
Software Design Specification

for

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1. Project Overview

This document defines the software design for the proposed web application / service offered by the Service Provider and purchased by the Service Buyer.

This document provides a comprehensive design overview of the main functional behavior of system. It is intended to capture and convey the significant design and architectural decisions which have been made on the system.

2. Project Purpose

This software design document applies to process of managing and simplified the registration, work, payment, and activation of existing member of students, teachers, or employees within the Service Buyer company.

2.1 Actual Work Method

This document describes the requirements for a School Management System (SMS). The main goal of the system is to manage the business of running a typical school. The system deals with activities such as student enrolment, course management, and class, student, and teacher scheduling. It can also handle the basic accounting and billing. Through the system, the proprietor can keep track of a student's attendance and can bill such students accordingly. Also, through the same system, teachers' class scheduling can be simplified.

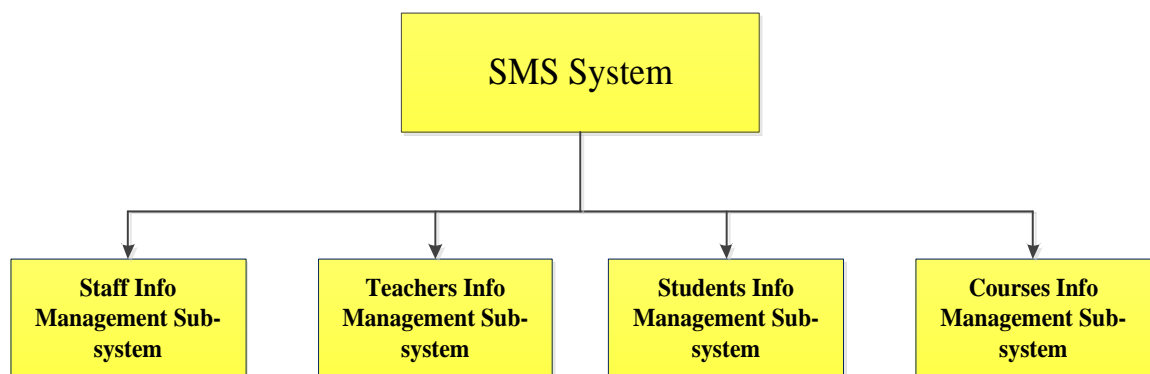


Fig 1: School Management System

This system will be developed with the state-of-the-art technologies and will incorporate innovative techniques to simplify business management. The simplicity of the user interface is of great importance.

We shall describe a complete system for managing a school. However, the system will be developed in phases depending on the needs and the criticality of the desired features. First, the data collection interfaces of the system will be designed taking into consideration the expected outputs, in terms of the expected reports and the reduced data-entry and processing errors.

2.2 Reported problems by the Service Buyer

With the actual work method, the following problems were reported by the Service Buyer:

1. The buyer is currently finding it difficult to manage the business.
2. It takes a lot of time and effort to make the invoices for the students.
3. The buyer would like to simplify the operations and reduce the amount of paperwork.
4. The need for reports of various kinds was reported. The buyer would also like to generate some statistical reports and present the reports in different formats.

2.3 Proposed Service

The Service Provider provides the following solutions to replace the existing manual system of the Service Buyer.

1. A system provides a secure access to authorized users only. The user interface for this should be simple and easy to use with little information expected from the end user.
2. The authorized users will be able to setup the data for the institution; this will involve:
 - a) the creation and retrieval of student records;
 - b) the creation and retrieval of teacher records;
 - c) the creation and retrieval of staff records;
 - d) course registration;
 - e) course scheduling;
 - f) student attendance management;
 - g) invoicing for students;
 - h) payment for teachers;
 - i) payment for staff.
3. It will provide a way of accessing the data over different computer systems; this makes it possible for several users to use the system simultaneously.
4. The application provides search capabilities by user ID.
5. The application can also provide search and filtering capabilities by other criteria.
6. This system will require some hardware setup as a database server. We are proposing two approaches for this:
 - a) hosting the server on the same computer as the client application;
 - b) hosting the server on a remote system in the cloud.
7. The system can also provide an embedded e-mail system.
8. If the institution has an existing cloud space (website/domain), we can generate and manage e-mails for the users.
9. The system should provide various valuable reports:
 - a) for accounting and for billing purposes;
 - b) to generate and print invoices for students;
 - c) to generate and print pay slips for teachers;
 - d) it can also be extended and integrated into an existing employee management system, if one already exists; and if none exists, it can serve to provide a simplified system to manage the payroll of the employees.

10. Reporting views can be generated using different criteria, to cite some:

- a) Report of staff information
 - i. per staff
 - ii. for all staff within a period
- b) Report of teachers information
 - i. per teachers
 - ii. for all teachers within a period
- c) Report of students information
 - i. per students
 - ii. for all students within a period

11. The system will generate all user IDs automatically using a scheme defined in the database by the administrator.

3. Service Functional Capabilities and Behavior

This section gives a description of the functional capabilities and behavior including some snapshots to the interfaces that are expected to be implemented. The presented snapshots in this section are for demonstration purposes only and are not intentioned to be applicable to the real implementation of the service as it is.

All the services are protected by an encrypted access. The first view is a login view where the users should enter their respective usernames and passwords.

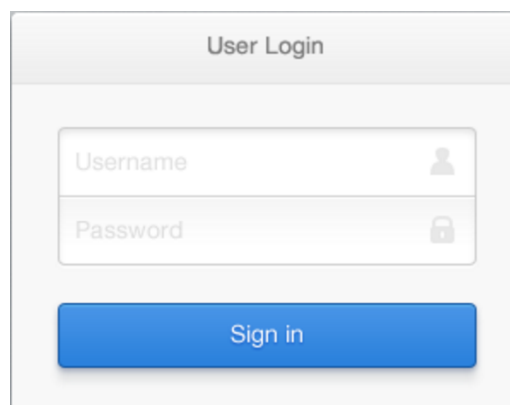
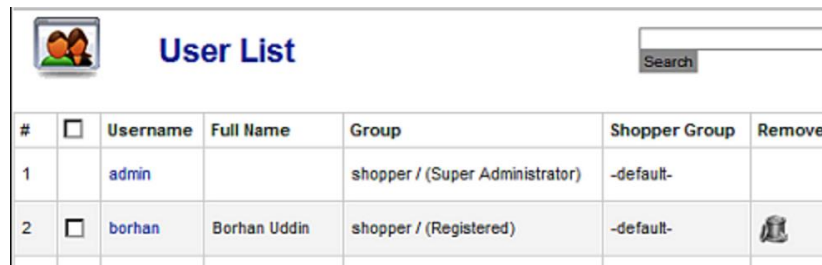
The image shows a 'User Login' window. It has a title bar with the text 'User Login'. Below the title bar, there are two input fields. The first field is labeled 'Username' and has a user icon to its right. The second field is labeled 'Password' and has a lock icon to its right. Below these fields is a blue button with the text 'Sign in'.

Fig 1: Login Interface

The application contains three main sections that are password-protected:

1. Administration Section: the admin section has a complete access over the application, it shares the same rights provided in the admin section in addition to the rights of edit admins profiles, add admins, delete admin and block admins.




#	<input type="checkbox"/>	Username	Full Name	Group	Shopper Group	Remove
1		admin		shopper / (Super Administrator)	-default-	
2	<input type="checkbox"/>	borhan	Borhan Uddin	shopper / (Registered)	-default-	

Fig 2: Admin Users Manager

- The admin will create for each user of the system is given a login name and a password. After a user has been authenticated, the user is presented with a page that displays the different actions that the user can perform.

3.1 User Interfaces

The following figure titled *List of Users* shows the form that displays information about the staff, teachers, students, and the courses that this institution offers. The form comprises of four tabs: the first tab displays a list of the staff working in the institution; the second tab displays a list of the teachers working in the institution; the third displays the information about the students currently enrolled; and the last tab displays the list of courses that are currently offered by the institution.

3.1.1 Staff User Interface

The first tab of the list of users form is about staff information. It is the currently active tab and is colored green; while the rest of the tabs are displayed in yellow color. The title of the form is the title of the currently active tab. In the figure below, the active tab is Staff. Thus the title of the form is List of Staff.

List of Staff

	Staff	Teachers	Students	Courses
<input type="radio"/>	ID	Name	Schedule	Summery
<input checked="" type="radio"/>	E2018004	Sarah Tomonti	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery

Fig 3: List of the staff of this institution

3.1.2 Teacher User Interface

In the figure below, the active tab is Teachers. Thus the title of the form is List of Teachers.

List of Teachers

	Staff	Teachers	Students	Courses
<input type="radio"/>	ID	Name	Schedule	Summery
<input checked="" type="radio"/>	T2018001	Othman Saleh Abdussalam	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery

Fig 4: List of the teachers of this institution

When a row is selected from the table or list in the form, a new form named Schedule is opened. This form allows the setting up of courses for a given teacher. The form has two lists. The first list contains all the currently active courses; this is a read-only list. The second list is the list that will contain all the courses that this teacher has been scheduled to teach. To make the schedule, the user selects from the left list and then clicks on the button with the right arrow to add the selection to the list on the right. A selection of multiple items from the list is allowed.

Schedule

T2018001: Othman Saleh Abdussalam

- 105: Math
- 305: Arabic
- 203: English
- 405: Science
- 505: French

Add

→

- 203: English
- 405: Science

Save
Remove

Fig 5: Setting up of courses for a given teacher

The Remove button can be used to remove a selected item from the right list. Items cannot be removed from the left list. Once, this schedule has been completed, the user clicks on Save to commit or save the schedule.

3.1.3 Student User Interface

The following form is similar to the *List of Teachers* discussed earlier. The only difference is that while the *List of Teachers* is about scheduling courses for teachers, the form or the tab below (*List of Students*) is about student information. The form or tab works as described earlier.

	Staff	Teachers	Students	Courses
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input checked="" type="radio"/>	S20180377	Michel Kubbar	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery
<input type="radio"/>	ID	Name	Schedule	Summery

Fig 6: List of the students of this institution

When a row is selected from the table or list in the form, a new form named Schedule is opened. As in teachers section, this form allows the setting up of courses for a given teacher.

Schedule

S20180377: Michel Kubbar

- 105: Math
- 305: Arabic
- 203: English
- 405: Science
- 505: French

➔
Add

- 305: Arabic
- 203: English
- 505: French

Save
Remove

Fig 7: Setting up of courses for a given student

The Remove button can be used to remove a selected item from the right list. Items cannot be removed from the left list. Once, this schedule has been completed, the user clicks on Save to commit or save the schedule.

3.1.4 Course User Interface

The next tab (List of Courses) displays the list of currently active courses. This allows a quick view of all the courses that are currently available at this institution.

	Staff	Teachers	Students	Courses
<input type="radio"/>	105	Math		Schedule Summery
<input type="radio"/>	203	English		Schedule Summery
<input type="radio"/>	305	Arabic		Schedule Summery
<input type="radio"/>	405	Science		Schedule Summery
<input checked="" type="radio"/>	505	French		Schedule Summery
<input type="radio"/>	ID	Name		Schedule Summery
<input type="radio"/>	ID	Name		Schedule Summery
<input type="radio"/>	ID	Name		Schedule Summery

Fig 8: List of the courses of this institution

3.2 Record Retrieve

3.2.1 Stuff Record

The Stuff Record shown below allows a fast retrieval of a student's or teacher's record. When an ID is given, the user clicks on the Submit button to look up the record associated with the ID. If the record exists, it is displayed in a form. However, if the user clicks on the Register button, a new form is open for creating a record for the entity – it may be a record for a new student, a new teacher, or another entity.

Staff Record

ID:

Fig 9: Retrieval Stuff Record

The form below allows a new record to be created. This form collects the relevant data about the entity that is being created. The ID is automatically generated using a scheme

described later in this document. Once all that data have been entered and validated, the user can save the data or cancel the operation by clicking on the appropriate button.

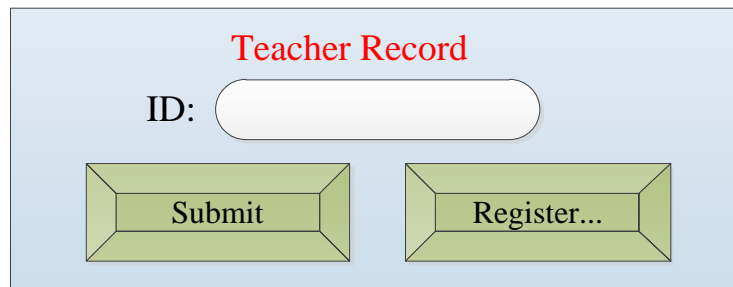
Staff Record		SIN#	<input type="text"/>
Stuff ID:	<input type="text"/>	Gender:	<input type="text"/>
First Name:	<input type="text"/>	Last Name:	<input type="text"/>
Address:		Phone:	<input type="text"/>
Unit#:	<input type="text"/>	Building#:	<input type="text"/>
Street Name:		Email:	<input type="text"/>
City:	<input type="text"/>	Province:	<input type="text"/>
		Active:	<input type="checkbox"/>
		<input type="button" value="Save"/>	<input type="button" value="Cancel"/>

Fig 10: Create New Staff Record

Staff Record		SIN#	222-333-444
Stuff ID:	E2018004	Gender:	Female
First Name:	Sarah	Last Name:	Tomonti
Address:		Phone:	+15148887777
Unit#:	444	Building#:	4577
Street Name:		Email:	Email@mail.com
City:		Province:	Quebec
Balance		00.00	
		Active:	<input checked="" type="checkbox"/>
		<input type="button" value="Edit"/>	<input type="button" value="Cancel"/>

3.2.2 Teacher Record

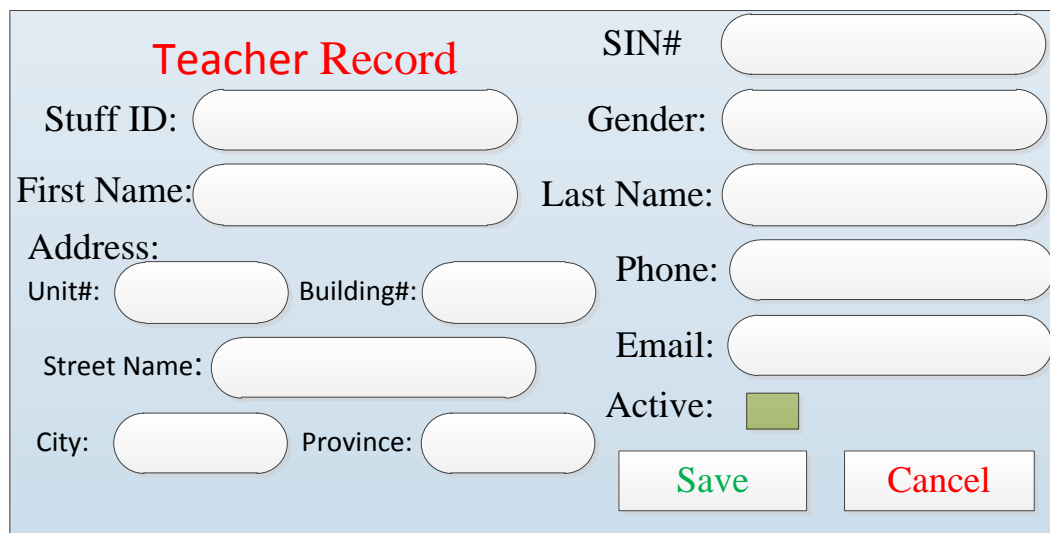
A teacher's record can be retrieved or created as described above while describing the Staff Record



Teacher Record

ID:

Fig 11: Retrieval Teacher Record



Teacher Record

SIN#

Stuff ID: Gender:

First Name: Last Name:

Address:

Unit#: Building#: Phone:

Street Name: Email:

City: Province: Active: ☐

Fig 12: Create New Teacher Record



Teacher Record

SIN# 111-333-444

Stuff ID: T2018001 Gender: Male

First Name: Othman Saleh Last Name: Abdussalam

Address:

Unit#: 324 Building#: 4577 Phone: +15143337777

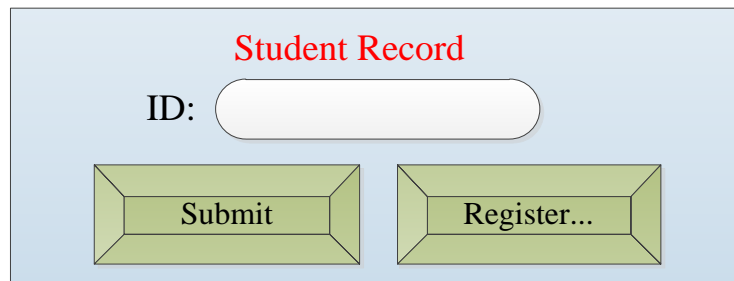
Street Name: Henri Bourassa West. Email: Email@mail.com

City: Montreal Province: Quebec Active: ☒

Balance 00.00

3.2.3 Student Record

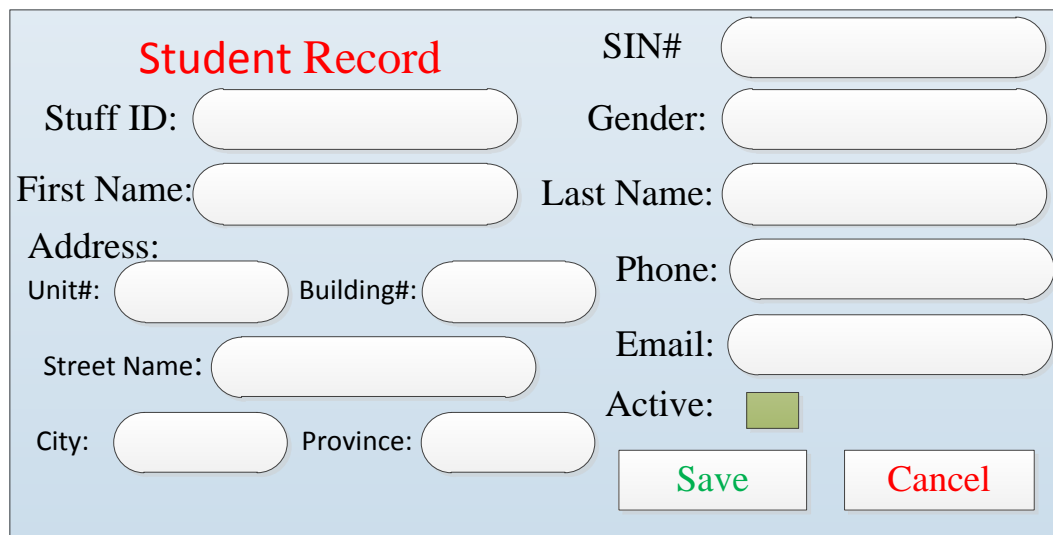
A student's record can be retrieved or created in a manner similar to the way a teacher's record is created or retrieved using the student ID.



Student Record

ID:

Fig 13: Retrieval Student Record



Student Record

SIN#

Stuff ID: Gender:

First Name: Last Name:


Address:

Unit#: Building#: Phone:

Street Name: Email:

City: Province: Active: ☐

Fig 14: Create New Student Record



Student Record

SIN# 222-555-444

Stuff ID: S20180377 Gender: Male

First Name: Michel Last Name: Kubbar

Address:

Unit#: 12 Building#: 4688 Phone: +15148886655

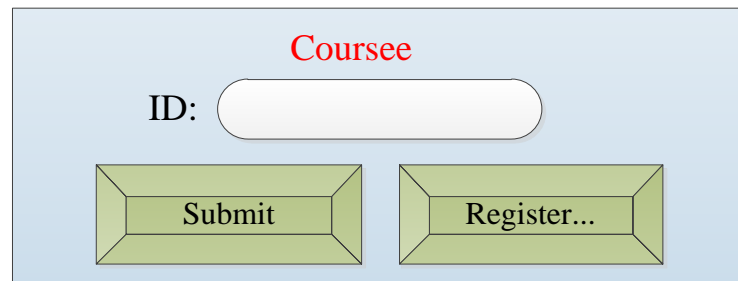
Street Name: Henri Bourassa West. Email: Email@mail.com

City: Montreal Province: Quebec Active: ☒

Balance 00.00

3.2.4 Course Record

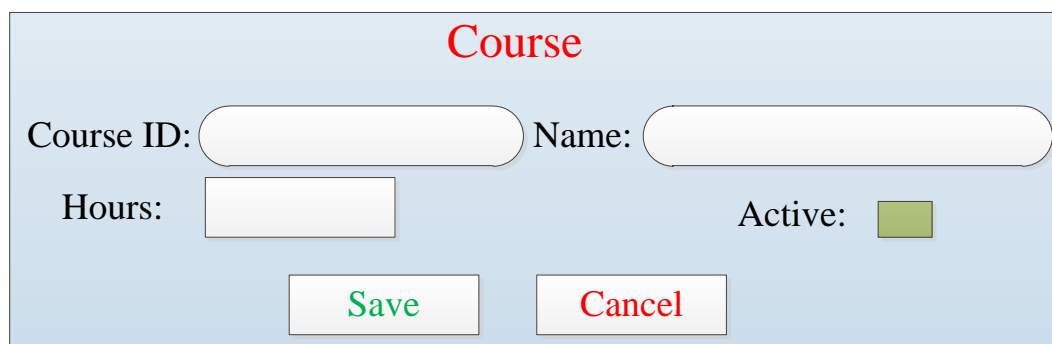
A record is created for each course that is offered by the institution using the Course form shown below.



The form is titled "Coursee" in red. It contains a label "ID:" followed by a white rounded rectangular input field. Below the input field are two green rectangular buttons with black text: "Submit" on the left and "Register..." on the right.

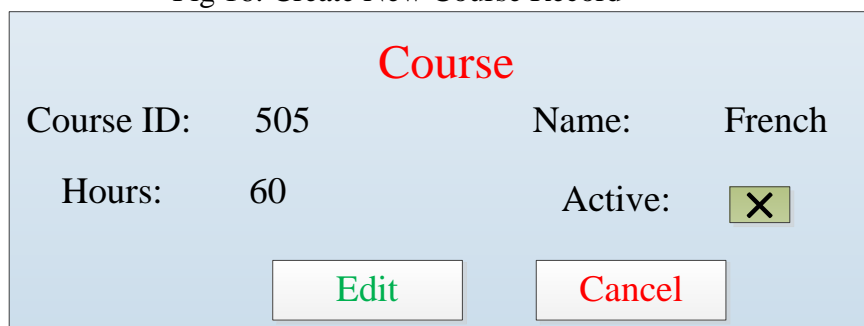
Fig 15: Retrieval Course Record

The course form collects the ID, the name of the course, the number of hours for the course, and a status flag showing whether the course is currently active or is not offered at this time by the institution.



The form is titled "Course" in red. It contains four input fields: "Course ID:" (white rounded rectangle), "Name:" (white rounded rectangle), "Hours:" (white rectangle), and "Active:" (green square). Below the input fields are two rectangular buttons: "Save" in green text on a white background, and "Cancel" in red text on a white background.

Fig 16: Create New Course Record



The form is titled "Course" in red. It displays the following data: "Course ID: 505", "Name: French", "Hours: 60", and "Active: X" (where X is in a green square). Below the data are two rectangular buttons: "Edit" in green text on a white background, and "Cancel" in red text on a white background.

4. Daily Menu

4.1 Daily Student Menu

The Daily Student Menu allows a user to view or change the daily schedule for a student. This simplifies the accounting of the number of hours in a day a student has attended classes. It can facilitate billing and invoice generation.

Wednesday 04Mar2018

Daily Students' Menu

Num	Name	Hours	Price
105	Math	3	20
203	English	2	15

☐
Mohammed Zidan
Courses=2

☐
Abobaker Khalid
Courses=1

105	Math	3	20
-----	------	---	----

☐
Omar Salem
Courses=2

305	Arabic	2	15
203	English	2	15

☐
Othman Ali
Courses=3

105	Math	3	20
203	English	2	15
305	Arbic	2	15

Fig 17: Daily Student Menu

A rate is associated with each course during the setup of the course. However, it is possible to override the value set for the rate for each course on a case by case basis. That is, the rate for a course for a given student can be different from the rates set for other students. The system is flexible about this.

4.2 Daily Teacher Menu

Wednesday 04Mar2018

Daily Teachers' Menu

☐ Othman Saleh Courses=2

Num	Name	Hours	Price
105	Math	3	20
203	English	2	15

☐ Max Jhoun Courses=1

105	Math	3	20
-----	------	---	----

5. Pay Slip and Invoice

5.1 Pay Slip for Staff

Pay Slip for Staff

Staff ID

Start: Date

End: Date

Staff Information:

Name: Sarah Tomonti

ID: E2018004

Address: 4605 Henri Bourassa. H4L5H6

Telephone: +1(514)227-9933

Email: Email@gmail.com

School Information:

Name: Le Professeur

Address: 4915 Salaberry. H4J1H8

Telephone: +1(514)443-3460

Email: info@leprofesseur.ca

Website: www.leprofesseur.ca

	From	to	Working/Hour	Price/Hour	Total
1	01 Mar 2018	31 Mar 2018	8	20	160.00
2	15 Mar 2018	31 Mar 2018	9	20	180.00
3	07 Mar 2018	31 Mar 2018	6	20	120.00

Due	Deposit	Balance	Due Date
460.00	460.00	0.00	01May2018

460.00

Print

Cancel

5.2 Pay Slip for Teacher

Pay Slip for Teacher

Teacher ID

Start: Date

End: Date

Teacher Information:

Name: Ramzi Algamoudi

ID: 55001

Address: 4655 Henri Bourassa. H4L5H6

Telephone: +1(514)227-9933

Email: Email@gmail.com

School Information:

Name: Le Professeur

Address: 4915 Salaberry. H4J1H8

Telephone: +1(514)443-3460

Email: info@leprofesseur.ca

Website: www.leprofesseur.ca

	From	to	Course#	Name	Hours	Price	Total
1	01 Mar 2018	31 Mar 2018	105	Math	110	35.00	3,850.00
2	15 Mar 2018	31 Mar 2018	203	English	80	30.00	2,400.00
3	07 Mar 2018	31 Mar 2018	305	Arabic	90	30.00	2,700.00

Print

Cancel

8,950.00

5.3 Student Invoice

Students Invoice

Student ID

Start: Date

End: Date

Student Information:
Name: Othman Ali
ID: 2018001
Address: 4655 Henri Bourassa. H4L5H6
Telephone: +1(514)817-3344
Email: Email@gmail.com

School Information:
Name: Le Professeur
Address: 4915 Salaberry. H4J1H8
Telephone: +1(514)443-3460
Email: info@leprofesseur.ca
Website: www.leprofesseur.ca

	From	to	Course#	Name	Hours	Price	Total
1	01 Mar 2018	31 Mar 2018	105	Math	12	20.00	240.00
2	15 Mar 2018	31 Mar 2018	203	English	6	15.00	90.00
3	07 Mar 2018	31 Mar 2018	305	Arabic	9	15.00	135.00

Due	Deposit	Balance	Due Date
465.00	300.00	165.00	01May2018

465.00

Print

Cancel

6. Service Technology

- Dynamic web pages: AngularJS / Tomcat / Maven / Web Services / Ajax / Json / JavaScript / HTML / CSS / JQuery
- MySQL Database