privileges.
- 4- Display list of system users.
- 5- Allow registration and updates of users to the system.
- 6- Validate logins information (username and password) entered by the user in order to use the system and allow the registered user to login/out to the system.
- 7- Record the detailed information of a registered user to the system.
- 8- Track user login and logout information to/from the system, make updates to the record and View records of logins.
- 9- Allow registration of courses to the system, creation and updates of course chapter, chapter topics and assessment activities.
- 10- Record the detailed information of a registered course to the system.
- 11- Allow registration of a user to a course.
- 12- Record the detailed information of a registered user to a course to the system.
- 13- Display the home page of the role.
- 14- Find a course and display links of a list of all chapters, past papers and a link to syllabus for a selected course.
- 15- Track student's interaction with the course, update and view those records.
- 16- Display available resources for the role.
- 17- Track student's interaction with assessment activities (mostly exams), update and view them.
- 18- Generate time table.
- 19- Display calendar.
- 20-View the news event of the school
- 21-Display help for system functionality.
- 22-Handle massage transfer between users.

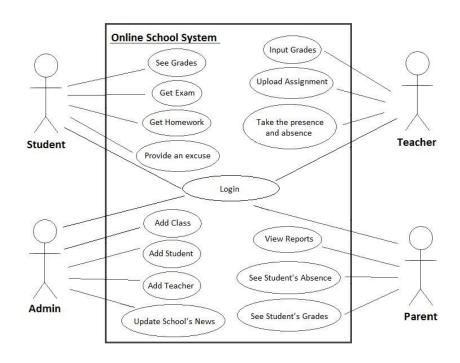
- 23-Handle system database backups.
- 24-Admin shall manage the school activity
- 25-Student shall submit assignment online
- 26-Student shall communicate the teacher
- 27-Teacher shall communicate with admin, student and parents of the student.
 - 28-Teacher shall assign assignments to this student
 - 29-Teacher shall mark attendance online
 - 30-Teacher shall declare result online
 - 31-Parents shall view reports of his child
 - 32-Parents shall communicate with teacher
- 33-The system must be designed to be user friendly. The system interfaces should be simple and easy to use.
 - 34-The system should be safe to use.
 - 35-The system response time should be short.
 - 36-The system allows registering and admitting a new student
- 37-The system allows maintains on the records of student marks that got in particular class
- 38-The system allows teacher to manage the whole record of student like quiz, assignment, midterms and final exams marks
- 39-The system allows teacher add, delete, update, and view student record of academic performance and his/her fees records.
- 40-The system allows Directorate viewing the whole schools record of students and teachers and other information.

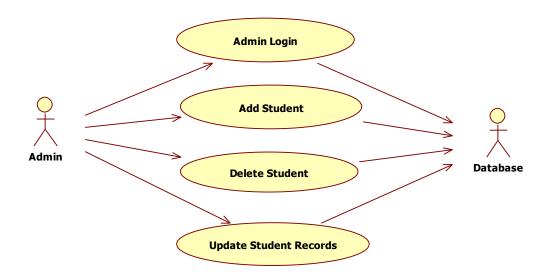
3.4 Non Functional requirements

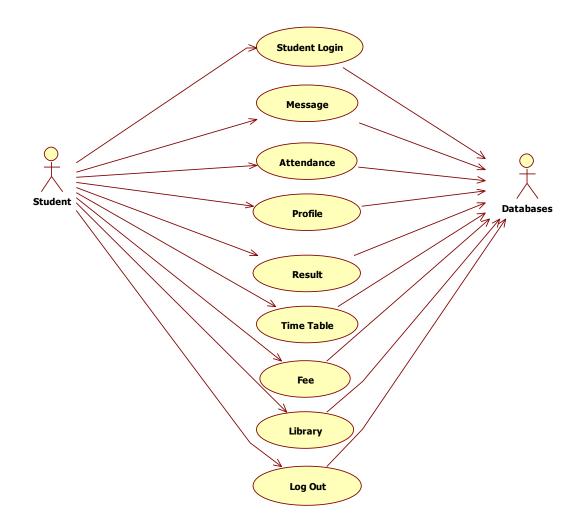
- 1. The system should be easy to use.
- 2. The system should be available 24 hours.
- 3. System should provide specific information to specific user.
- 4. Right information is available to right student and teacher at right time.
- 5. Employees must respond to requests quickly.
- 6. The system should be easy to maintain.
- 7. The system response time should be short.
- 8. The system should be reliable
- 9. Protecting the database and the information stored
- 10. Mirroring and replication of the database so as to ensure high availability to end users

3.5 **Project Requirement Analysis**

3.5.1 Use Case







DOCUMENTATION OF USE CASE DIAGRAMS

The actors in this use case diagram are Admin, Student, and Database. The use cases are the activities performed by actors.

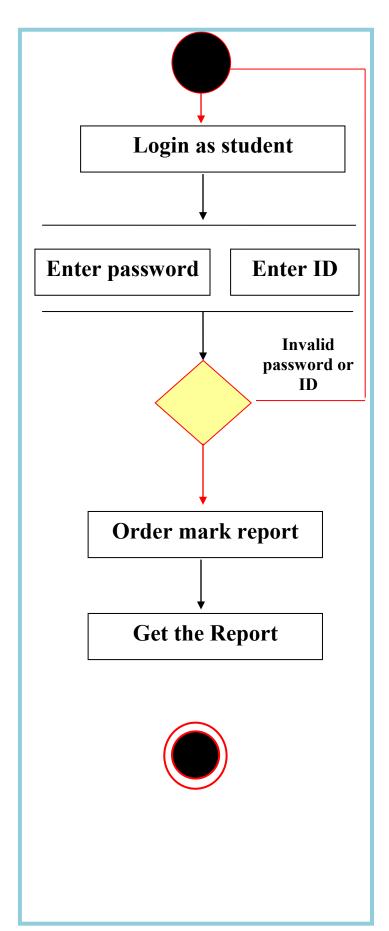
- a. Admin register login, and store the student records details in database.
- b. Student Register from the Student Login process.
- c. Then the database is searched for details and verified.
- d. Database stores the details and returns acknowledgement

3.5.2 Scenario

✓ Scenario (order mark Report)

1-someone opened the website , choose students login Tap.

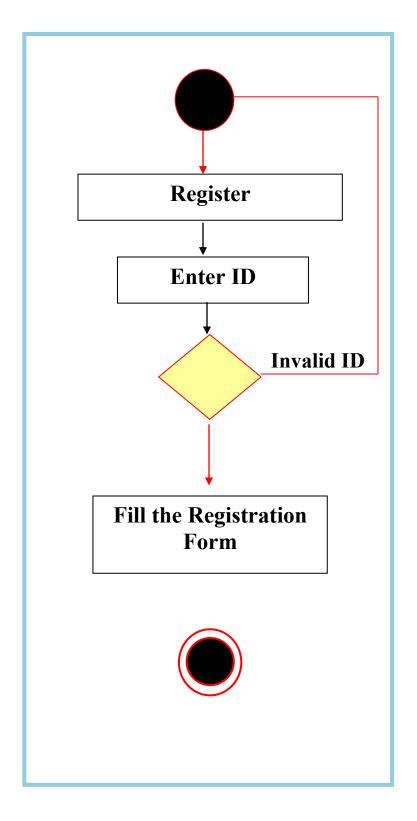
- 2- She/he fills her/his password and ID field
- 3-she/he ordered her/his mark report.
- 4- Get the report after a few of minutes



✓ Scenario (Registration)

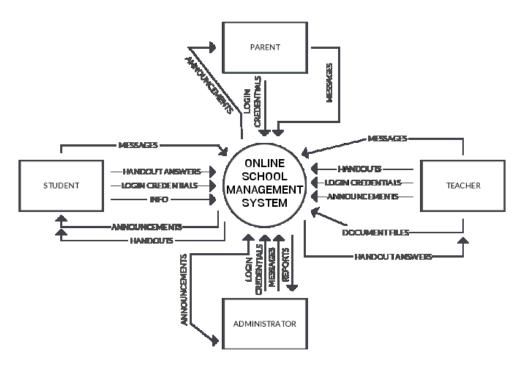
1-someone opened the website And choose the registration Tab.

- 2-she/he fills her/his student ID field
- 3-The system check if it was in data Base or not.
- 4-She/He fill the registration form

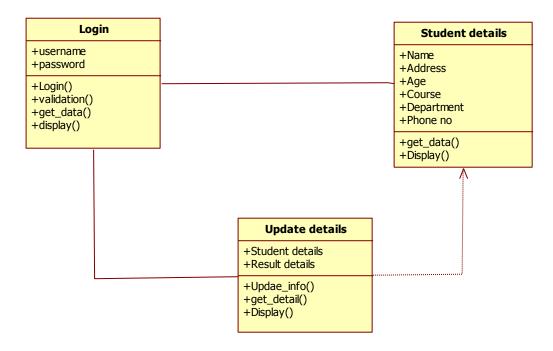


3.6 Process modeling

3.6.1 Context diagram



3.6.2 Class Diagram



DOCUMENTATION OF CLASS DIAGRAM

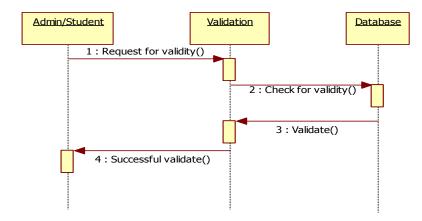
This class diagram has three classes Login, Student details and Update details in database.

- a. Students is the class name. Its attributes are name, Address, DOB, Gender, College, Subjects, Semester, Year, Degree, and Branch. The operations Performed in the student's class, Store database and Update.
- b. Administration— is the class name. Its attributes are Login, Password and database. The operations performed are Student Details store in database and send acknowledgement.
- c. Database is the class name. The operations performed are storing Search and storing the values.

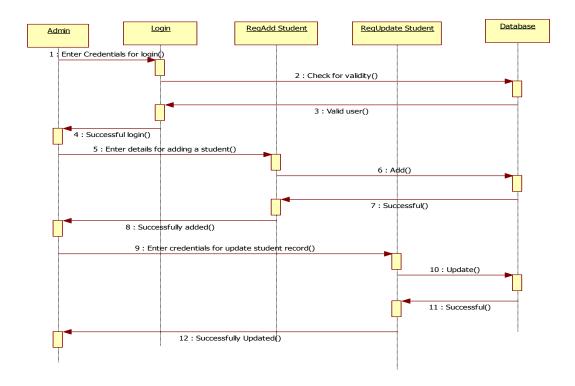
3.7 Logic Modeling

3.7.1 Sequence diagram

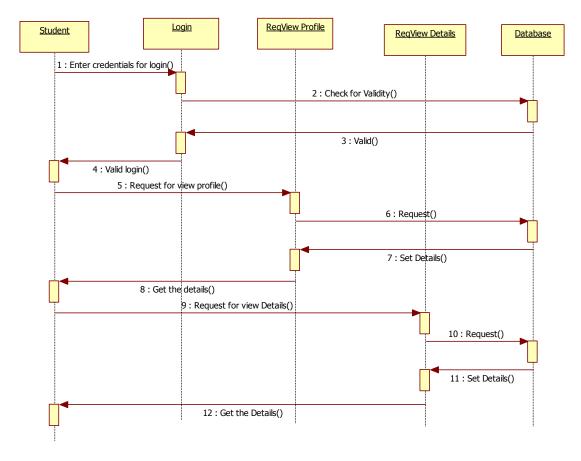
For Validity



For Administrator



For Student



DOCUMENTATION OF SEQUENCE DIAGRAMS

The sequence diagram describes the sequence of steps to show

- a. The Admin login and registering for Add Student Details.
- b. The verification done by the interface and sending acknowledgement for registration.
- c. Searching the database with login and displaying it for maintenance

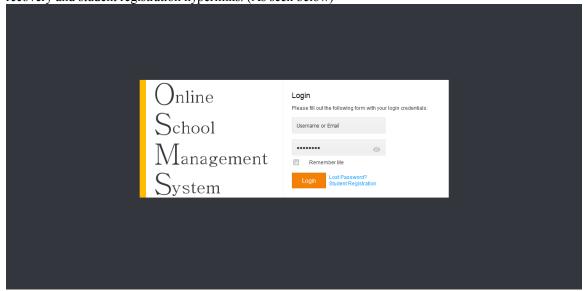
Design Phase

4.1 Graphical user interface.

The following screenshots show the overall design and elements of the Graphical user interface to serve the users of Online School Management System, with brief descriptions.

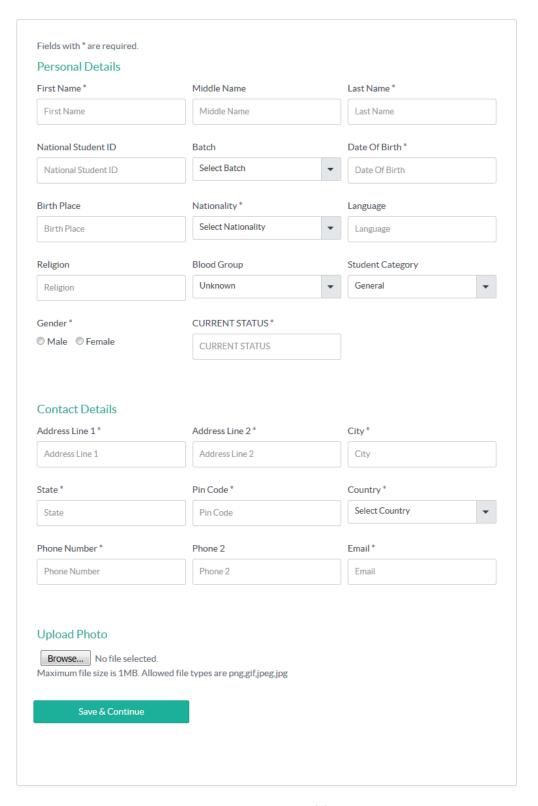
1- Main views:

Login screen: Primary entry point for the service with normal login information needed as well as password recovery and student registration hyperlinks. (As seen below)



Student registration (enrolment): A form to be filled with various needed attributes for a student to be reviewed by administration staff of the school and either accept of decline the student, many of these attributes are personal identification information such as Name, others for past record if not first school, others for contacting the individual, and a personal photo, more attributes will be unlocked to be filled by student on administration staff request after acceptance, meanwhile on completion of the form an email detailing further details and a trigger to the school admins. (As seen below)

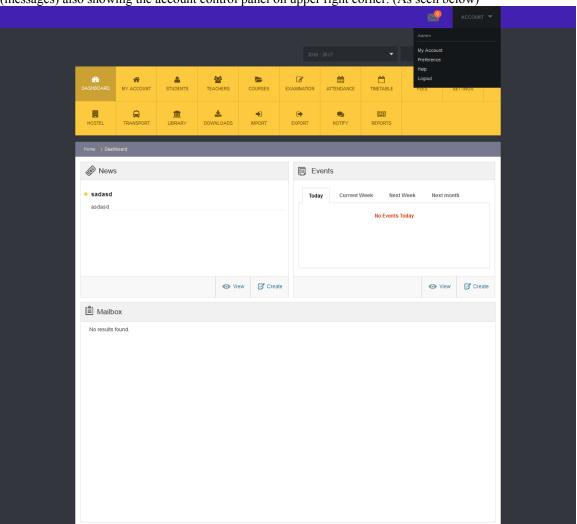
Student Enrolment - Student Information



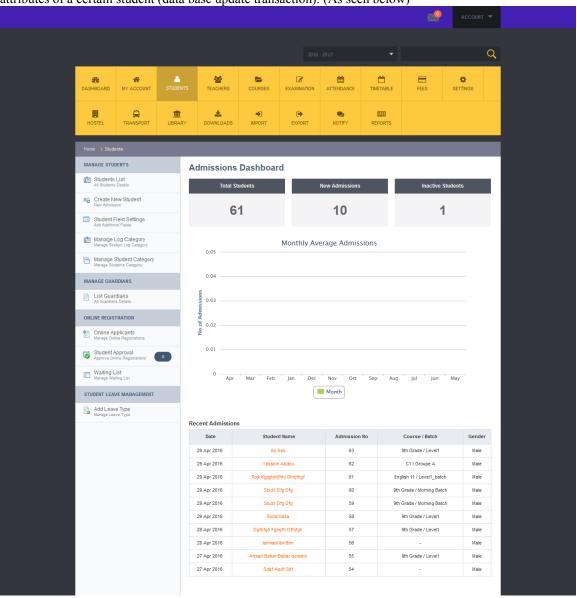
2- Administrator views: Tabbed view of admin specific privileges.

Dashboard tab: In this the administrator sees all of the relevant information in the news, events, and his own mail

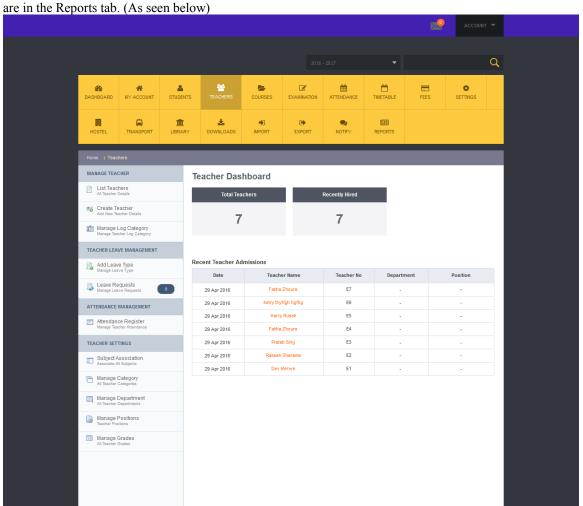
(messages) also showing the account control panel on upper right corner. (As seen below)



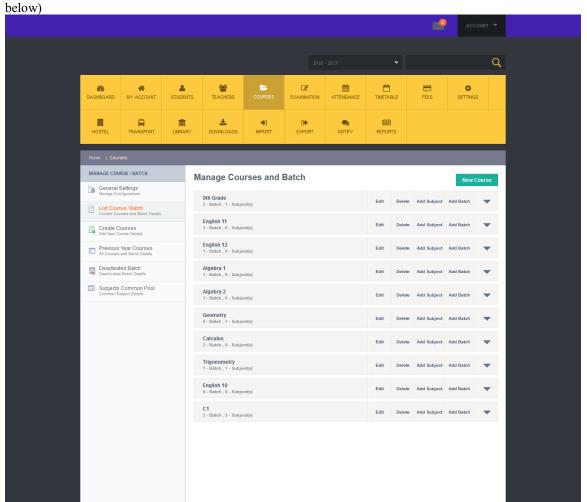
Students tab: While a student is registered a tracking of progress and status changes as a record data will be kept in the system and viewed with different aggregation functions and data mining processes will be made to produce the summary information viewed by the admin with this tab, although it also contains any management related functions to be manipulated by any of the administration staff each to his level of access, for example changing specific attributes of a certain student (data base update transaction). (As seen below)



Teachers tab: For this one has many of the same functionalities as Students tab but with a specialized perspective of a teacher, it has a backend that processes all of the data kept and creates great managerial reports of how the teachers

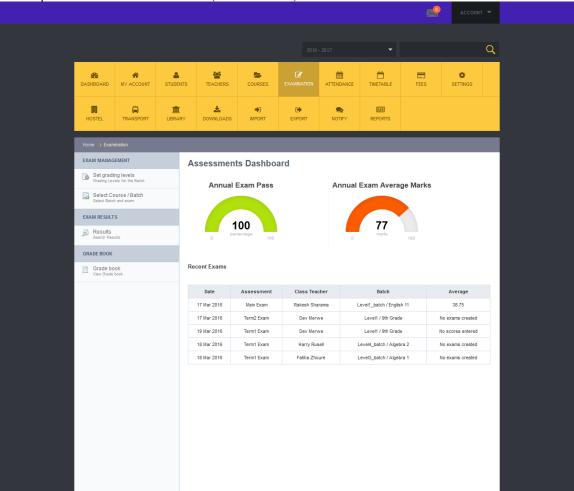


Courses tab: Relating to the school, in this one, a list of all taught subjects and details about each is shown with controls for editing, deleting, assigning course teachers and many functionalities for the students' batches. (As seen



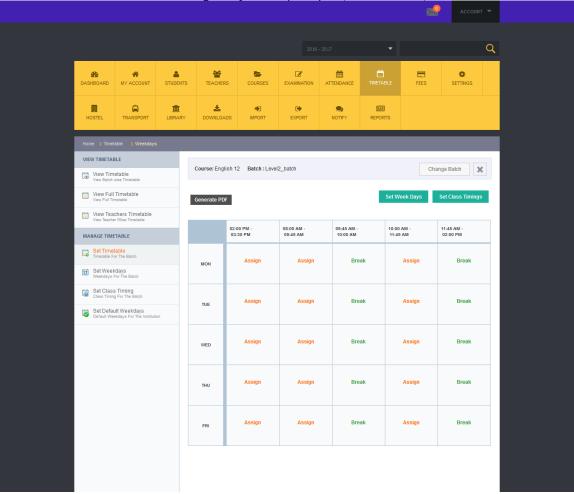
Examination tab: for controlling the assessments of students by course as well as Annual reports, this tab controls

admin specific tasks not teachers tasks. (As seen below)

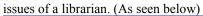


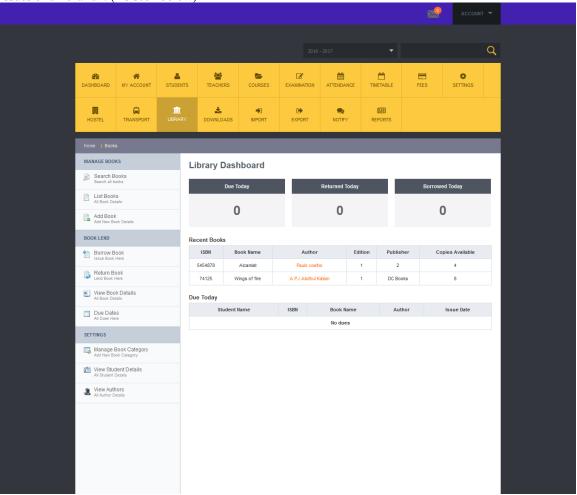
Timetable tab: For creating, viewing & editing timetables of both the batch filled with courses and the teachers

which is courses and work related assigned by school principal. (As seen below)

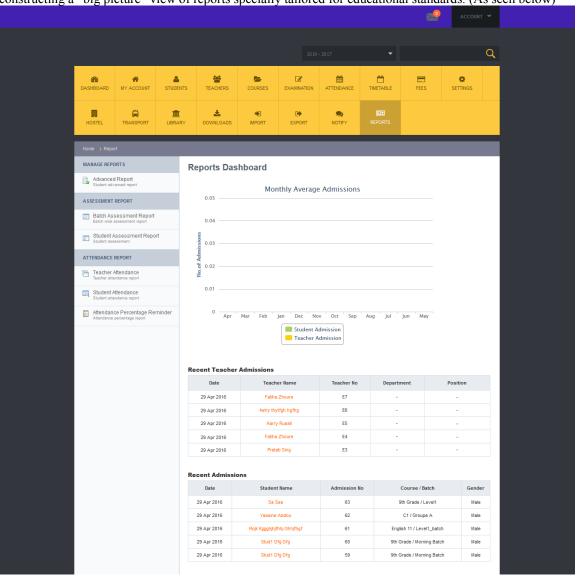


Library tab: for manager of library, to search the catalogue of available books, add newly acquired books, lending books to students with main emphasis on showing the current day jobs as well as tabular list of info covering main



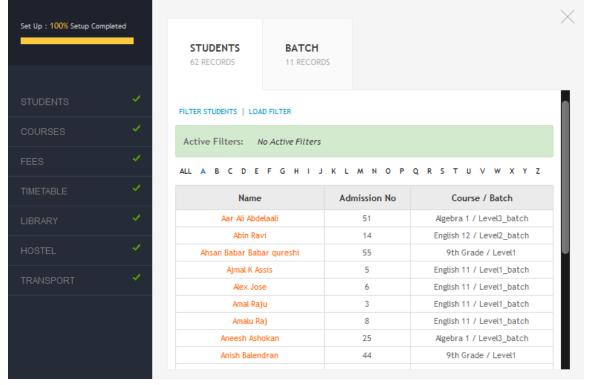


Reports tab: Used by administrator staff including school principal to improve their decision making effort by constructing a "big picture" view of reports specially tailored for educational standards. (As seen below)



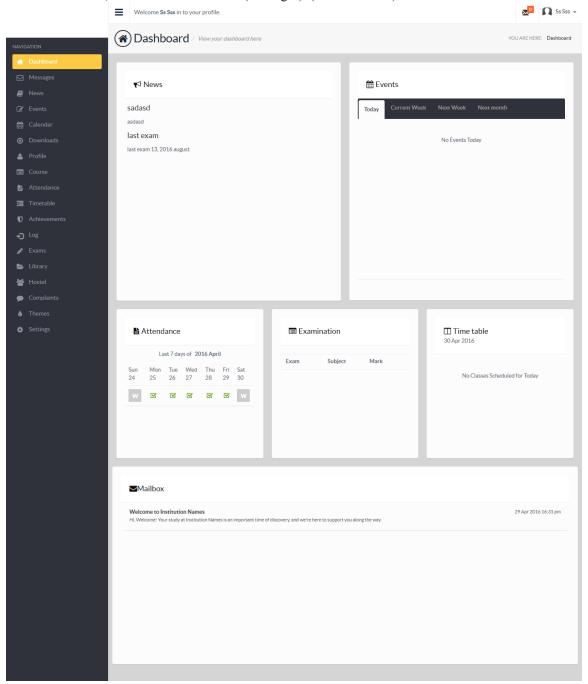
A system wide filter is automatically rendered and shown every time it is needed, which in essence contains all of

the recyclable data used by many other functions. (As seen below)

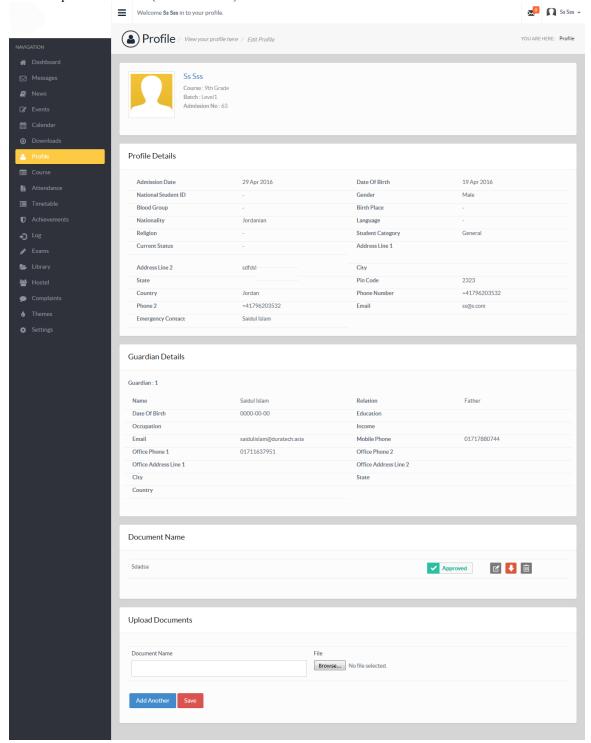


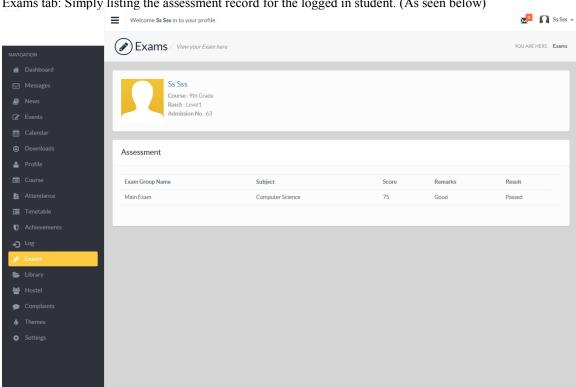
3- Student views: With a common navigation panel on the left the student specific functionalities in hierarchical encapsulation.

Dashboard tab: In this the student sees all of the relevant information in the news, events, his attendance record, timetable schedule, exams and his own mail (messages). (As seen below)

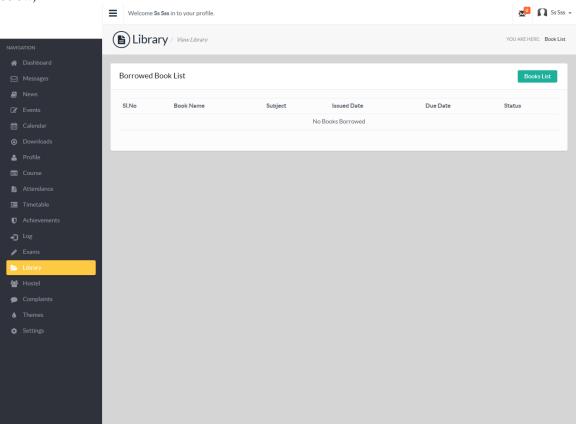


Profile tab: Details considering the student logged in, and related guardian (parent), documents upload such as when asked for past certificates. (As seen below)



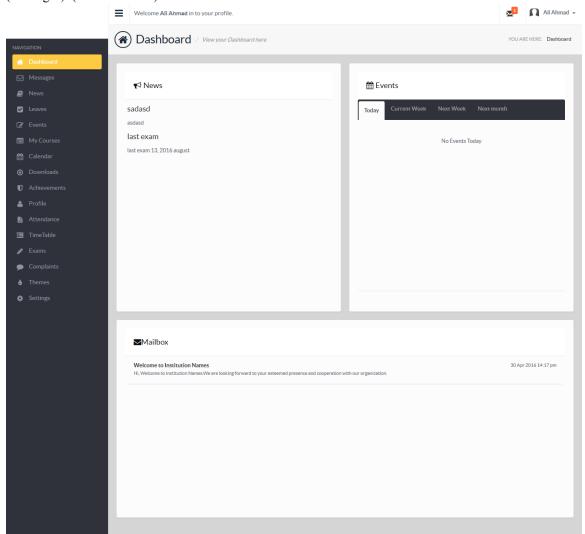


Library tab: Another simple list specific to the logged in student, detailing the books withheld by this student, the due date and status, the button [Books List] shall trigger a view of currently available books to borrow. (As seen below)

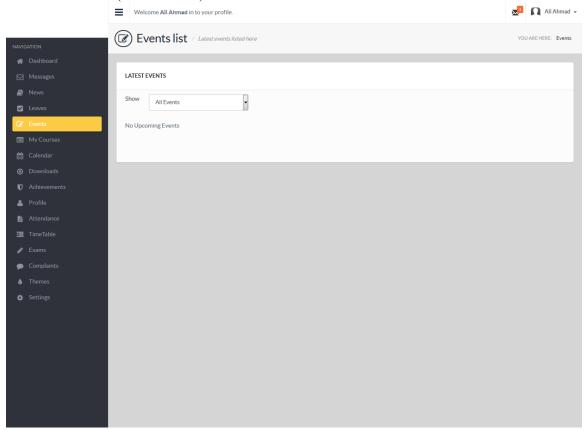


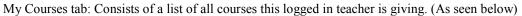
4- Teacher views: With a common navigation panel on the left, many of the functionalities reflect the needs of teachers and the level of control they need.

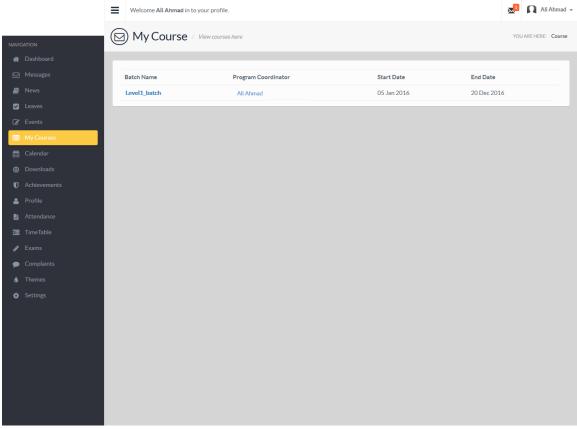
Dashboard tab: In this the teacher sees all of the relevant information in the news, events and his own mail (messages). (As seen below)



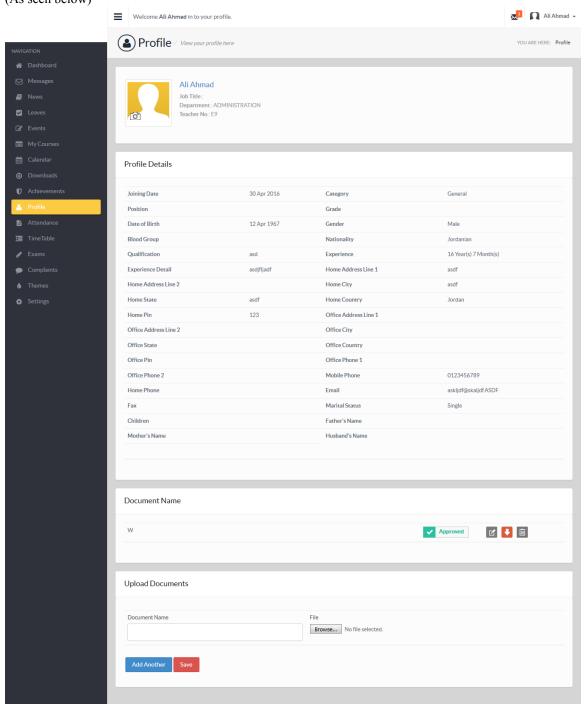
Events tab: Drop down list of event categories created by the system admin that may be initiated, monitored, and canceled by this particular teacher, when a category is chosen further view members are revealed such as event name and attributes. (As seen below)



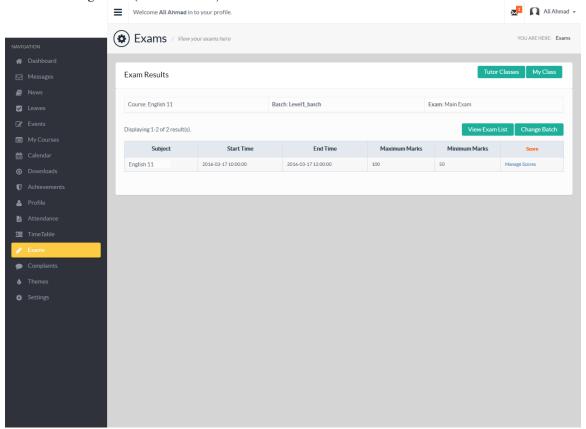




Profile tab: Details considering the teacher logged in, documents upload such as when asked for degree certificates. (As seen below)

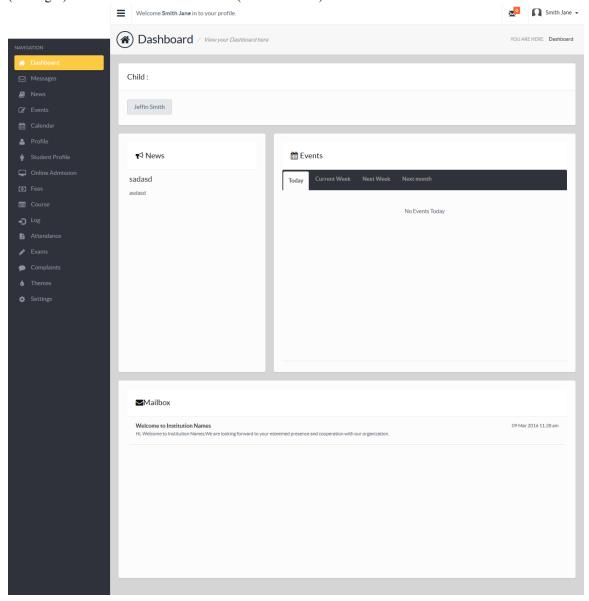


Exams tab: Shows all actions that can be done considering exams and other assessment events, for example creation and score management. (As seen below)

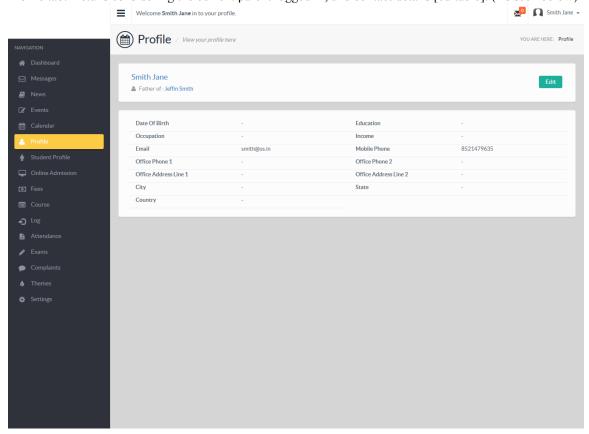


5- Parent (guardian) views: tailored to show the unique parent-child relation in education and how this will increase the level of exposure and monitor of a child's academic life whilst in the system.

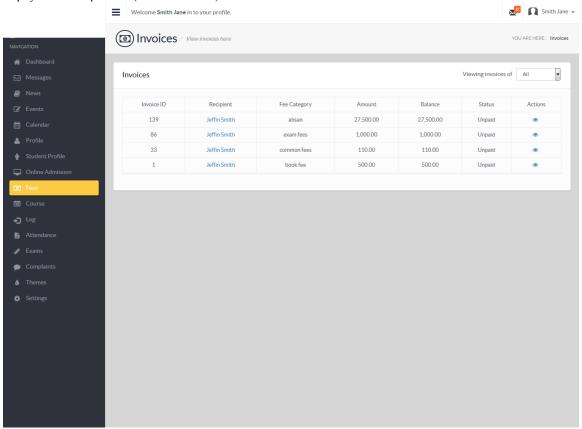
Dashboard tab: In this the parent sees all of the relevant information in the news, events and his own mail (messages) and the list of related students. (As seen below)



Profile tab: Details considering the current parent logged in, and contact details [editable]. (As seen below)



Fees tab: Here is a list of due invoices on the particular parent, and actions related to each invoice such as the ability to pay online or print it. (As seen below)



Exams tab: In this the parent will track his children's results and in comparison to the class average score. (As seen below)

