Software Requirement Specification

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Course Project : Inventory Management Application with focus on institute sports complex

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0.Preface

The purpose of this document is to provide a complete description of the working of the inventory Management application. It will include assumptions, requirements, and system constraints. This document is meant mainly for the developers and designers of the application . The stakeholders - sports society administration or hostel administration who might use this application -may also refer and review this document.

1. Introduction:

1.1 Problem Specification
Currently, in our and many other institutes, issuing of sports equipment by students is done manually and details are stored in registers. There is no automation in the process which leads to inefficiencies. Students sometimes bypass and do not register themselves before issuing or guards misplace the registers storing the issuing details. Also, no strict action is taken for damaging/misplacing equipment. Availability of a secured sports inventory management software would allow automating tasks like adding dues if returned late or fine if the equipment is damaged, fast retrieval of information like inventory details, issuing details, and adding features like allow issuing only if students have no dues

1.2 Scope of Project and overall description

Intended users : This software can be used by any institute to manage the sports items or any item in general. The software can also be used for managing the Sports Complex of the institute which is currently under construction. Any sports facilities like training centers , gymnasiums ,stadiums ,sports societies, universities might also use the application

Intended use: This project aims to automate the process of issuing/returning and check availability of items from inventory , monitoring student dues or damaged items and keeping a record of inventory items used by sports facilities such as training centers, gymnasiums, stadiums, sports federations,universities or hostels.

Overall description: Students can check the availability of the equipment and issue item accordingly . If the item is not available ,software will not allow issuing . Students can submit any equipment he/she is possessing through the software, software will update the equipment availability accordingly so as to make equipment available for other students and also software would automatically apply dues to the student accordingly if return date is passed. Student can also pay dues (if any)to the security and the security will update his dues in the database .

Also , any process that requires update of the database like issuing , returning and paying dues would ask for a security username and password given to the security people . This ensures student can only view his dues and check availability of items and can also change database under the surveillance of a security person

1.3 Constraints

a. No student can possess more than five pieces of equipment at the same time.
b. No student can issue a piece of equipment till his previous dues are cleared.
c. No student can possess more than one piece of equipment of the same category.

1.4 Assumptions

a) A security worker is always present at the inventory.
b) Every student is given a username and password by the Institute already.
c) A permanent system is allotted in the sports room.
d) All the students follow the rules.
f) Secretary or admin is also given rights of other normal students in addition to some extra rights.
g) security worker is already given a password to verify every process.
h) Every Equipment is issued till next day 23:59
i) Equipment of the already available category can only be added by the secretary.

1.5 Definitions, Acronyms, and Abbreviations

Term	Definition
Student	The person who is studying at campus and wishes to use desired sports equipment.
Secretary/admin	The student-elected sports authority./administration
Security Worker	A person is present all the time at the inventory to take care of sports equipment.
Security worker	Security person present at the inventory..

2.Functional Requirements

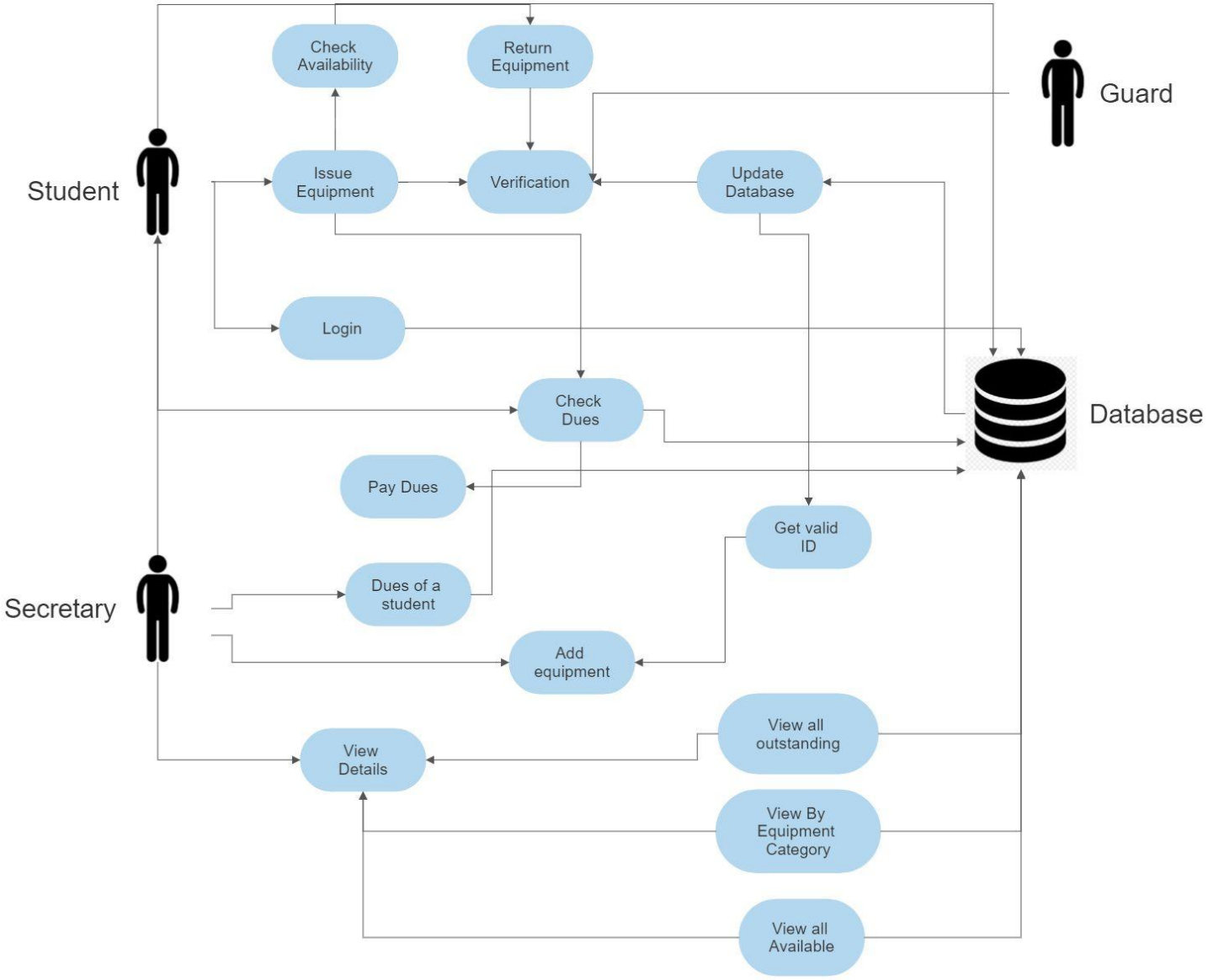
This section contains the requirements defining the functionality and features the application is expected to fulfill. These requirements are then refined into use case descriptions to best capture the functional requirements of the system.

2.1 User Characteristics /user Scenarios

The Application homepage provides 2 login options : one for students and other for the admin which may be the hostel secretary or the sports secretary.

1. The students login allow them to issue/return equipment, check equipment availability and check/pay dues. Issue equipment /return equipment / pay dues can only be done in the main system under the surveillance of a security worker with a security password as it involves changes in the database.
2. The secretary /admin login allows access to the software either for checking availability of products in the inventory or to check what items are issued and to whom and how much fine is pending for each student .
3. Security: In addition to both these users there is one more security person who will also interact with the system to securely facilitate all processes.

2.2 Workflow



User Case Diagram

2.3 Use Case Description

1. Student / Admin Login

Use Case Name	Student/ Admin Login
User	Admin or Student
Precondition	1. Student database containing student username and password 2.Username and password entered should be correct
Basic Path	1.click for Student/admin Login. 2.Enter username and password carefully. 3.Click confirm
Post condition	Student Is now logged in system and can access other features

2. Issue Equipment

Use Case Name	Issue Equipment
User	Student only
Precondition	1.Total fine on students should be zero. 2.Item should be available in the inventory.
Basic Path	1.First login into the system. 2.Check availability of equipment in inventory. 3.Select equipment and get confirmation password .
Post condition	He/She can issue a maximum of 5 equipment, 1 of each category.

3. **Return Equipment**

Use Case Name	Return Equipment
User	Student only

Precondition	1.Equipments should be issued on the name of that student only which is logged in into the system.
Basic Path	1.First login into the system. 2.Click on Return Equipment and enter Id's of equipment you want to return. 3.Get final confirmation password of guard and deposit equipment to guard.
Post condition	Dues are automatically added accordingly if return date is passed

4. Check Dues

Use Case Name	Check Dues
User	Student only
Precondition	1.Student can check their own dues only.
Basic Path	1.First login into the system. 2.Click Check Dues

5. Pay Dues

Use Case Name	Pay Dues
User	Student only
Precondition	1.Total fine on students should be non-zero. 2.Student can pay his/her dues only.
Basic Path	1.First login into the system. 2.Go for Check Dues. 3.If dues are non zero go for Pay Dues. 4. After paying cash to the guard , guard will enter the security password to update the dues of the student
Post condition	Only after paying Dues he/she go for issue.

6. **Check dues by admin / secretary**

Use Case Name	Dues of a student
User	Secretary/Admin only
Precondition	1.Secretary should have a roll number of concerned students.

Basic Path	1.Firstly the secretary should login into the system. 2.click on check Dues of a student. 3. Enter the roll number of the student.
Post condition	Secretary can take appropriate action if any.

7. Verification

Use Case Name	Verification
User	security person only
Precondition	1.If a person wants to issue or return or pay his dues for some equipment. 2.Database should be updated.
Basic Path	1.Firstly a person should complete the process of issue/return/pay dues. 2.Then security person will enter his/her password to complete the process.
Post condition	Process of issue/return/pay dues gets completed.

8. Check Availability

Use Case Name	Check Availability
User	student only
Precondition	1.If a person wants to issue some equipment.
Basic Path	1.Firstly a person should log in into the system and go for issue equipment. 2.Then availability of desired products are checked in the inventory.
Post condition	Feasibility of the process of issuing gets confirmed.

9. View Details

Use Case Name	View Details
User	secretary/admin only
Basic Path	1.First secretary must be logged in into the system. 2. Then click on View Details.

Post condition	Secretary can view all details of equipment regarding which are issued or present.

10. View Equipment By Category

Use Case Name	View by Equipment Category
User	secretary/Admin only
Precondition	1.Secretary should go into view details.
Basic Path	1.First follow the basic path for view details. 2.Then click View Inventory Products. 3.Then List of all available products in inventory are extracted from the database and shown.
Post condition	Secretary can check if any product is present in fewer or in excess amounts than desired.

11. View all available

Use Case Name	View All Available

User	secretary/Admin only
Precondition	1.Secretary should go into view details.
Basic Path	1.First follow the basic path for view details. 2. Click on View Equipment Availability. 3.Then List of all equipment of that category(available as well as issued) are counted and listed down.
Post condition	Secretary can check if any product is present in fewer or in excess amounts than desired.

12. View All Issued

Use Case Name	View all Issued Items
User	secretary/Admin only
Precondition	1.Secretary should be logged in into the system. 2.Secretary should go into view details.

Basic Path	1.First follow the basic path for view details. 2. Click on View Issued Items. 3.Then List of all Issued items with due dates and holder's details etc. gets printed.
Post condition	Secretary can check due dates for some particular products that may be on some particular student.

13. Add/Remove Equipment

Use Case Name	Add Equipment
User	secretary only
Precondition	1.Secretory should go into add/Remove equipment.
Basic Path	1.First follow the basic path Secretary Login. 2. Click adding equipment. 3.Then List of all category products gets printed. 4.Enter Id of one which needs to be added. 5. Enter quantity needs to be added.
Post condition	Desired equipment in desired quantity gets added to inventory.

3. Interface Requirements

3.1 User Interfaces

- User Interface of the application is a terminal based user interface in the form of a c++ executable program made with cmake
- user will be shown at every step, a list of numbers in the terminal that the user can input from keyboard and the functionality that the each input leads to .
- For example - on running the executable file in terminal , three options are shown

  Press 1 : student login
  Press 2 : admin login
  Press 3 : exit application .

  On pressing 1 , user enters username and password if it matches a new list of numbers is shown like

  Press 1 : Issue item
  Press 2 : return item
  Press 3 : Pay dues

3.2 Hardware Interfaces

- Keyboard : Input devices for interaction with the application
- Video Display Unit(VDU): For displaying the application in terminal
- Any terminal system : linux or any wsl like ubuntu for windows
- RAM /ROM: Just a few megabyte ram and rom for smooth functioning of the program.
- Sql database cloud storage service : Memory is also required for storing the databases on cloud servers like amazon web services ,google cloud etc. In our application we have used free cloud service which provides limited memory storage of 100 mn : freesqldatabase.com
- Internet Hardware: Since the application requires internet to connect to cloud server database, hardware shall be required to connect to the internet. As for e.g. Modem, WAN – LAN, Ethernet Cross-Cable.

3.3 Software Interfaces

- The software interacts with the operating system and terminal system.
- The software interacts with the database which is stored on the cloud server,
- Also it uses certain other libraries like sql c api libraries for making connection between c++ program and cloud server database.

4 Performance Requirements

4.1 Response time

The application is terminal based so all it needs a terminal system which may be linux or any WSL like ubuntu for windows . Since the application would be executable file need to be runned in terminal therefore loading time would be fast . Major time would be taken whenever accessing of database from cloud server is required . This requires a internet connection and hence response time mainly depends on stability and strength of the internet connection .The performance shall slightly depend upon the hardware components of the client/customer.

4.2 Memory Requirements

- All the programming logic is dynamic, nothing as a pre-computation or saved data within the code is required, only memory for code is required which would not exceed a few Megabytes.
- Memory would also be required for storing the databases whose size would depend upon the number of students registered and size of the sports inventory.All the Database will be stored in a sql database cloud server which has upper limit in gigabytes . The application databases would not require more than 100 mb of memory for institute use and in general gigabytes of memory would be more than sufficient

- **Approxing Memory required** : For Hostel use : About 250 students are there per hostel with items categories not exceeding 30
  For Sports complex Use: About 2500-3000 students are there in College with items Categories not exceeding 50

Overall memory required for Databases would be in Megabytes and not exceed a GB.

5. Design Constraints

- Response time for loading of the application should take no longer than 5seconds. That means as soon as user types a input , fetching data from cloud server using internet and producing output should not take more than 5 second
- General knowledge of basic computer skills is required to use the product
- The computers must be equipped with a terminal system which can be linux or any WSL system like ubuntu for windows.

- The system shall provide a uniform look and feel between all the web pages. The application should be user intuitive and easy to use.

- The overall memory taken by application on the main system including the databases should not exceed 1 Gb.

6. Non Functional Requirements

The inventory Management system will work on a local computer in a sports room by interacting with a database available on the cloud server by keeping the data of details of all equipment and rules of the society and depending upon those it will allow/disallow students to issue or submit some equipment. Though students would be able to check their dues and other details on their system but they would not be able to make any changes to the database without a password which is only given to the guard/security. So , Every change in the database would not be approved without the security password.

Security :

1. Separate logins are provided for admin and student ensuring accountability ,authenticity and confidentiality of the application.
2. Before any change in the database , security password is required which ensures integrity of the application

Maintainability:

1. A active sql database cloud server to store the databases.
2. After deployment , user/client feedback is taken and new version with improvements are updated on the download link

Usability

1. The application should be user intuitive and easy to use. That is , application at every step prints a list of inputs that user can enter and what function it leads to.

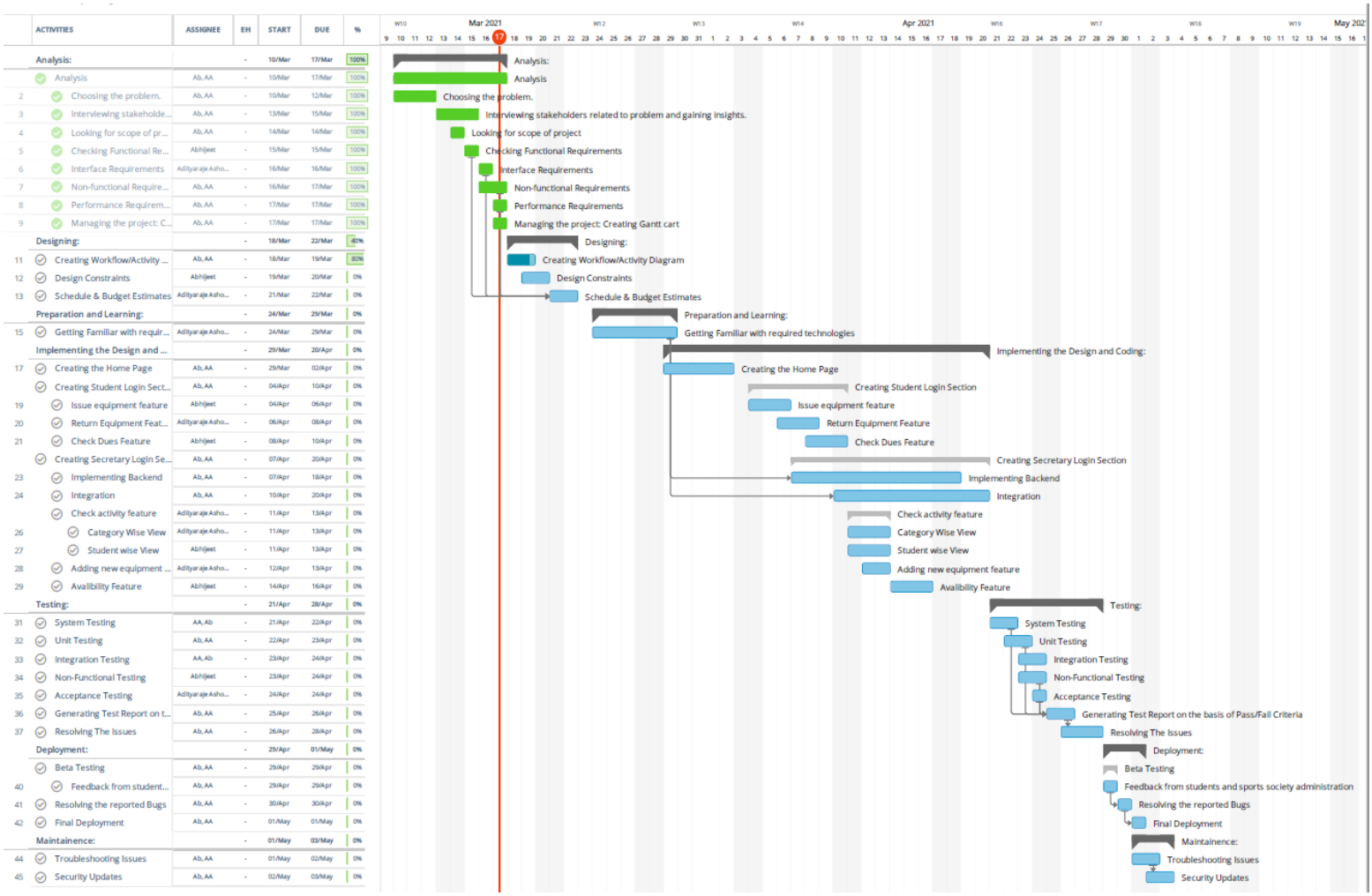
Compatibility

1. App can be run on any system with a active internet connection, terminal system like linux or wsl like ubuntu in windows while the main system should also have few megabytes of ROM and RAM with sql c api for connection between database and c application , cmake for building the executable from the c/c++ modules. If the executable is already build , no sql c api and cmake is required

7.Schedule and budget estimates:

The schedule is given above in the form of a gantt chart .

The main budget comprises the payment given to the developers of the application and the cost of hosting the database on a cloud server
Approximate Cost of Hosting: Rs 300-500 per year per gb of storage
However since the application is used only on the institute , therefore it would not require more than 100 mb for current situation and 1 gb taking into account future considerations .



Estimated payment of each member:

1.C++/C Developer: 10000

2.Database Developer: 13000

3.Senior Web Developer: 15000

4.Testing Manager: 12000

5.Quality Assurance engineer: 10000