Software Requirements Specification

for

Gymkhana Sports Management System

Version 2.0 approved

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6th March, 2019

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Revision History

Name	Date	Reason For Changes	Version
Version 1	**06/03/19**	**Initial SRS**	**1.0**
Version 2	**13/03/19**	**Modified based on feedback**	**2.0**

1. Introduction

1.1 Purpose

The purpose of this project is to manage the registrations and payments for the membership of various sports and activities organized by Gymkhana. As the students and the faculties who use the sports facilities offered by the Gymkhana have to go to the Gymkhana office to inquire about the free slots, the project aims to simplify the process by displaying the number of vacancies in each slot and also facilitating the payment process for the membership.

1.2 Document Conventions

DB – Database
SQL – Structured Query Language
SRS – Software Requirement Specifications
Gymkhana – The organization responsible for managing sports, technical and cultural activities of the campus.

1.3 Intended Audience and Reading Suggestions

This project is a prototype for the Gymkhana sports management system and it is restricted within the college premises. This has been implemented by college students under the guidance of college professors. This project will be useful for the students and professors engaging in various sports activities under the Gymkhana.

The main functional requirements are listed in Section 4 and its summary is listed in Section 2.2. For a detailed description of the project, the user is recommend to read the entire SRS in an orderly fashion.

1.4 Product Scope

There are various activities and sports such as badminton, swimming , gymnasium , pool , etc. conducted and managed by Gymkhana , IIT Kharagpur. This project is aimed to help keep track of all records like vacant slots and positions for the benefit of student and professors who are willing to engage in these activities. It also aims to facilitate the payment process for the membership.

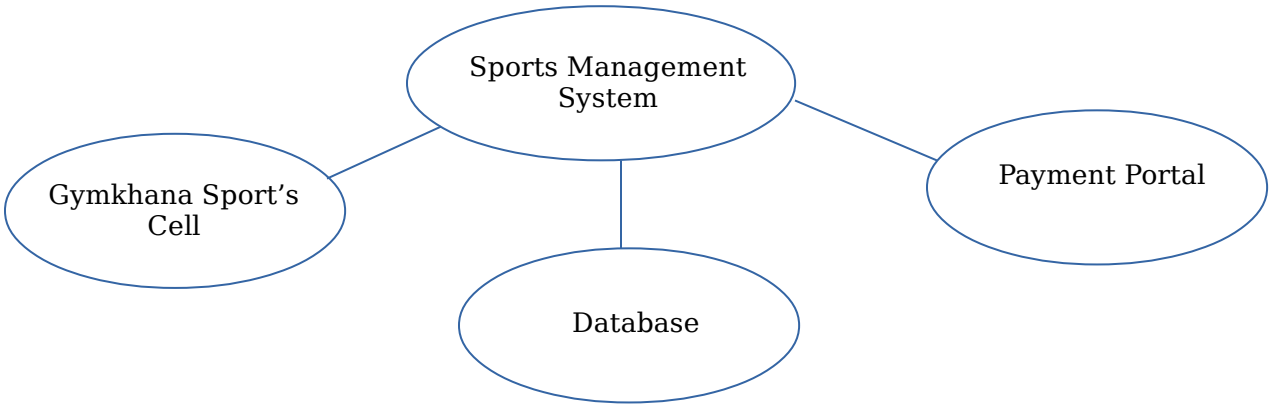
1.5 References

- *Fundamentals of database systems by* Ramez Elmarsi *and* Shamkant B Navathe
- https://www.geeksforgeeks.org/socket-programming-in-java/
- https://www.javatpoint.com/java-swing

2. Overall Description

2.1 Product Perspective

This project is a new self contained product which interacts with Gymkhana's sports management cell.



The sports management system interacts with the Gymkhana Sport's Cell for updating those slots that have been manually booked. It uses a database to look up the vacancies in each slot for the corresponding activity. It also calls the payment portal for initiating online payment process for booking the membership.

2.2 Product Functions

- It shows the availability of slots for the various activities under the Gymkhana.
- The relevant information is updated when the slots are booked through other means.
- It helps in the booking of the available slots according to the user's interests by providing an interface for booking and making payments.

2.3 User Classes and Characteristics

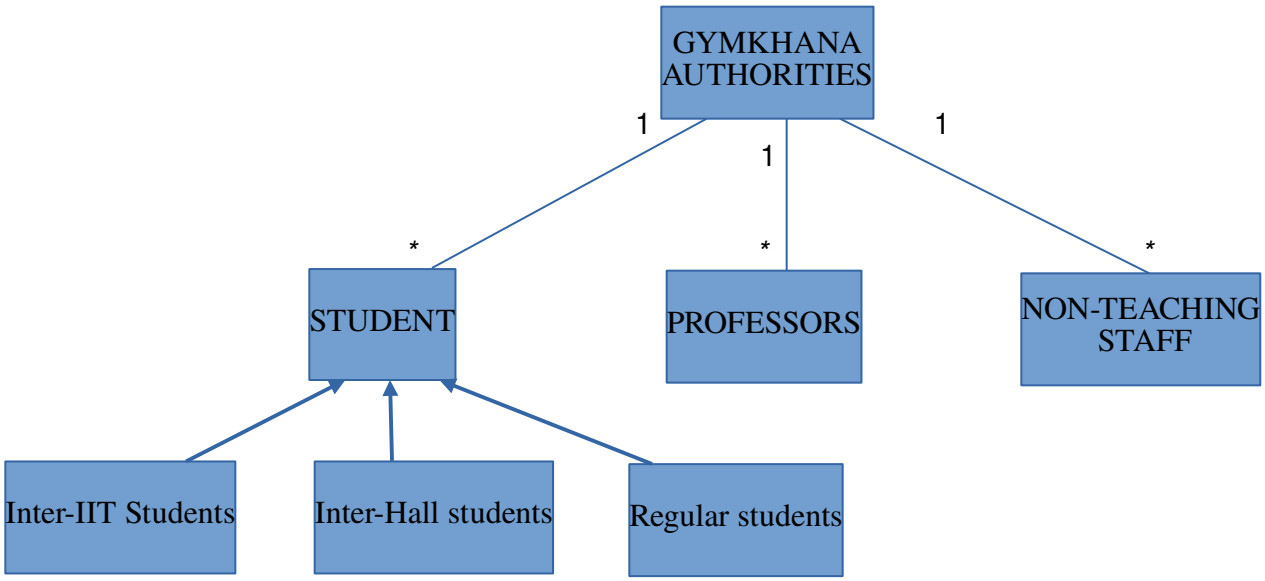
- **Students**

  i. **Inter-IIT Students --** These are the students who take part regularly in Inter IIT Sports Championship and show much more regularly for practice with a very high level of expertise in their corresponding sport.
  ii. **Sports GC Students –** These students take part in the Inter Hall Sports Championship and show up regularly for practice and have a decent level of expertise in their corresponding sport.
  iii. **Regular Students –** These are the students who do not have any particular experience in the corresponding sport but are interested in taking part in it.

- **Professors –** They are the professors and management staff of IIT Kharagpur who are interested in engaging in a particular sports activity.

- **Non – Teaching Staff –** They are the non – teaching staff with a lesser technical expertise that can limit their interface with the system.

- **Gymkhana Authorities –** The management staff of the Gymkhana will use this software to update the database in case of manual registrations. They have a higher level of security access.



2.4 Operating Environment

- Operating System: Linux
- Database: SQL
- Platform: Java
- Server/Client System
- Hardware Platform: Intel i5 Processor, 4GB Ram, 10GB Storage Space

2.5 Design and Implementation Constraints

- Gymkhana gives only restricted access to its internal data which restricts further development options.
- SQL with Java interface hasn't developed a lot.
- Not all types of online payments are accepted by Gymkhana.
- Non-teaching staff's technical expertise has to be taken into account.

2.6 Assumptions and Dependencies

The system assumes the person can't cancel his membership before his period expires. It also assumes the shift from manual to automated system will be smooth without any hitches. Further,

it depends on the fact that nobody tries to interfere with the database and we have enough space to store all the data.

This project depends on the online payment portal system and the SQL database software. It is also heavily dependent on the local network of the campus for the client server interface.

3. External Interface Requirements

3.1 User Interfaces

- **Slots checking and booking –** This is managed by the GUI created by the Java Swing Library. It will provide an user friendly environment for the users to interact with the system for checking and booking the available slots.
- **Slots updating -** This is also managed by the GUI created by the Java Swing Library where the corresponding user with access will update the database regarding change in slot details.
- **Payment Portal –** This is manged by the online payment portal software developed by SBI which is used to make payments for the membership.

3.2 Hardware Interfaces

- **Server side –** The database interacts with a physical storage device.
- **Client side –** Any device with a browser and internet connection can interact with the software.

3.3 Software Interfaces

Software used	Description
Operating system	We have chosen Linux operating system for its best support for development and user-friendliness.
Database	To save the slots and membership records, we have chosen SQL database.
GUI	To implement the user-friendly interface, we used the Java Swing Library for GUI rendering.
Payment Portal	To facilitate the payment process, we used the online payment portal developed by SBI.

3.4 Communications Interfaces

This project supports all types of web browsers and it requires HTTP/HTTPS protocol for client server communications.

4. System Features

4.1 Check slot availability

4.1.1 Description and Priority

This feature is responsible for checking the availability of various slots for the corresponding activity by checking it with the database. Its a high priority and high benefit feature because this is the primary objective of the software. It is also a medium cost feature.

4.1.2 Stimulus/Response Sequences

When the user requests the availability of a slot for a particular sport, this feature looks up the corresponding field in the database and displays the available vacancies for that slot.

4.1.3 Functional Requirements

REQ-1: A drop-down menu showing the list of activities.
REQ-2: When, the user chooses the activity of their choice, all the available slots with the number of vacancies should be displayed.
REQ-3: It should have a "BOOK" option next to the slots which when clicked calls the "Book and Pay for membership" feature.

4.2 Update slot availability

4.2.1 Description and Priority

This feature is responsible for updating the database when a user books a slot either through the software or through manual means. Its a high priority and high benefit feature because this maintains the system integrity so that it can provide an accurate information.

4.2.2 Stimulus/Response Sequences

When the user books a slot through the software or through manual means, this feature is triggered so that it can modify the respective field in the database.

4.2.3 Functional Requirements

REQ-1: It has to provide an interface for authentication of Gymkhana staffs.
REQ-2: If incorrect details are provided, it should show an error message.
REQ-3: If correct details are provided, it should show a drop down list listing all the activities.
REQ-4: After the user chooses the activity, all its slot details are shown with an "UPDATE" button next to it.
REQ-5: The user should be able to update the slot information in the database after pressing the button in the database.
REQ-6: It should also have an option for logging out when logged in.
REQ-7: When the "Book and pay for membership" feature calls this feature with the details, it should update the database accordingly.

4.3 Book and pay for membership

4.3.1 Description and Priority

This feature takes care of booking the slots and allotting membership to the us higher in his corresponding sport by accepting payments through an online portal. Its a medium priority with high benefits and a high risk factor.

4.3.2 Stimulus/Response Sequences

When the user requests the booking of a slot through the software, this feature is triggered. This then redirects the user to the online payment portal for making the payment. Once the payment is successful, it then calls the "Update slot availability" feature to update the database and confirms the registration.

4.3.3 Functional Requirements

REQ-1: When this is called by the 'Check slot availability" feature, it should be able to get the corresponding activity and slot details from the "Check slot availability".

REQ-2: Then it should call a GUI for getting the personal details of the user with a "PAY" button.

REQ-3: When the "PAY" button is pressed, it should initiate the payment process by redirecting to the payment portal.

REQ-4: If the payment process is successful, it should call the "Update slot availability" with the corresponding details.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The entire process has to be fast and smooth as otherwise it defeats the purpose of the software.
- The slot availability has to updated regularly at an high frequency so that users are not fed inconsistent information.
- The software - database interaction needs to be very smooth so as to maintain the above performance requirements.

5.2 Safety and Security Requirements

- The interaction with the payment portal has to be treated with a high risk factor as the data transferred in this step is extremely important that can be subjected to a middle-man interference leading to disastrous consequences.
- Also, the database has to be designed in such a way that external factors should not be able to access and modify the data.

5.3 Software Quality Attributes

- The product has to be user friendly as non-technical staffs also interact with the software.
- This has to be maintainable as this will be used for a long period of time.

- This software also has to be available at all points of time as the user can check and book slots at any time.
- The system also has to provide correct information and must be verifiable.
- The project has to be portable as it can be transferred to another system easily in case of system crashes.

Appendix A: Glossary

- **DB –** DB stands for database. It is a structured set of data held in a computer, especially one that is accessible in various ways.
- **SQL –** SQL is an abbreviation for structured query language, and pronounced either see-kwell or as separate letters. SQL is a standardized query language for requesting information from a database.
- **Protocol** - A specific method in which messages are formulated, formatted, and passed between computers in a network. Internet messages are passed between computers using the TCP/IP protocol.
- **Process** - An instance of the execution of a program on a single computer. A process can consist of one or more threads executing, more or less, concurrently. The private memory used by a process cannot be accessed by any other process.

Appendix B: Analysis Models

Data Flow Diagram