



Web based Gym Management System

**A dissertation submitted for the Degree of Master of
Information Technology**

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Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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This is to certify that this thesis is based on the work of Mr. K G S T Gamage, under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

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Abstract

In these modern days people have become so much concerned about their health and diet; it is but obviously that they seek out for gym. The system is developed for Muscle Power Gym situated at Godagama, Homagama. Gym is equipped with all the modern machineries and other supportive items to provide a better service to its customers. So the numbers of members are tent to increase day by day and Gym Management has decided to go for an IT solution in order to handle the increased volumes.

Development was carried out after identifying the user requirements by using different data gathering technics to ensure clarity of the requirements. Based on the requirements software was designed and developed in iterative and incremental development method.

Software is developed with the aim of replacing the current manual system which was using at the Gym. The system supposed to provide easy access of the resources of the gym to its members while empowering the management process of the gym. Following major functionalities such as member management, attendance management, charges management, maintenance management and reports generation were identified. Access control was achieved with the user name and password. User access levels were also implemented to control the accessibility of the system.

The system has the capability of suggesting the best workout schedules that suit to the members while keeping the harm full workouts away depending on the members' physical condition. The system also capable of notifying the delayed payments and pending services of exercise machines. High level of customization is embedded in to the system where administrator can control the access and appearance of the system. System is developed as a web based application, so the accessibility is high around the world.

System was developed with PHP, apache, MySQL. Xamp framework was used for the development. Adobe Dream viewer CS 6 was used as the editing tool throughout.

Final product is tested thoroughly and delivered to the end user on agreed date

Currently the system is on live in Muscle power gym at Godagama and the system is used by the members and the administration in a satisfied manner.

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1: Introduction

This report is an outcome of Master of Information Technology program being conducted by University of Colombo School of Computing. The project proposal was submitted as per the instructions and guidance of the Supervisor. Client was selected solely based on the type of the business to match with the desired software application.

Physical fitness is very necessary for a healthy and tension free life. Physical fitness includes diet, exercise and sleep. These three basic things have their own importance in each individual's life and everyone should be sensible with regard to these for a healthy life. Therefore the tendency of going to a gym has been increased and following facts can be identified as the reasons.

Most of the foods that consume today are having High rate of calories, fat, sugar and carbohydrates. Though high rate of calories are consumed, life style of the modern world has a very low rate of burning of calories. Ultimately people tend to go to a gym to do their exercise and burn the calories.

1.1 Overview of Project

“Muscle Power ” is a well reputed gym located in Godagama, Homagama. It is conducting its’ operations with two more branches located at Kaduwela and Bomiriya. Business is well established for about 10 years and carrying out the business in a professional manner. Also the trainers are well experienced in the field for many years, So the gym has been able to attract large number of members irrespective of age, social status or gender.

1.2 Existing System

Existing system refers to the system that is being followed till now. Presently all the Functionalities are done manually.

Some of the Job functionalities in Manual system are depicted bellow.

- Registration of members and staff
- Mark attendance
- Payments

- Assigning supervisors
- Scheduling
- Record keeping
- Exercise machine maintenance.

1.3 Drawbacks of Existing System

- a. Time consuming.

Due to manual process, existing system has become very time consuming and inaccurate. Further lot of man power is used by the system

- b. Updating and Retrieval tasks are very tedious.

Since the records are kept at the registers, record keeping and retrieval have become more time consuming.

- c. Highly error prone.

Identification and rectifying of errors is difficult

- d. Easy Customer service is difficult.

This is due to high time consuming process and manual work

- e. Lot of paper work results delays and errors.

Most of the records are entered in to registers. So data redundancy is common and records are not accurate.

1.4 Proposed System

To overcome the drawbacks and to make the system working more accurately with the increasing volumes of the business, management of the gym has decided to automate the processes. The management has found following areas as the key areas that to be automated with the new system.

1. Member registration
2. Payments by the members
3. Effective workout management

4. Exercise machine management and maintenance.

1.5 Merits of Proposed System

The system is very simple in design which allows everybody to use the system easily. Though it is simple, system is developed in a way that can handle all its intended functionalities without exception.

Following are the basic facts that expects from the new system.

- a. Security of data
- b. Ensure data accuracy
- c. Administrator controls the entire system
- d. Minimize manual data entry
- e. Higher efficiency
- f. High effectiveness
- g. User friendly and interactive
- h. Retrieval and Updating tasks can be performed much faster and easier

Based on the system requirement, scope of the proposed system is described below graphically.

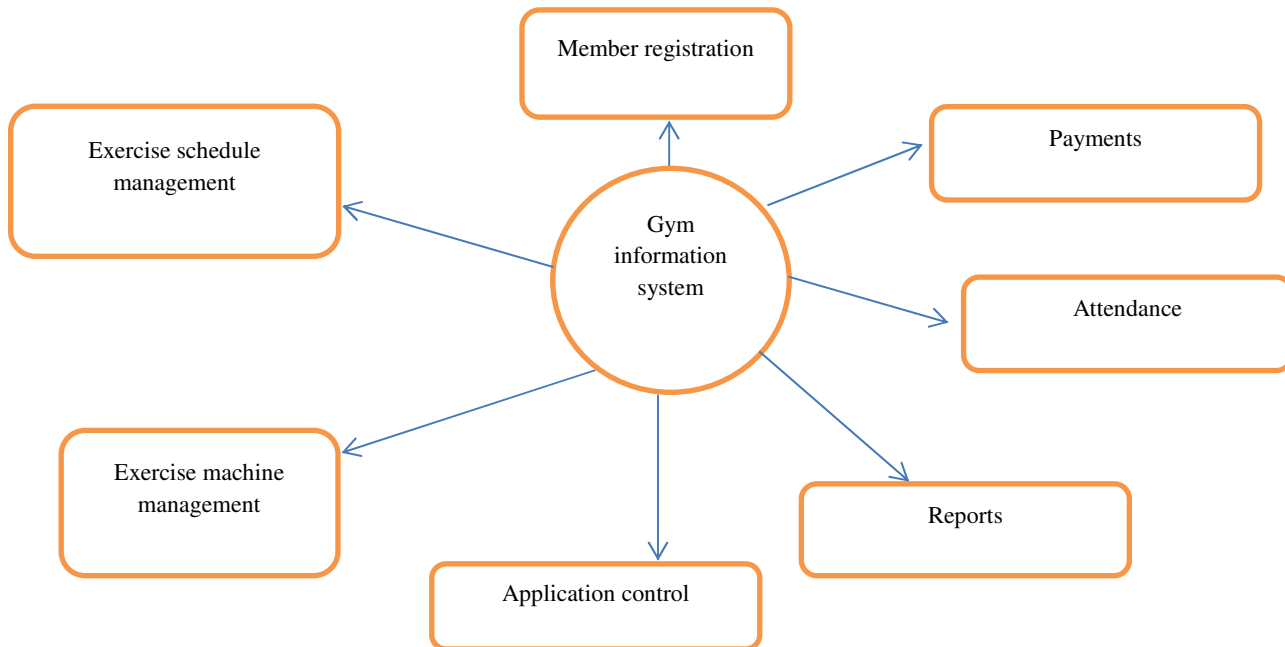


Figure 1 scope of the proposed system

1.7 Scope of the system

Gym information system can be decomposed in to 6 sub-systems in order to achieve its functionality. (Refer figure 1)

1.7.1 Member registration

Member registration sub system is designed to automate the registration process. System is designed to capture all the required information of an individual at the time of registering. Further the system is designed to avoid duplicated entries for same individual by validating the National identification number of any other identification number.(Ex: postal ID, pass port number)

1.7.2 Payments

System is designed to record the payments. This records the payment of annual fee, monthly fee and payments for thread mill. Relevant constraints are applied for the payments process.

Ex: Registration fee will be collected only once (cannot be repeated).

Modification of charges only can be performed by the administrator.

1.7.3 Attendance

This module is designed to capture and record the date and time of each member who comes to get the service of the gym. System is designed to record the time of arrival and departure of each member. Date will be stored in a database to retrieve necessary reports.

1.7.4 Exercise management

System is designed to add or modify the exercises that to be used in the gym. The data that do be fed in the system will be used in exercise schedules. System is supposed to propose the best set of exercises for each individual with the given data. Most suitable schedule of exercises is determined by an algorithm by considering each individuals health records and exercises.

1.7.5 Machine management

Machines attached to the gym are recorded. Also system will keep a track record of all the maintenance records and to be notified when a service is pending.

1.7.6 Reports

Reports used for management and daily operations will be produced.

Ex:

- Pending payments
- Payments
- Machine details
- Machine maintenance report
- Health report
- Tariff
- Current usage of the gym
- Attendance

Ability to filter reports based on certain criteria will also provide under this section. User will be having the option to print the reports.

1.7.7 Application control

Control over the application will be available under two sub categories.

Menu access control

Access level for each menu item can be controlled by the administrator without accessing the back end (source codes). Further ability to disable, enable or change the name of a menu item is enabled by the system.

User access control.

User access is controlled by user name and password. Changing the password will be provided by the system. Further user level of each user can be changed by administrator.

In next few chapters more details are given on the modules of the proposed system, design phase and the present situation of the system

1.6 Aims and objectives of the dissertation

Dissertation is prepared a way that depicts the problem domain, requirements and how the system is developed to address the problem definition. Further all the techniques and methodologies used are mentioned and explained in further chapters accordingly.

1.7 How this thesis is organized

Chapter 2: Background

Relevance of the project is explained with related to customer requirements and existing solutions in the market. Technologies used in the system were also explained here.

Chapter 3: Analysis and design/ Methodology

Fact finding methods and development methodology is explained under this chapter.

Chapter 4: Implementation

Technologies used for the development and application of technologies in system implementation is explained in this chapter.

Chapter 5: User evaluation and testing

Application of theories and technics used in user evaluation is described under this chapter. Conclusion and future works also mentioned at the end of this chapter.

Chapter 6: References

References are mentioned under this chapter

Chapter 7: Appendices

Tools used for data gathering, test plans and test cases are included under this chapter. Further system documentation is also included here with the screen shots of most important application interfaces.

2. Background

Though, Gym Management software is common in other developed countries, it is not that common in Sri Lanka. The results of the research carried out shows that even the market leaders such as Power World Gyms do not use proper software that meets its functional requirements. Further it was observed that different software was used to specific functionality. So each system works independently without collaboration.

It was found that there were few packages for automation of Gym management. All these were commercial software and sold at very high price.

Ex : Fitness Manager[1]

GymMaster[2]

Also observed that there was no sufficient customer support for those commercial applications.

Drawbacks of similar systems

Extremely expensive.

Prices for the applications are given bellow.

1.Fitness Manager

| Fitness manager | Fitness manager PLUS | Fitness manager PLUS with DAC |
|------------------------------|------------------------------|-------------------------------|
| €176 €159 | €232 €209 | €354 €319 |
| BUY NOW! | BUY NOW! | BUY NOW! |
| see features | see features | see features |

2. GymMaster

| | | |
|---|---|--|
| STUDIO USD \$ 69 per month | STANDARD USD \$ 99 per month | PROFESSIONAL USD \$ 195 per month |
| 150 Current Members* | 400 Current Members* | 1300 Current Members* |

No free versions could be downloaded. And could not find an open source solutions as well to address the scenario.

That software is very complex, so adaptation will be difficult with the skill level of the selected client. Further they do not provide enough functionalities or not providing easy configuration to suit the present scenario. And most of the time the usage of the applications are not user friendly and the user interphases are also much confusing.

(None of these vendors have provided a downloadable demo versions and only a video demos are presented.)

Therefore it was identified that, simplicity of the software, customer support and mass customization have become major concerns for software that suits the local market.

2.1 Technologies used.

PHP, Apache and Mysql were used since application is web based. CSS was used in Graphical user interface development.

Xamp framework has used throughout. Adobe dream viewer CS6 was used as the editor.

3. Analysis and Design/ Methodology.

Prior to analysis basic data gathering process was done and several data gathering techniques were used

3.1 Data gathering techniques

On site observations

Day to day operations of the gym were observed on regular basis. Cash collecting counters, registration process, work-out management, machine maintenance and record keeping were key areas that taken in to consideration.

Interviews

Interviews were conducted with members, trainers and the administrator. Interviewees were selected randomly except the trainers and the administrator. Different type of members were interviewed and could observed that different views that they were had towards IT salutation.

It was difficult to conduct face to face interview with the administrator. Most of the time interviews were conducted over the phone.

Questionnaires

Questionnaires were distributed among members and trainers. Data was collected anonymously. It was bit difficult to collect data via questionnaires, as most of the members were not submitted their feedback timely.

Documents and records

Following documents were basically studied to gather requirements.

- Member registration foam
- Cash book
- Attendance records
- Schedules
- Machine maintenance records

It was observed that data retrieval was very much time consuming and inaccurate. Further could identify the data retrieval patterns from the above mentioned documents.

Data collected by the above methods were used in data analysis and design

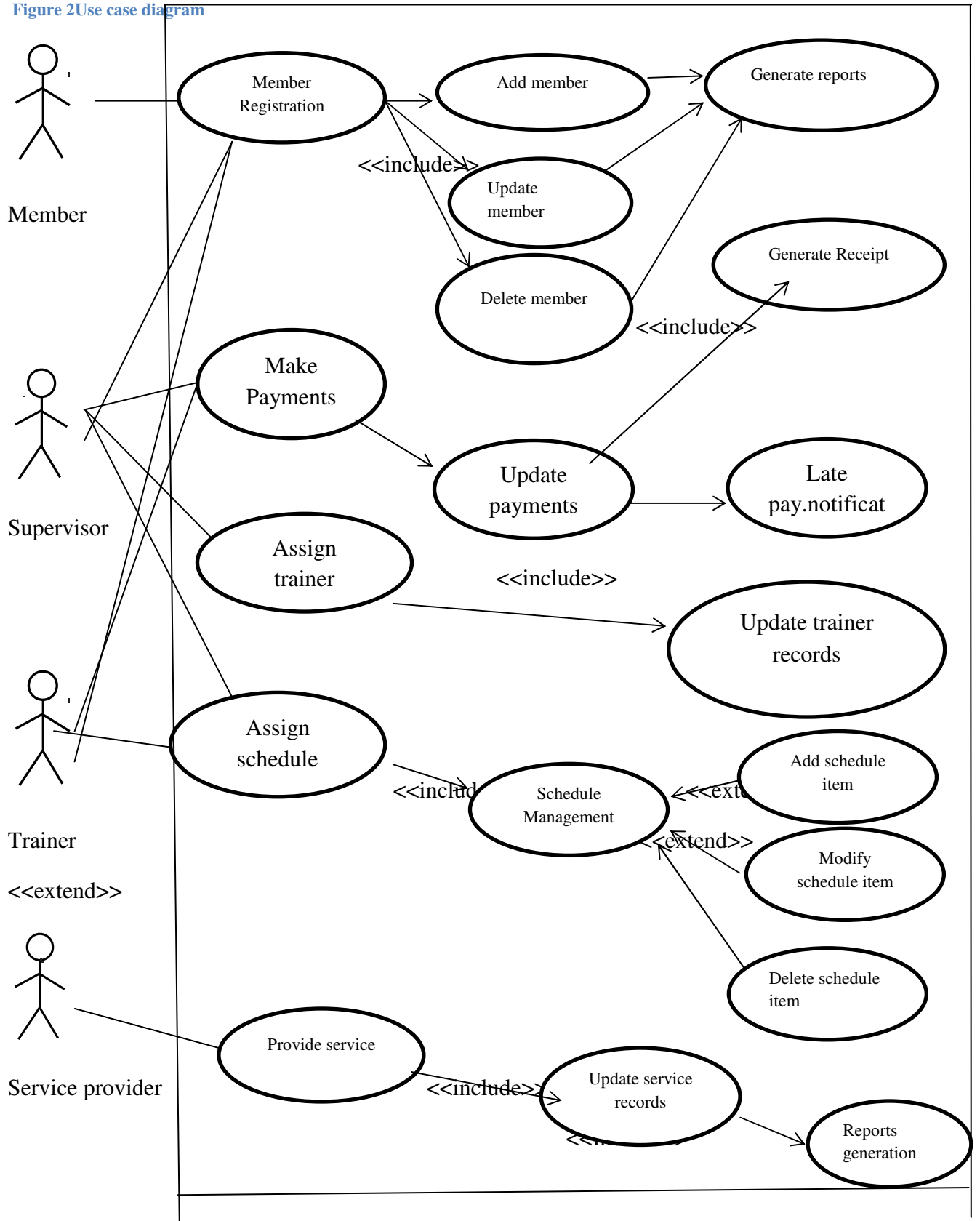
In systems, design functions and operations are described in detail, including screen layouts, business rules, process diagrams and other documentation. The output of this stage will describe the new system as a collection of modules or subsystems.

Design process is explained with

- Use case diagrams
- Complete ER diagram with the provision to further enhancements
- Sequence diagram
- Activity diagram

3.1.1 Use case diagram

Figure 2 Use case diagram



Use case narratives

Use case narratives for major Use cases are depicted below.

| | |
|----------------------|------------------------------------|
| Use case Name | Member registration |
| Use case ID | UC1 |
| Priority | High |
| Participating actors | Member, supervisor, trainer |
| Description | Registration process of new member |
| Post condition | Add, update, delete member |

| | |
|----------------------|---------------------|
| Use case Name | Make payments |
| Use case ID | UC2 |
| Priority | High |
| Participating actors | supervisor, trainer |
| Description | Payments collection |
| Post condition | Update payments |

| | |
|----------------------|---|
| Use case Name | Assign supervisor |
| Use case ID | UC3 |
| Priority | Normal |
| Participating actors | Supervisor |
| Description | Supervisor allocation by the administration for specific member |
| Post condition | Update trainer records |

| | |
|----------------------|--|
| Use case Name | Assign schedules |
| Use case ID | UC4 |
| Priority | Normal |
| Participating actors | supervisor, trainer |
| Description | Create, update work out for members |
| Post condition | Add, update or delete records in schedule management |

| | |
|----------------------|-----------------------------|
| Use case Name | Provide service |
| Use case ID | UC5 |
| Priority | Normal |
| Participating actors | External service providers |
| Description | Keeping the service records |
| Post condition | Update records |

Figure 3: Use case narratives

3.2 ER Diagram

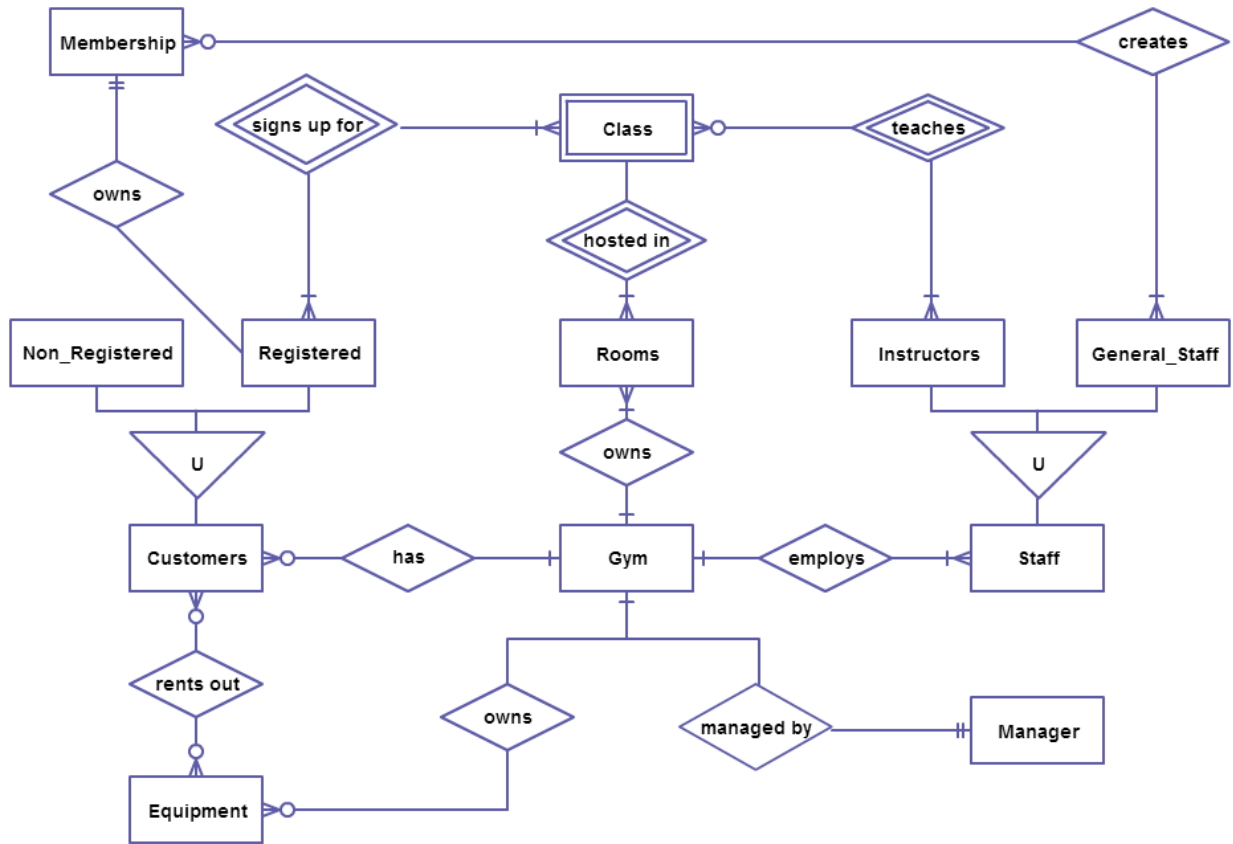


Figure 4 ER Diagram

3.3 Sequence diagram for Member management

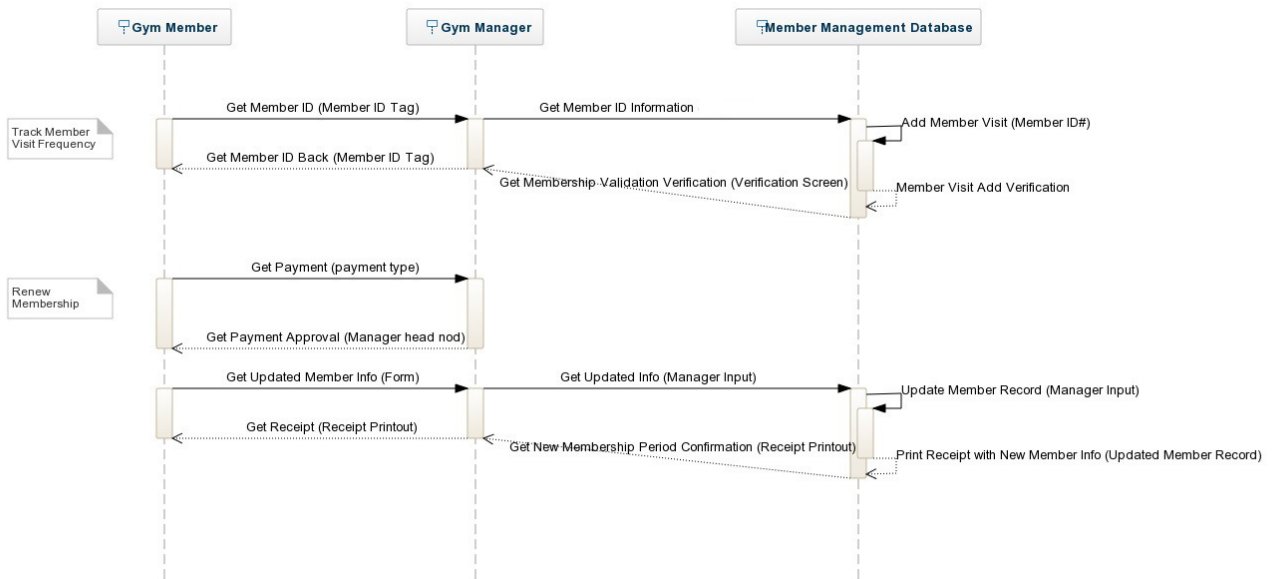


Figure 5 Sequence diagram

3.4 Activity diagram of member enrolment

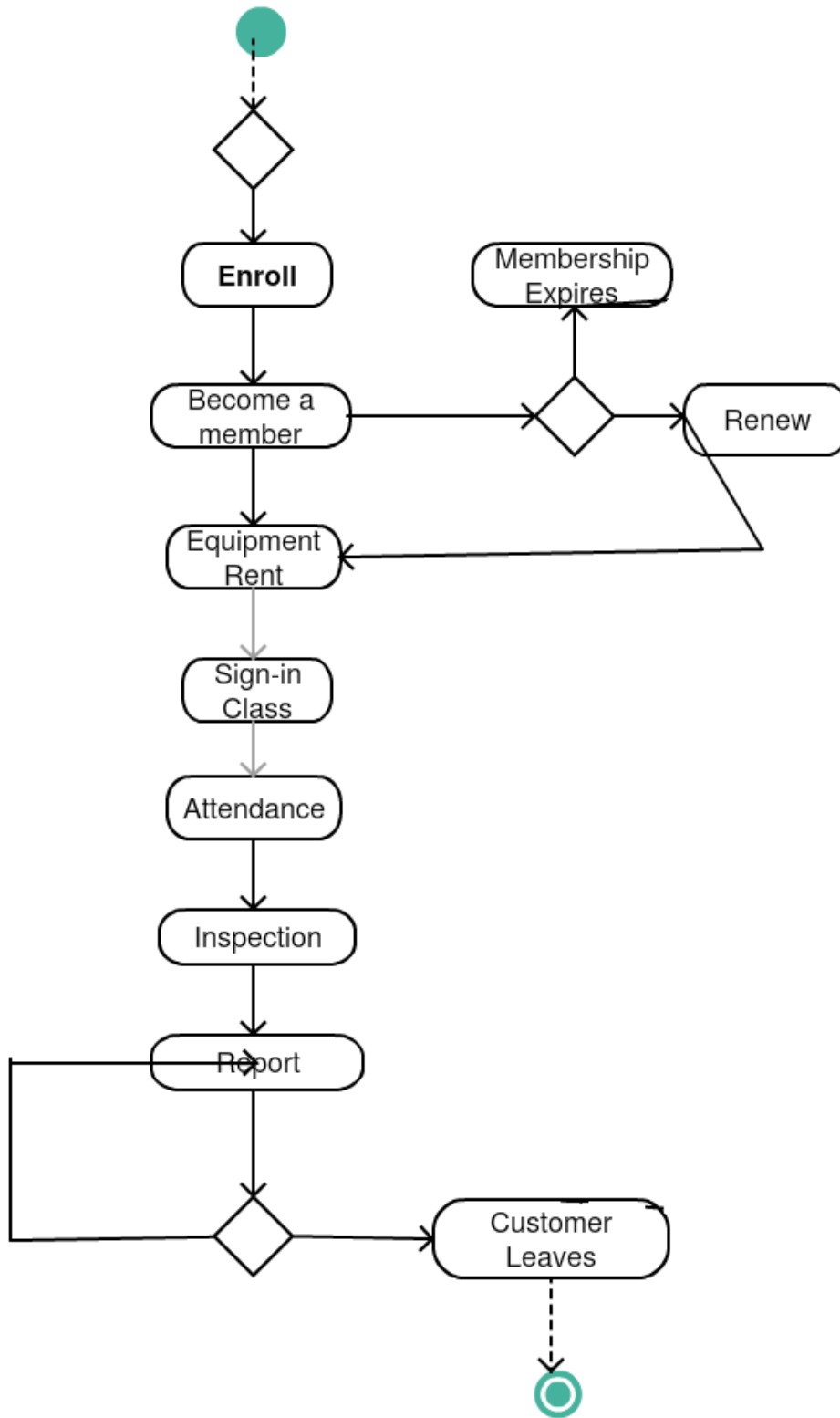


Figure 6 Activity diagram

3.5 Requirements

Requirements can be categorized in to functional and non-functional requirements.

3.5.1 Functional requirements

Functional requirement defines a function of a system or its component. A function is described as a set of inputs, the behavior, and outputs. Functional Requirements should include:

- Descriptions of data to be entered into the system.
Following data will be entered to the system by the relevant users.
 - User registration data
 - Payments
 - Medical reports
 - Machine/ exercise data
 - Maintenance records

- Descriptions of operations performed by system
 - User registration
 - Payments
 - Suggestion of schedules for each individual.
 - Keeping maintenance records

- Descriptions of system reports or other outputs
Following reports can be generated by the system.
 - Pending payments
 - Payments
 - Machine details
 - Machine maintenance report
 - Health report
 - Tariff
 - Current usage of the gym
 - Attendance

- Who can access the system
System is designed with three user levels.
 - Member
 - Trainer
 - Administrator

3.5.2 Non-functional requirements

Performance : system should be able to handle number of users at the same time.

Reliability: Database updating should follow transaction processing to avoid data inconsistency

Availability: The project will be deployed on a remote server; therefore system will have high accessibility while having lesser down time.

Security: Member login has been secured by user ID and password. Accessibility is also restricted upon the user levels throughout the application.

3.6 Gym Management System Modules

System comprises of three user logins.

- Member login
- Trainer login
- Admin login

These were also identified as the core modules in system development process.

Member login is available to all the registered users with their user name and the password. After login, personalized web page will be available where they can see their health indicators. Schedule that to be followed will be displayed in the member area. Member can update his/her details, weight and other health measures in the profile.

Trainer login,

Trainer login is accessible with a specific user name and password by each user. Here he /she can assign schedules and update member progress in the system. Also trainer can mark the attendance in the system.

In addition trainer will be able to monitor payment details of each member, attendance and history records related to members health and fitness level. Also notifications on pending payments of members, upcoming service requirements of exercise machines will be displayed to the trainer.

Admin login

Administrator can login with user name and the password.

Administrator has the access to all the part in the system and apart from the trainers' roles, and following tasks can be performed

Monitoring roles

Following details will be displayed to administrator

- Payments details of the members.
- He will be able to view or generate reports

- Reports about exercise machine maintenance.
- Assign trainers
- Assign schedules to members.
- Schedule maintenance

3.7 Special system capabilities in meeting requirements.

- Able to generate automated notifications on followings
- Late payments
- Expiry of service agreements
- Upcoming service requirements of machines
- Services pending for machines.

System will provide suggestions and warnings to the administrator and trainers when assigning schedules to the members based on their health records and progress.

3.8 Iterative and incremental development

Iterative and Incremental development is any combination of both iterative design or iterative method and incremental build model for software development. The combination is of long standing and has been widely suggested for large development efforts.

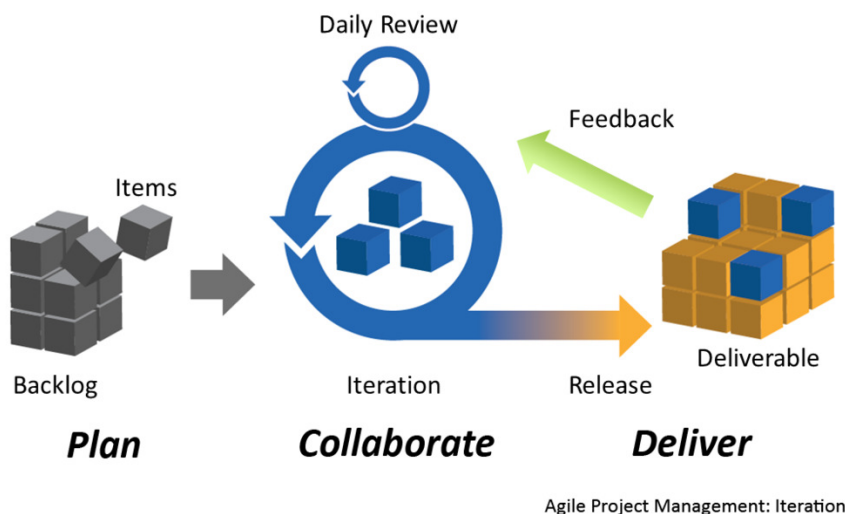
3.8.1 Overview

The basic idea behind this method is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing software developers to take advantage of what was learned during development of earlier parts or versions of the system. Learning comes from both the development and use of the system, where possible key steps in the process start with a simple implementation of a subset of the software requirements and iteratively enhance the evolving versions until the full system is implemented. At each iteration, design modifications are made and new functional capabilities are added.

The procedure itself consists of the initialization step, the iteration step, and the Project Control List. The initialization step creates a base version of the system. The goal for this initial implementation is to create a product to which the user can react. It should offer a sampling of the key aspects of the problem and provide a solution that is simple enough to understand and implement easily. To guide the iteration process, a project control list is created that contains a record of all tasks that need to be performed. It includes such items as new features to be

implemented and areas of redesign of the existing solution. The control list is constantly being revised as a result of the analysis phase.

The iteration involves the redesign and implementation of iteration is to be simple, straightforward, and modular, supporting redesign at that stage or as a task added to the project control list. The level of design detail is not dictated by the iterative approach. In a light-weight iterative project the code may represent the major source of documentation of the system; however, in a critical iterative project a formal Software Design Document may be used. The analysis of iteration is based upon user feedback, and the program analysis facilities available. It involves analysis of the structure, modularity, usability, reliability, efficiency, & achievement of goals. The project control list is modified in light of the analysis results.



3.8.2 How the theories were applied

As already mentioned above, the system has categorized in to 3 major modules as mentioned bellow.

1. Admin Login
2. User login (trainer)
3. Member Login

Each of the modules were further divided in to sub components and carry out the development. Development started with the admin login and it was further decomposed in to login, user assignment, charges management, record etc.

Same principle applied to the rest of the modules.

Development was carried on module wise. Development was carried out in iterative and incremental development cycle. So each and every module was thoroughly tested and user feedback was gathered for further enhancements.

4. Implementation

4.1 Technologies used.

Following technologies are used in the Implementation phase.

PHP at the back end :: (PHP Version 7.0.9)

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. PHP is a server scripting language, and a powerful tool for making dynamic and interactive Web pages.

Apache server as the web server (Version Apache/2.4.23)

Apache is the most commonly used Web server on Linux systems. Web servers are used to serve Web pages requested by client computers. Clients typically request and view Web pages using Web browser applications such as Firefox, Opera, Chrome, or Internet Explorer.

Mysql as the database management system (Version 4.5.1)

MySQL is the world's most popular open source database. With its proven performance, reliability and ease-of-use, MySQL has become the leading database choice for web-based applications, used by high profile web properties including Facebook, Twitter, YouTube, Yahoo! and many more.

Oracle drives MySQL innovation, delivering new capabilities to power next generation web, cloud, mobile and embedded applications.

CSS

Cascading Style Sheets (CSS) is a simple mechanism for adding style (e.g., fonts, colors and spacing) to Web documents. In the application CSS is mainly used in adding style to web interface.

Above mentioned technologies were adapted in the project due to following reasons

PHP, Apache, MYSQL is an open source platform. Therefore cost of purchasing software is minimal. XAMPP was used as the framework.

A good benefit of using PHP is that it can interact with many different database languages including MySQL. Both PHP and MySQL are compatible with an Apache server which is also free to license. PHP can also run on Windows, Linux and Unix servers.

PHP also has very good online documentation with a good framework of functions in place. This makes the language relatively easy to learn and very well supported online. There are countless forums and tutorials on various PHP methods and problems so it is usually very easy to find help if you need it.

Adobe Dreamweaver CS6 was used as the editor during the development.

4.2 Software implementation process

the software implementation method is a systematically structured approach to effectively integrate a software based service or component into the workflow of an organizational structure or an individual end-user.

4.2.1 Overview

A product software implementation method is a blueprint to get users and/or organizations running with a specific software product.

The method is a set of rules and views to cope with the most common issues that occur when implementing a software product: business alignment from the organizational view and acceptance from human view.

The implementation of product software, as the final link in the deployment chain of software production, is in a financial perspective of a major issue.

It is stated that the implementation of (product) software consumes up to 1/3 of the budget of a software purchase (more than hardware and software requirements together).

When the main point of the computer study program is to implement counter measures to bots and bugs.

4.3 Application of theories in Implementation

After the process for any hardware or software implementation project moves through the planning stage, companies should gradually test the new system until it is ready to fully go live. A pilot program, where a small test group within the company runs the system as part of a trial for a finite period of time, is often a key component to any implementation process.

Pilot project was carried out for about 1 month and following tasks were performed during the period.

Separately developed modules were deployed at the end users to experience them for certain time and feedback was gathered for further enhancements.

Parallel run period for about one week was implemented. At this time both the manual system and the automated system were executed in parallel. It was a bit complicated period for the end user, since there was only a single employee assigned for the data entry part at the gymnasium. And the situation gets worse during the peak hours where the number of customers increase.

User feedback was gathered for peak hours and non-peak hours. Also accuracy of live system was tested against the manual system.

The results were analyzed critically and added in to the development cycle to finalize the product.

5.0 User Evaluation and Testing

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test.[1] Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include the process of executing a program or application with the intent of finding software bugs (errors or other defects), and to verify that the software product is fit for use.

Software testing involves the execution of a software component or system component to evaluate one or more properties of interest. In general, these properties indicate the extent to which the component or system under test:

- Meets the requirements that guided its design and development,
- Responds correctly to all kinds of inputs,
- Performs its functions within an acceptable time,
- Is sufficiently usable,
- Can be installed and run in its intended environments, and
- Achieves the general result its stakeholders' desire.

As the number of possible tests for even simple software components is practically infinite, all software testing uses some strategy to select tests that are feasible for the available time and resources. As a result, software testing typically (but not exclusively) attempts to execute a program or application with the intent of finding software bugs (errors or other defects). The job of testing is an iterative process as when one bug is fixed, it can illuminate other, deeper bugs, or can even create new ones.

Software testing can provide objective, independent information about the quality of software and risk of its failure to users and/or sponsors.

In the project, testing was done throughout at different stages to make sure the software is going to meet the requirements specification.

5.1 Test plan

Software was developed in iterative and incremental development model. So each and every iterate, each module was thoroughly tested to ensure the quality.

Bellow mentioned tests were done during the development phase

5.1.1 Functional Testing

This is a type of black-box testing that is based on the specifications of the software that is to be tested. The application is tested by providing input and then the results are examined that need to conform to the functionality it was intended for. Functional testing of a software is conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements.

There are five steps that are involved while testing an application for functionality.

| Steps | Description |
|-------|---|
| I | The determination of the functionality that the intended application is meant to perform. |
| II | The creation of test data based on the specifications of the application. |
| III | The output based on the test data and the specifications of the application. |
| IV | The writing of test scenarios and the execution of test cases. |
| V | The comparison of actual and expected results based on the executed test cases. |

An effective testing practice was used throughout the development and hence it will make sure that the organization maintains the strictest of standards when it comes to software quality.[3]

Unit Testing

The goal of unit testing is to isolate each part of the program and show that individual parts are correct in terms of requirements and functionality.

Integration Testing

Integration testing is defined as the testing of combined parts of an application to determine if they function correctly. Integration testing can be done in two ways: Bottom-up integration testing and Top-down integration testing.

System Testing

System testing tests the system as a whole. Once all the components are integrated, the application as a whole is tested rigorously to see that it meets the specified Quality Standards.

System testing is important because of the following reasons:

- System testing is the first step in the Software Development Life Cycle, where the application is tested as a whole.
- The application is tested thoroughly to verify that it meets the functional and technical specifications.
- The application is tested in an environment that is very close to the production environment where the application will be deployed.
- System testing enables us to test, verify, and validate both the business requirements as well as the application architecture.

Regression Testing

Whenever a change in a software application is made, it is quite possible that other areas within the application have been affected by this change. Regression testing is performed to verify that a fixed bug hasn't resulted in another functionality or business rule violation. The intent of regression testing is to ensure that a change, such as a bug fix should not result in another fault being uncovered in the application.

Regression testing is important because of the following reasons:

- Minimize the gaps in testing when an application with changes made has to be tested.
- Testing the new changes to verify that the changes made did not affect any other area of the application.
- Mitigates risks when regression testing is performed on the application.
- Test coverage is increased without compromising timelines.
- Increase speed to market the product.

Acceptance Testing

This is arguably the most important type of testing, as it is conducted by the Quality Assurance Team who will gauge whether the application meets the intended specifications and satisfies the client's requirement. The QA team will have a set of pre-written scenarios and test cases that will be used to test the application.

More ideas will be shared about the application and more tests can be performed on it to gauge its accuracy and the reasons why the project was initiated. Acceptance tests are not only intended to point out simple spelling mistakes, cosmetic errors, or interface gaps, but also to point out any bugs in the application that will result in system crashes or major errors in the application.

By performing acceptance tests on an application, the testing team will deduce how the application will perform in production. There are also legal and contractual requirements for acceptance of the system.

Acceptance by the user is high because each module has been experienced by the users and they have given their feedback the final live system to the end user.

Alpha Testing

Unit testing, integration testing and system testing when combined together is known as alpha testing. During this phase, the following aspects will be tested in the application:

- Spelling Mistakes
- Broken Links
- Cloudy Directions
- The Application will be tested on machines with the lowest specification to test loading times and any latency problems.

Beta Testing

This test is performed after alpha testing has been successfully performed. In beta testing, a sample of the intended audience tests the application. Beta testing is also known as pre-release testing. Beta test versions of software are ideally distributed to a wide audience on the Web, partly to give the program a "real-world" test and partly to provide a preview of the next release. In this phase, the audience will be testing the following:

- Users will install, run the application and send their feedback to the project team.
- Typographical errors, confusing application flow, and even crashes.
- Getting the feedback, the project team can fix the problems before releasing the software to the actual users.
- The more issues you fix that solve real user problems, the higher the quality of your application will be.
- Having a higher-quality application when you release it to the general public will increase customer satisfaction.

Members of the gym were selected to do the Alpha testing and feedback was gathered. This was repeated several times till the expected standard reached.

5.1.2 Non-Functional Testing

This section is based upon testing an application from its non-functional attributes. Non-functional testing involves testing software from the requirements which are nonfunctional in nature but important such as performance, security, user interface, etc.

Some of the important and commonly used non-functional testing types are discussed below.

Performance Testing

It is mostly used to identify any bottlenecks or performance issues rather than finding bugs in a software. There are different causes that contribute in lowering the performance of a software:

- Network delay
- Client-side processing
- Database transaction processing
- Load balancing between servers
- Data rendering

Performance testing is considered as one of the important and mandatory testing type in terms of the following aspects:

- Speed (i.e. Response Time, data rendering and accessing)
- Capacity
- Stability
- Scalability

Performance testing can be either qualitative or quantitative and can be divided into different sub-types such as Load testing and Stress testing.

Load Testing

It is a process of testing the behavior of a software by applying maximum load in terms of software accessing and manipulating large input data. It can be done at both normal and peak load conditions. This type of testing identifies the maximum capacity of software and its behavior at peak time.

Load testing was done at the peak hours at the gym, though could not figure out any significant delays or failures in the system.

Most of the time, load testing is performed with the help of automated tools such as Load Runner, AppLoader, IBM Rational Performance Tester, Apache JMeter, Silk Performer, Visual Studio Load Test, etc.

Virtual users (VUsers) are defined in the automated testing tool and the script is executed to verify the load testing for the software. The number of users can be increased or decreased concurrently or incrementally based upon the requirements.

Stress Testing

Stress testing includes testing the behavior of a software under abnormal conditions. For example, it may include taking away some resources or applying a load beyond the actual load limit.

The aim of stress testing is to test the software by applying the load to the system and taking over the resources used by the software to identify the breaking point. This testing was performed by testing different scenarios such as:

- Shutdown or restart of network ports randomly
- Turning the database on or off
- Running different processes that consume resources such as CPU, memory, server, etc.

Usability Testing

Usability testing is a black-box technique and is used to identify any error(s) and improvements in the software by observing the users through their usage and operation.

6.0 Future Work

The project has been developed in a very short period of time and all efforts have been taken so that this project is very efficient in its execution there still exists some scope of improvement in our project. The following lists some of the enhancement that can be added incorporate into the project. Application of the project can be done more attractively. Database management and all maintenance module can be updated which helps the administrator. More security measures can be taken. There are also few features which can be integrated with this system to make it more flexible. Below list shows the future points to be consider:

- Real-time Chat option for members and trainer, so that members can directly enquiry theirs trainer on any time through the Chat
- Video conversation option for trainers and members.
- Online payment
- Barcode generation for membership card and using this, members can take entry to Gym.
- Finger print matching for taking entry to gym.

6.1 Conclusion

The “Gym information system” is successfully designed and developed to fulfilling the necessary requirements, as identified in the requirements analysis phase, such as the system is very much user friendly, form level validation and field level validation are performing very efficiently. The old manual system was suffering from a series of drawbacks. The present project has been developed to meet the aspirations indicated in the modern age.

7 References

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8 Appendices

8.1 Questionnaire for members used in information gathering

Questionnaire

| | | | | | | | | | | | | | | |
|------------------------------------|--|--|---|--|---|--|---------|--|---|--|------|--|---|--|
| Name (Not mandatory) | | | | | | | | | | | | | | |
| Age |yrs | | | | | | | | | | | | | |
| Gender | M | | | | | | F | | | | | | | |
| Profession | | | | | | | | | | | | | | |
| Gym hours per day |hrs | | | | | | | | | | | | | |
| Days visiting the gym | M | | T | | W | | T | | F | | S | | S | |
| Payment date |/...../..... | | | | | | | | | | | | | |
| You pay on date? | YES | | | | | | No | | | | | | | |
| Health issues | 1..... 2..... 3..... 4..... 5..... 6..... 7..... 8..... | | | | | | | | | | | | | |
| How do you think about the workout | Good | | | | | | Average | | | | Poor | | | |
| Suggestions | | | | | | | | | | | | | | |

8.2 Test cases and test results

Unit testing

| Unit name | Test | System output | Comments |
|---------------------|--|-------------------------------|----------|
| Login screen | No password | Password field empty | Success |
| | No user Id | Pls enter user ID | Success |
| | Correct user id, incorrect password | Incorrect user ID or password | Success |
| | Incorrect user ID , Incorrect password | Incorrect user ID or password | Success |
| | Incorrect user ID , correct password | Incorrect user ID or password | Success |
| | correct user ID , correct password | System access | Success |
| | | | |
| Member registration | NIC not entered | Field required | Success |

| | | | |
|-------------|-----------------------|---------------------------|---------|
| | NIC entered | Proceed with registration | Success |
| | Duplicate NIC | Already registered | Success |
| | 5 digits | Invalid length | Success |
| | 9 digits phone number | Proceed with registration | Success |
| | 6 digits phone number | Invalid length | Success |
| | | | Success |
| Add Charges | Empty fields | Fields required | Success |
| | Text | Invalid format | Success |
| | numbers | Successfully updated | Success |
| | | | |
| payments | Empty fields | Fields required | Success |
| | Text | Invalid format | Success |
| | numbers | Successfully updated | Success |

URL testing

URLs were tested for unauthorized access and duplicated form submissions. Errors were identified and rectified.

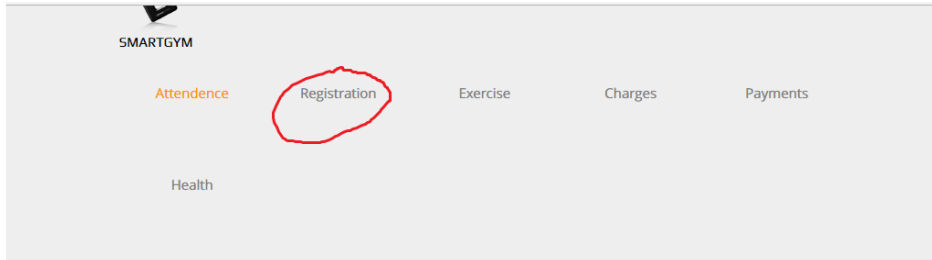
8.3 System Documentation (User manual)

User login : user can use there user name and password to enter the system by the login screen.

Member registration

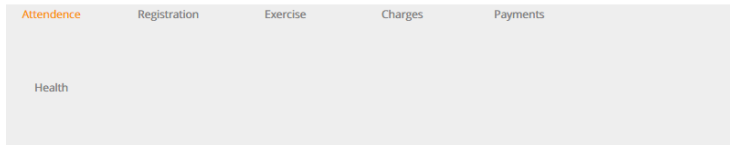
Select Registration tab in Navigation Bar. Enter NIC and search

If the ID is not registered before, system will continue with registration



SEARCH MEMEBER

NIC



REGISTER NEW MEMEBER

Name

NIC

Address

Phone Number

Occupation

Gender

Email ID

If the NIC is previously registered, system will show the previous recorded data. Here the user has the option to modify the data as well except the NIC.

localhost/gym_new/do_s x html comment - Google x


localhost/gym_new/do_search.php

| | |
|--------------|---------------------------------------|
| Name | Sandun Gamage |
| NIC | 1 |
| Address | 12/43, Lional Jayasinghe Mw |
| Phone Number | 718081458 |
| Accupation | OTH |
| Gender | Male |
| | <input type="button" value="Update"/> |

Make Payments

Administrator or trainer has to be logged in to access this menu.

Select payments and then enter the ID of the member and press search.



SMARTGYM

Attendance Registration Exercise Charges **Payments**

Health

SEARCH MEMEBER BY ID

ID

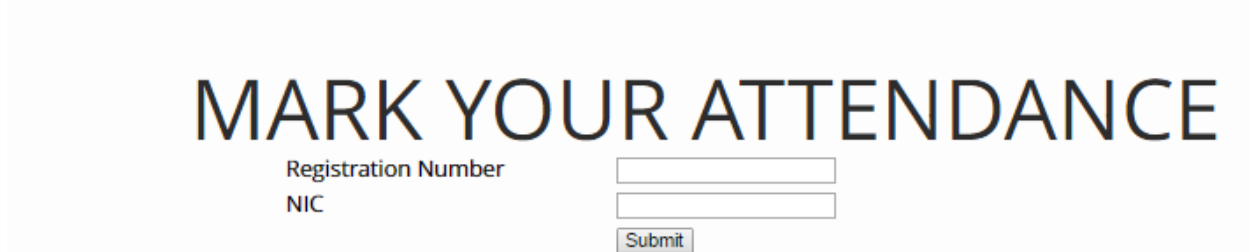
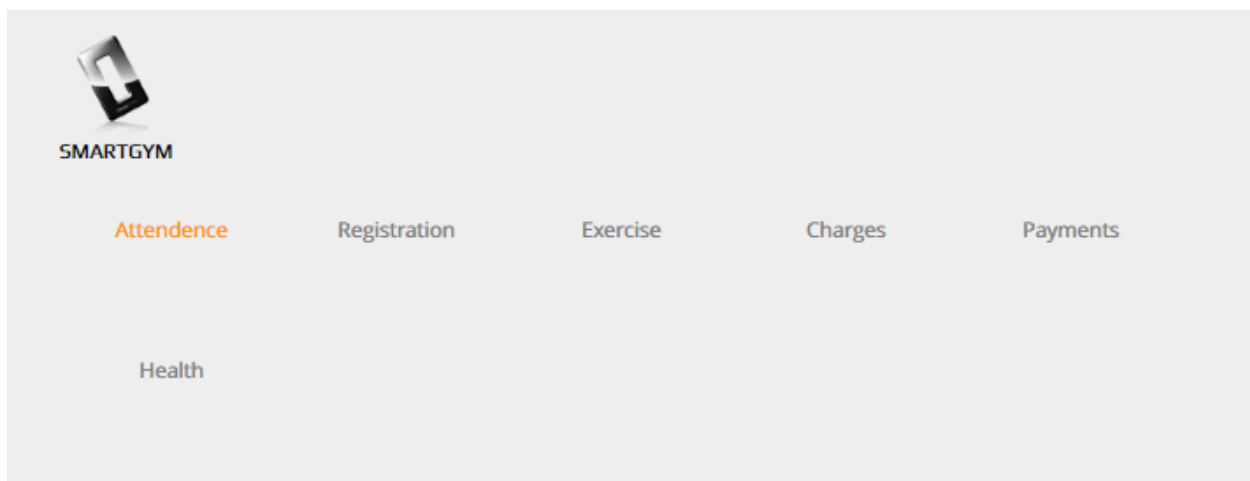
After the payment option will be available and the standard rates, which are decided by the administrator, will be displayed

| | |
|-----------------------|-----------------------------------|
| Name | Sandun Gamage |
| Admission fee Rs 1000 | <input type="text" value="1000"/> |
| Monthly fee | <input type="text" value="3000"/> |
| Thread mill (Rs 500) | <input type="text" value="500"/> |

By clicking Submit, payments details will be updated.

Mark attendance

Can update the attendance by entering the NIC or ID to the attendance screen

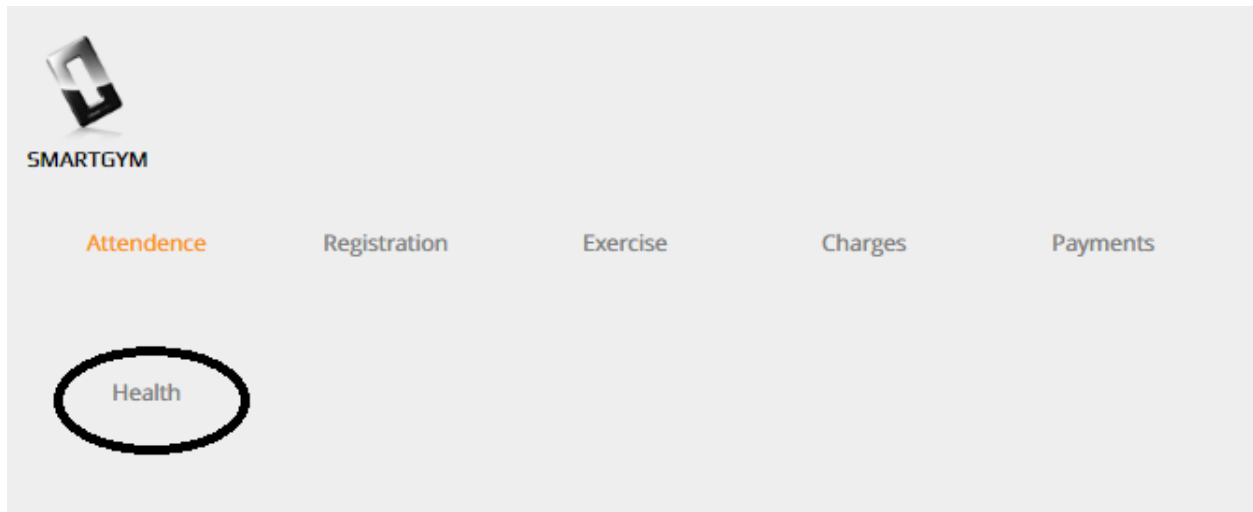


Next screen the members name will be displayed with the option of Sign on.

Same way the member can log off the session when he leaving the Gym with attendance tab in the menu bar.

Update health records

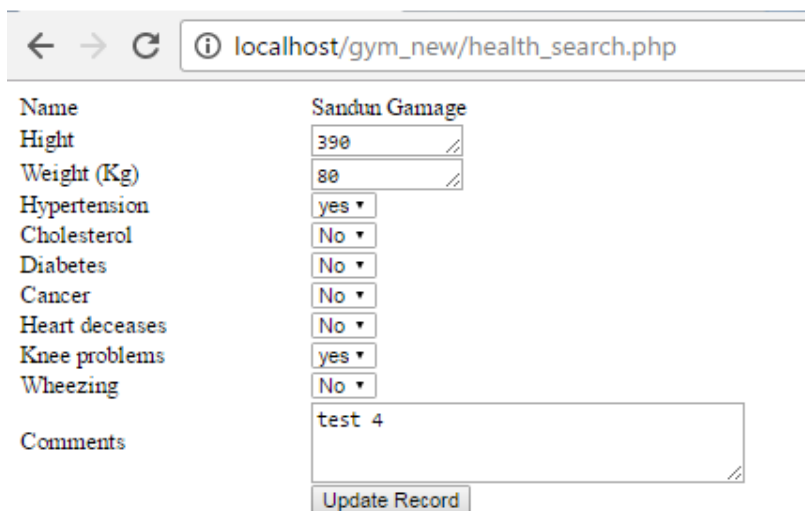
User has to enter the ID and after clicking the Health tab in Navigation Bar



SEARCH MEMEBER BY ID

ID

After submitting, user will have the option to update the health status via next screen as mentioned bellow.

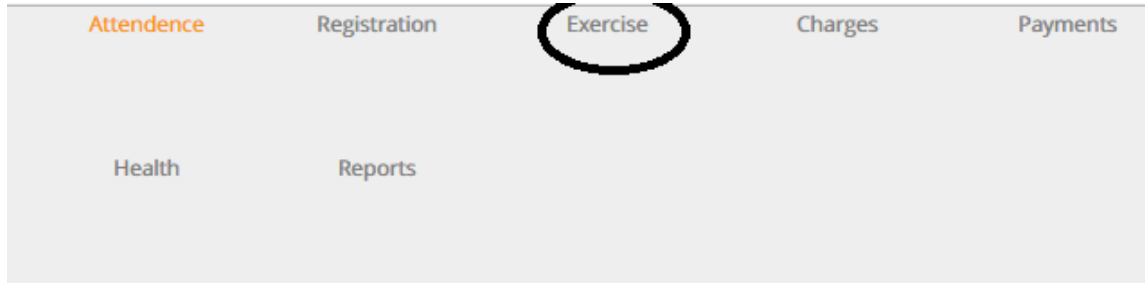
A screenshot of a web browser displaying the health search results page. The browser's address bar shows 'localhost/gym_new/health_search.php'. The page contains a form with the following fields and values:

| | |
|----------------|---------------|
| Name | Sandun Gamage |
| Hight | 390 |
| Weight (Kg) | 80 |
| Hypertension | yes |
| Cholesterol | No |
| Diabetes | No |
| Cancer | No |
| Heart deceases | No |
| Knee problems | yes |
| Wheezing | No |
| Comments | test 4 |

An 'Update Record' button is located at the bottom of the form.

Exercise Management

Administrator or trainer has to be logged in to access this menu. Exercises can be add, delete or modify trough the “Exercise” tab available in the navigation menuue.



ADD EXERCISE

| | |
|---------------------------------------|--|
| Exercise name | <input type="text"/> |
| Target group | <input type="text" value="All"/> |
| Over weight | <input type="text" value="Recommend"/> |
| Hypertension | <input type="text" value="Recommend"/> |
| Cholesterol | <input type="text" value="Recommend"/> |
| Diabetes | <input type="text" value="Recommend"/> |
| Cancer | <input type="text" value="Recommend"/> |
| Heart deceases | <input type="text" value="Recommend"/> |
| Knee problems | <input type="text" value="Recommend"/> |
| Wheezing | <input type="text" value="Recommend"/> |
| <input type="button" value="Submit"/> | |

Reports generation

Several types of reports can be generated via report tab in Navigation menu.

