**COMSATS University Islamabad, Abbottabad Campus**

**Department of Computer Science**

**Project Proposal**

**School Management System**

**CSC392 Object Oriented Software Engineering**

Submitted on: <Date&Time>

Group Members:

Ali Said(FA20-BSE-4B-165)

Name 2 (Reg No.)

Name 3 (Reg No.)

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# CHAPTER 1 PROJECT PROPOSAL

## Introduction

School Management system, required for effective software development, to manage the overall data of a school

## Vision and Business Case

In the offline system, it is an overhead to keep the records related to faculty, student, parents, and other school staff on the papers. Everything related to their progress in the system is marked manually. For example A report of a student’s attendance is generated monthly is shown to his/her parents. Now, a regular student, going to school every day, is marked absent for a day by mistake.

It is a burden to take out the register and view the records. As you can see, it is a very time-consuming process and it costs much. So, I thought why I should not help these young guns of the nations to help them to have a bright future and to make an online centralized platform that can be accessed from anywhere in the world.

My other aim is to minimize the paperwork as minimum as I can so that there is no need to cut more and more trees. Indirectly, I will be helping Mother Nature.

## Use-Case Model

The functional requirements of school management system are:

1. Multi-User Account System
2. Student Fee Management
3. Parent Monitoring Feature
4. Homework Document
5. Class Routine Schedule
6. Profile System
7. Exam Marks Management
8. Chart & Graph Analysis of Exams
9. Daily Attendance
10. Internal Messaging

## Supplementary Specification

1. Events management

## Glossary

## Having a dynamic system with a bird view of data and reports can give next level of power and quickness in decision-making for principal or management person. School management System provides extra ordinary Management Dashboard and data reporting functions along with dynamic access rights mechanism which becomes a blessing for management personnel.

## Risk List & Risk Management Plan

***Describes the risks (business, technical, resource, schedule) and ideas for their mitigation or response.***

**1. Malware**

Digital hackers are watching your every move and trick you to download malware and take control of your computer remotely. They use malware to attack computer networks to perpetrate crimes.  Fraudsters use virus, malware, spyware, spams, and phishing to gain access to your sensitive personal information and commit financial crimes. Defend your data against malware through secure servers, whether physical or in cloud, and shield against vulnerabilities.

**2. Theft & Loss**

Unauthorized users without permissions who have access to sensitive data can cause harm to educational institutions as a result of theft. There is a risk of the sensitive academic data will be leaked by staff. It becomes easy to lose your storage media with backup data due to misplacement or theft. When you suffer data loss due to various incidents such as mechanical damage, power failure, software crash, disasters or loss of your laptops and mobile devices, it is another way of inadvertent data exposure. Keep all your data safe and secure using role-based access control to ensure confidentiality and privacy.

**3. Unsafe data**

If adequate safety precautions are not taken when files and documents are shared in website, smartphones and tablets via internet networks, the information contained on them might gain access to the devices and get exposed to risks. We can make use of cloud deployments to manage the education system better and better.

**4. Negligence**

When data is stored in computers or laptops, it has become so natural that people lose the information when files are accidentally deleted or even it could fall into the wrong hands. Ensure a proper backup strategy to keep your data on important devices and run them smoothly without hassles.

# CHAPTER 2 USE CASES

## Use Case Diagram

## Brief Level Use

## Brief level use case:

Muhammad Nawaz Khan(FA20-BSE-073)

#### Use case: View Attendance

View attendance use case will use take attendance of students and faculty the attendance of faculty will be through biometric, and the record will be saved in database and the attendance of student will be taken by teachers and the record will be submitted on system. The admin and teacher can modify and view the attendance of student. The guardian and student can only view attendance.

### Ali Said(FA20-BSE-165)

#### Use Case: About Exams

In about exams use case faculty or staff can take exams directly from about exams section and take assignments directly from sub section assignments in about exams. It would be so ease for students as well as teachers to take/give exam or assignment in soft form . Teachers have to feed the questions on the about exams section after that teacher can set the timings for assignments or quizzes and set a deadline for submission. Exams marks would be marked automatically by the system but if teacher wants to change or over write he/she has access to do that. Students have access to upload file for assignments.

### Student Name 3 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

### Student Name 4 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

### Student Name 5 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

### Student Name 6 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

### Student Name 7 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

### Student Name 8 (Registration Number 1)

#### Use Case: Process Sale

A customer arrives at a checkout with items to purchase. The cashier uses the POS system to record each purchased item. The system presents a running total and line-item details. The customer enters payment information, which the system validates and records. The system updates inventory. The customer receives a receipt from the system and then leaves with the items.

Fully dressed use case:

### Muhammad Nawaz Khan (FA20-BSE-073)

| Use Case UC1: View Attendance |
| --- |

**scope**: view attendance

**primary Actors**: faculty, admin.

**Stake holder and interest:**

Teacher: Teacher wants to take attendance easily without any error and don’t want to carry extra register to mark students’ attendance.

Faculty: it is easy for faculty to mark attendance using biometric and the attendance is updated directly

In the system and there is less chance of errors to forgot attendance.

Student: students want to get rid of traditional list to check their attendance and the system is very useful to for student to view their updated attendance.

Guardian: The system also alerts the guardian if the student is absent.

Admin: managing the teachers and student attendance and classes this system is very difficult for admin.

The system generates class wise attendance lists and inform that which faculty member is absent.

**Preconditions:** student, teacher and admin must be identified and authenticated.

**Success guarantee** (or Postconditions): The process of Taking attendance become easy. View real time attendance. Accurate attendance Report for admin.

**Main success scenario or Basic flow:**

* Faculty marks their attendance through biometric.
* Teacher marks attendance of students using the system and records is saved in the database.
* The system generates attendance report for admin.
* System alert guardian if the student is absent.
* Students and guardians can view the real time attendance.

**Extension or alternative flows:**

At any time, the internet can be gone:

* During the marking or updating attendance any time the internet connection may be gone.
* The system will be interrupted, and the teacher will no be able to use the system.
* After the fixing the internet, the user will login and continue back to his work.

At any time, system fails:

* The system can fail any time. The system it will save the work.
* User will restart the system and request for recovery the system will start from the prior state.

If system does not recover:

* The user will suspend the operation and the system will show an error message.
* The user starts a new operation and continue to his work.

**Special requirements:**

* The user should have the computer to use the system.
* The internet must be connected.
* The user should be authorized and authenticated.

**Technology and Data Variations List**:

The must have computer connected to internet.

### Ali Said (FA20-BSE-165)

| Use Case UC1: About Exams |
| --- |
| **Scope**: School Management System  **Level**: user goal  **Primary** **Actor**: Student, Guardian, Faculty, Admin.  **Stakeholders and Interests**:  - Admin: Admin is the one who controls the whole school management system, its staff, and every other person or thing that is associated with the school. In other term, the admin is the most powerful entity of the system.  -Teacher: The teacher is one of the important entities for a school. The teachers are there to teach the students. The following are the features that will be available to the teachers.  -Student: The student is also one of the main parts of the system. The students can log in to the student account anytime they want.  -Parents/Guardians: It is important for the parents to be familiar with the status of their child how they are performing in the academy. To make this hassle-free, there is also an option available for the parents.  **Preconditions**: Students are identified and authenticated. |

**Success Guarantee** (or Postconditions): Teachers will feed questions and answers and then they will take quiz. Students have to give timeboxed quiz. After that system will automatically mark the quiz on the basis of feed questions.

**Main Success Scenario (or Basic Flow):**

1. Teacher will store the questions on the about exams section before taking quiz/assignment.
2. Teacher will set the deadline/duration of assignment/quiz.
3. Students will be notified about quiz or assignments in notification section.
4. Students will start the quiz or students will download the assignment file.
5. After answering few questions their quiz will end up or they can upload the assignment before deadline.
6. After deadline there will be no option available for quiz/assignment.
7. System will automatically mark the quizzes but in case of assignments teacher have to practically do it.
8. After teacher`s marking result will be sent to the result section and will be publicly available to students.

**Extensions (or Alternative Flows):**

At any time, admin requests can override operation:

1. The teacher set the exam.
2. Admin wants any other operation at that time frame.
3. The admin operation will override the teacher operation.
4. Teacher operation will be set to next timeframe available.

**Special Requirements:**

- Touch screen UI on a large flat panel monitor. Text must be visible from 1 meter.

- Page response within 3 seconds 90% of the time.

- Language internationalization on the text displayed.

**Technology and Data Variations List**:

1. Teachers can set up fingerprint or face unlock.

### Student Name 3 (Registration Number 1)

| Use Case UC1: Process Sale |
| --- |
| **Scope**: NextGen POS application  **Level**: user goal  **Primary** **Actor**: Cashier  **Stakeholders and Interests**:  - Cashier: Wants accurate, fast entry, and no payment errors, as cash drawer shortages are deducted from his/her salary.  - Salesperson: Wants sales commissions updated.  - Customer: Wants purchase and fast service with minimal effort. Wants easily visible display of entered items and prices. Wants proof of purchase to support returns.  - Company: Wants to accurately record transactions and satisfy customer interests. Wants to ensure that Payment Authorization Service payment receivables are recorded. Wants some fault tolerance to allow sales capture even if server components (e.g., remote credit validation) are unavailable. Wants automatic and fast update of accounting and inventory.  - Manager: Wants to be able to quickly perform override operations, and easily debug Cashier problems.  - Government Tax Agencies: Want to collect tax from every sale. May be multiple agencies, such as national, state, and county.  - Payment Authorization Service: Wants to receive digital authorization requests in the correct format and protocol. Wants to accurately account for their payables to the store.  **Preconditions**: Cashier is identified and authenticated. |

**Success Guarantee** (or Postconditions): Sale is saved. Tax is correctly calculated. Accounting and Inventory are updated. Commissions recorded. Receipt is generated. Payment authorization approvals are recorded.

**Main Success Scenario (or Basic Flow):**

1. Customer arrives at POS checkout with goods and/or services to purchase.
2. Cashier starts a new sale.
3. Cashier enters item identifier.
4. System records sale line item and presents item description, price, and running total. Price calculated from a set of price rules.

Cashier repeats steps 3-4 until indicates done.

1. System presents total with taxes calculated.
2. Cashier tells Customer the total, and asks for payment.
3. Customer pays and System handles payment.
4. System logs completed sale and sends sale and payment information to the external Accounting system (for accounting and commissions) and Inventory system (to update inventory).
5. System presents receipt.
6. Customer leaves with receipt and goods (if any).

**Extensions (or Alternative Flows):**

\*a. At any time, Manager requests an override operation:

1. System enters Manager-authorized mode.
2. Manager or Cashier performs one Manager-mode operation. e.g., cash balance change, resume a suspended sale on another register, void a sale, etc.
3. System reverts to Cashier-authorized mode.

\*b. At any time, System fails:

To support recovery and correct accounting, ensure all transaction sensitive state and events can be recovered from any step of the scenario.

1. Cashier restarts System, logs in, and requests recovery of prior state.
2. System reconstructs prior state.

2a. System detects anomalies preventing recovery:

* 1. System signals error to the Cashier, records the error, and enters a clean state.
  2. Cashier starts a new sale.

1a. Customer or Manager indicate to resume a suspended sale.

1. Cashier performs resume operation, and enters the ID to retrieve the sale.
2. System displays the state of the resumed sale, with subtotal.

2a. Sale not found.

* 1. System signals error to the Cashier.
  2. Cashier probably starts new sale and re-enters all items.

1. Cashier continues with sale (probably entering more items or handling payment).

**Special Requirements:**

- Touch screen UI on a large flat panel monitor. Text must be visible from 1 meter.

- Credit authorization response within 30 seconds 90% of the time.

- Somehow, we want robust recovery when access to remote services such the inventory system is failing.

- Language internationalization on the text displayed.

- Pluggable business rules to be insertable at steps 3 and 7.

- …

**Technology and Data Variations List**:

\*a. Manager override entered by swiping an override card through a card reader, or entering an authorization code via the keyboard.

3a. Item identifier entered by bar code laser scanner (if bar code is present) or keyboard.

3b. Item identifier may be any UPC, EAN, JAN, or SKU coding scheme.

7a. Credit account information entered by card reader or keyboard.

7b. Credit payment signature captured on paper receipt. But within two years, we predict many customers will want digital signature capture.

Frequency of Occurrence: Could be nearly continuous.

**Open Issues:**

- What are the tax law variations?

- Explore the remote service recovery issue.

- What customization is needed for different businesses?

- Must a cashier take their cash drawer when they log out?

- Can the customer directly use the card reader, or does the cashier have to do it?

### Student Name 4 (Registration Number 1)

| Use Case UC1: Process Sale |
| --- |
| **Scope**: NextGen POS application  **Level**: user goal  **Primary** **Actor**: Cashier  **Stakeholders and Interests**:  - Cashier: Wants accurate, fast entry, and no payment errors, as cash drawer shortages are deducted from his/her salary.  - Salesperson: Wants sales commissions updated.  - Customer: Wants purchase and fast service with minimal effort. Wants easily visible display of entered items and prices. Wants proof of purchase to support returns.  - Company: Wants to accurately record transactions and satisfy customer interests. Wants to ensure that Payment Authorization Service payment receivables are recorded. Wants some fault tolerance to allow sales capture even if server components (e.g., remote credit validation) are unavailable. Wants automatic and fast update of accounting and inventory.  - Manager: Wants to be able to quickly perform override operations, and easily debug Cashier problems.  - Government Tax Agencies: Want to collect tax from every sale. May be multiple agencies, such as national, state, and county.  - Payment Authorization Service: Wants to receive digital authorization requests in the correct format and protocol. Wants to accurately account for their payables to the store.  **Preconditions**: Cashier is identified and authenticated. |

**Success Guarantee** (or Postconditions): Sale is saved. Tax is correctly calculated. Accounting and Inventory are updated. Commissions recorded. Receipt is generated. Payment authorization approvals are recorded.

**Main Success Scenario (or Basic Flow):**

1. Customer arrives at POS checkout with goods and/or services to purchase.
2. Cashier starts a new sale.
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4. System records sale line item and presents item description, price, and running total. Price calculated from a set of price rules.

Cashier repeats steps 3-4 until indicates done.

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5. System presents receipt.
6. Customer leaves with receipt and goods (if any).

**Extensions (or Alternative Flows):**

\*a. At any time, Manager requests an override operation:

1. System enters Manager-authorized mode.
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1a. Customer or Manager indicate to resume a suspended sale.

1. Cashier performs resume operation, and enters the ID to retrieve the sale.
2. System displays the state of the resumed sale, with subtotal.

2a. Sale not found.

* 1. System signals error to the Cashier.
  2. Cashier probably starts new sale and re-enters all items.

1. Cashier continues with sale (probably entering more items or handling payment).

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Frequency of Occurrence: Could be nearly continuous.

**Open Issues:**

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- Explore the remote service recovery issue.

- What customization is needed for different businesses?

- Must a cashier take their cash drawer when they log out?

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### Student Name 5 (Registration Number 1)

| Use Case UC1: Process Sale |
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**Success Guarantee** (or Postconditions): Sale is saved. Tax is correctly calculated. Accounting and Inventory are updated. Commissions recorded. Receipt is generated. Payment authorization approvals are recorded.

**Main Success Scenario (or Basic Flow):**

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6. Customer leaves with receipt and goods (if any).

**Extensions (or Alternative Flows):**

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2. Cashier starts a new sale.
3. Cashier enters item identifier.
4. System records sale line item and presents item description, price, and running total. Price calculated from a set of price rules.

Cashier repeats steps 3-4 until indicates done.

1. System presents total with taxes calculated.
2. Cashier tells Customer the total, and asks for payment.
3. Customer pays and System handles payment.
4. System logs completed sale and sends sale and payment information to the external Accounting system (for accounting and commissions) and Inventory system (to update inventory).
5. System presents receipt.
6. Customer leaves with receipt and goods (if any).

**Extensions (or Alternative Flows):**

\*a. At any time, Manager requests an override operation:

1. System enters Manager-authorized mode.
2. Manager or Cashier performs one Manager-mode operation. e.g., cash balance change, resume a suspended sale on another register, void a sale, etc.
3. System reverts to Cashier-authorized mode.

\*b. At any time, System fails:

To support recovery and correct accounting, ensure all transaction sensitive state and events can be recovered from any step of the scenario.

1. Cashier restarts System, logs in, and requests recovery of prior state.
2. System reconstructs prior state.

2a. System detects anomalies preventing recovery:

* 1. System signals error to the Cashier, records the error, and enters a clean state.
  2. Cashier starts a new sale.

1a. Customer or Manager indicate to resume a suspended sale.

1. Cashier performs resume operation, and enters the ID to retrieve the sale.
2. System displays the state of the resumed sale, with subtotal.

2a. Sale not found.

* 1. System signals error to the Cashier.
  2. Cashier probably starts new sale and re-enters all items.

1. Cashier continues with sale (probably entering more items or handling payment).

**Special Requirements:**

- Touch screen UI on a large flat panel monitor. Text must be visible from 1 meter.

- Credit authorization response within 30 seconds 90% of the time.

- Somehow, we want robust recovery when access to remote services such the inventory system is failing.

- Language internationalization on the text displayed.

- Pluggable business rules to be insertable at steps 3 and 7.

- …

**Technology and Data Variations List**:

\*a. Manager override entered by swiping an override card through a card reader, or entering an authorization code via the keyboard.

3a. Item identifier entered by bar code laser scanner (if bar code is present) or keyboard.

3b. Item identifier may be any UPC, EAN, JAN, or SKU coding scheme.

7a. Credit account information entered by card reader or keyboard.

7b. Credit payment signature captured on paper receipt. But within two years, we predict many customers will want digital signature capture.

Frequency of Occurrence: Could be nearly continuous.

**Open Issues:**

- What are the tax law variations?

- Explore the remote service recovery issue.

- What customization is needed for different businesses?

- Must a cashier take their cash drawer when they log out?

- Can the customer directly use the card reader, or does the cashier have to do it?

### Student Name 8 (Registration Number 1)

| Use Case UC1: Process Sale |
| --- |
| **Scope**: NextGen POS application  **Level**: user goal  **Primary** **Actor**: Cashier  **Stakeholders and Interests**:  - Cashier: Wants accurate, fast entry, and no payment errors, as cash drawer shortages are deducted from his/her salary.  - Salesperson: Wants sales commissions updated.  - Customer: Wants purchase and fast service with minimal effort. Wants easily visible display of entered items and prices. Wants proof of purchase to support returns.  - Company: Wants to accurately record transactions and satisfy customer interests. Wants to ensure that Payment Authorization Service payment receivables are recorded. Wants some fault tolerance to allow sales capture even if server components (e.g., remote credit validation) are unavailable. Wants automatic and fast update of accounting and inventory.  - Manager: Wants to be able to quickly perform override operations, and easily debug Cashier problems.  - Government Tax Agencies: Want to collect tax from every sale. May be multiple agencies, such as national, state, and county.  - Payment Authorization Service: Wants to receive digital authorization requests in the correct format and protocol. Wants to accurately account for their payables to the store.  **Preconditions**: Cashier is identified and authenticated. |

**Success Guarantee** (or Postconditions): Sale is saved. Tax is correctly calculated. Accounting and Inventory are updated. Commissions recorded. Receipt is generated. Payment authorization approvals are recorded.

**Main Success Scenario (or Basic Flow):**

1. Customer arrives at POS checkout with goods and/or services to purchase.
2. Cashier starts a new sale.
3. Cashier enters item identifier.
4. System records sale line item and presents item description, price, and running total. Price calculated from a set of price rules.

Cashier repeats steps 3-4 until indicates done.

1. System presents total with taxes calculated.
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**Screen Shots:**

**For Group Leader:**

<Paste the images from netbeans here for the relevant screen

NOTE :only one image against project should be inserted