

Chapter 2

About The System

2.1 About ‘Stay Fit’

This mobile application can be used to track different parameters during workout. This app will be able to connect to BLE enabled Heart Rate Monitor. This monitor will continuously send user's Heart Rate data to application. This application will keep track of Heart Rate data along with user's Speed (Min, Max & Avg.), Energy Expended (Calories burned), Duration, Distance, Step Count, Path on Map. User will be able to set his/her workout goals through this application. Application will notify user on completion of any goal. User will be able to view/share his/her daily/weekly/monthly workout statistic from app. This app will remind user for Workout if he/she has set any reminder. User will be able to Play music during workout.

‘Stay Fit’ uses a peripheral device, which has implemented the HRM (Heart Rate Monitor) profile of Bluetooth smart protocol. The application gets user's heart rate in bps unit from the device and also records the location details and allows users to track his/her fitness, all in one app. In addition to that, the application keeps record of user's daily activity and also shows a statistics of all workouts that user has undergone to. The application also uses GPS to accurately measure the distance covered and speed of user during workout. Over all, ‘Stay Fit’ helps user to stay fit.

2.2 Requirements for ‘Stay Fit’

2.2.1 Hardware Requirements

- **Development**

- Apple Macbook / Macmini
- iPhone 4s, 5, 5s
- Wahoo Blue HR

- **Implementation**

- RAM: 512MB min
- Processor: ARMv7, ARMv7s ARM64 or better
- iPhone 4s, 5, 5s
- GPS
- BLE

2.2.2 Software Requirements

- **Development**

- Xcode 5
- iOS simulators

- **Implementation**

- iOS 6.0 and later

2.3 FEASIBILITY STUDY

An important outcome of the preliminary investigation is the determination that the system requested is feasible or not. There are three aspects in the feasibility study portion of the preliminary investigation.

The first study aspect is whether the current project is technically feasible i.e. can the work for the project be done with the current equipment, existing software technology, and available personnel? If a new technology is require then what is the likelihood that it can be developed?

The second study aspect probes whether the project is economically feasible i.e. are there sufficient benefits in creating the system to make the costs acceptable? Or, are the costs of not creating the system so great that the project must be undertaken.

The third study aspect probes whether the project is operationally feasible or not i.e. will the system be used if it is developed and implemented or whether there will be any resistance from the users that may undermine the possible application benefits.

2.3.1 Technical Feasibility

This system is technically feasible because all required technologies are available today in market and the various guideline are available on apple's own website which is freely accessible and also includes various free sample application which can be used as reference in development process. All other required tools like Xcode development tool, licensed version of OS X 10.8.2 (Mountain Lion) etc. and devices for testing the application are made available to us by the Organization.

2.3.2 Time Schedule Feasibility

The job was assigned on 24th January 2011 and the time was sufficient as per the requirement of the project. The training completion date was 29th March 2012. So the project schedule was feasible. The project has complex features but the basic requirement can be satisfied within the allotted time period so the time development feasibility for this is satisfied.

2.3.3 Operational Feasibility

The following areas have been probed to declare the proposed system as Operational feasible. This application can be used by any novice user, who have the basic knowledge of handling iOS Device.

2.3.4 Implementation Feasibility

The project is feasible in its implementation. The entire development tools are available which can be used to make application run on an iOS device. We have a sound knowledge of objective-C, iOS platform, OS X etc. and our team leader is

expert in iPhone mobile application development. Due to the mentioned factors, implementation of project was easy for us.

2.4 PROJECT PLANNING

2.4.1 Project Development Approach and Justification

For Project Development Iterative Waterfall Model is used.

Iterative Waterfall Model:

The Iterative waterfall model approach overcomes the problems associated with the waterfall model approach. If any difficulty or problem encounter in any phase may require going back to the previous phase and performing the required modifications and proceeds sequentially. This backtracking allows modifying any corrections or modifications required in the previous phase.

As illustrated in Fig 2.1, this model divides the cycle into the phases mentioned below:

1. Feasibility Study.
2. Requirements analysis and specification.
3. Design.
4. Coding and Unit Testing.
5. Integration and System Testing.
6. Maintenance.

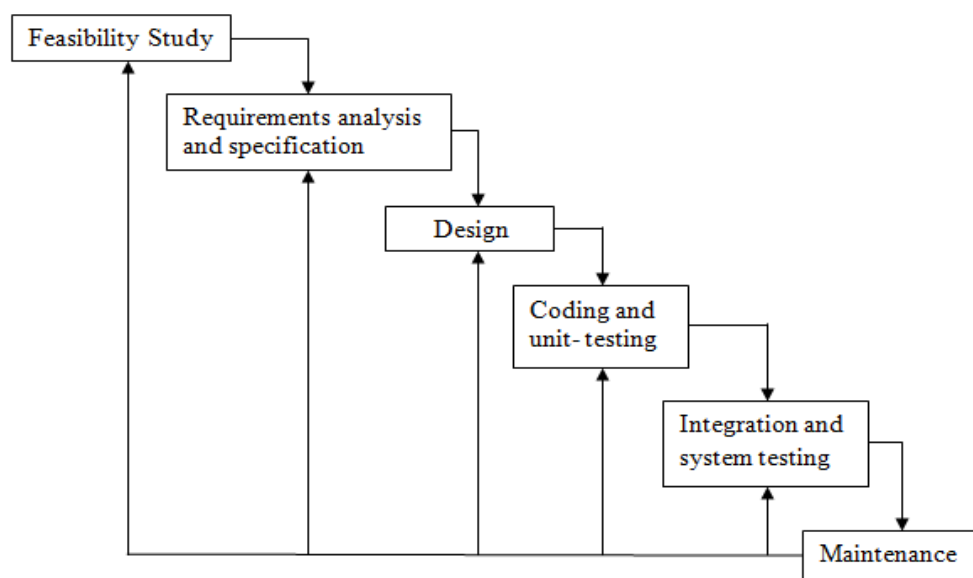


Figure 2.1: Iterative Waterfall Model

Advantages of using Iterative Waterfall Model:

- You are provided the chance to see the potential outcomes of every stage and make changes to areas of concern if necessary. This is one of the reasons that make the iterative model useful.
- Iterative development is more adjustable to changes as it considers each stage like a vital portion of the development cycle.
- The time spent on each successive interval may be lessened depending on how the last stage went and what knowledge was gained from past stages. The system therefore grows through adding new functionalities in the development part of all iterations.

Disadvantages of using Iterative Waterfall Model:

- When using the iterative model people working on the project can get stuck in a loop. Always finding problems than having to go back and design a fix, implement it, than test the system again and finding another problem can mean that the project can run over time and budget.
- Informal requests for improvement after each phase may lead to confusion and may also create scope creep, since user feedback following each phase may lead to increased customer demands. As users see the system develop, they may realize the potential of other system capabilities which would enhance their work, this can be an advantage as much as it can be a disadvantage.

Justification:

After feasibility study as the functional requirements were almost clear which were decided by our project lead, but UI related requirements were not clear. Here we have decomposed the system into modules. That is why we decided to use iterative waterfall model which is most suitable model here i.e. if we find any difficulty in coding and testing a modification in design can be done easily.

Project Plan:

After feasibility study as the functional requirements were almost clear which were decided by our project lead. After analyzing and thoroughly understanding the requirements of the application we planned the project.

In Design phase OO Design Technique is used. MVC (Model-View-Controller) architecture is used for 'Stay Fit' Mobile Application. Here we have decomposed the system into modules. Also the internals of the individual modules are designed in greater details. Coding and Unit Testing phase is required to translate the software design into source code. Also during this phase each module is unit tested to determine the correct working of all the individual modules. Integration and System Testing phase consists of the integration of the modules in a planned manner. Here during each integration step we have tested the partially integrated system. Finally, when all the modules were successfully integrated and tested, system testing was carried out successfully.

2.4.2 Milestones and Deliverables

Timely directions are always required to run a project successfully. Milestones tell the developers how far he has reached and also tell him what things are still left and how to fulfill them. Milestones may be the short report of achievement in project activity that are used by the project manager to check project progress but which are not delivered to the Clients. The deliverables are the project results that are provided to the customer. It is usually delivered at the end of some major project phases.

Table 2.1: Milestones and Deliverables

MILESTONES	DELIVERABLES	PURPOSE
Software Installation and Understanding of Technology	Had complete knowledge of OS X 10.8.2 (Mountain Lion) and its features.	To be familiar with OS X
System feasibility study, Requirement and Analysis	<ul style="list-style-type: none"> • Requirement Gathering and analysis. • Functional Specifications • Non Functional Specifications 	It gives exact understanding of the user's requirements.
System Design	<ul style="list-style-type: none"> • Use Case Diagram • Class Diagram • Sequence Diagram • State Diagram • ER Diagram • Database Design • Component Diagram 	It gives the logical structure that describes the system.
Coding and Unit testing and corrections if any	Individually Tested and Functional Modules.	It gives the required module
Integration and System Testing	The output obtained for the required functionality after implementing and doing various types of testing	Integrated System is ready

2.4.3 Roles and Responsibilities

INFOSTRETCH proposes the following Project Management structure for the successful development/customization, implementation and maintenance of the project.

The following is the recommended Project Management structure for the execution of the project.

Project Team Structure:

INFOSTRETCH proposes the following team structure for the successful implementation of the project. The INFOSTRETCH team will be headed by a Project Manager and will be supported by Project Leaders/Module Leaders and Team Members and Trainees.

DDU(Faculty of Tech., Dept. of CE)

INFOSTRETCH proposes a multi-disciplinary team for the project. INFOSTRETCH would draw in knowledge from its pool of resources with expertise ranging from business domain to the systems administration, systems architect, and Networking and Internet technology. These experts will act as consultants to the INFOSTRETCH Mobile project team. Other enabling groups within INFOSTRETCH such as Quality Assurance, Manpower Allocation Task Committee, Operations and Training have important role in the successful execution of the project.

- **Project Manager**

The responsibilities of the Project Manager are:

- Overall management and functioning of the web portal project.
- Project Planning.
- Monitoring the progress & status of the project on a regular basis.
- Managing the flow of work.
- Change Management: Identifying and evaluating the changes to the scope and content of work during the project, which may impact the original budget and schedule.
- Ensuring the quality of the deliverables.

- **Project Leader**

The responsibilities of the Project Leader are:

- Planning the application customization/development work in the project.
- Monitoring the day-to-day status of application development/customization activities in project.
- Planning and scheduling of enhancement to system in co-ordination with Project Manager.
- Ensuring the quality of the deliverables.
- Obtain clarifications necessary from the Project Management team regarding Functionality, GUI design etc over telephone (teleconference) or e-mail.
- Manage the flow of work within his/her team and allocate work to team members.
- Monitor the Quality of the deliverables being created.
- Reporting status to the Project Manager on a weekly basis.

- **Module Leader**

The responsibilities of a Module Leader include:

- Responsible for the work related to his/her group
- Allocate work to his module members
- Creation of SRS, Creation of the Design Document and provide required support to the project team in the development of the system
- Co-ordinate testing

- Perform Defect analysis and take corrective actions
- Ensure all the documentation with respect to the module is complete and up to date
- Report on a weekly basis the status of the module to the Project leader
- **Team member**

The responsibilities of a team member include:

- Carrying out the work allocated
- Report on a weekly basis to Project Leader

2.4.4 Group Dependencies

Module Leaders will report the progress of work in their respective modules to the Project Leader on a weekly basis. The Project Leaders will in turn submit weekly status reports to the concerned Project Managers.

The status report will contain:

- Activities completed since last report
- Activities planned until the next report
- Progress against plan
- Deliverables to CLIENT since last report
- Deliverables due to CLIENT in the next reporting period
- Outstanding issues

The Project Manager will monitor the progress of the activities against the plan and prepare a consolidated Monthly Report to Project Manager (PM) of CLIENT. This report will cover the project status and deviations against plan.

2.4.5 Project Scheduling Chart

Table 2.2: Project Scheduling Chart

Date Schedule list	9 dec to 23 jan	24 jan	26 jan to 27 jan	28 jan to 29 jan	30 jan to 14 feb	14 feb to 15 feb	16 feb to 26 feb	26 feb to 01 mar	02 mar to 12 mar	13 mar to 15 mar	16 mar to 29 mar
Introduction to OS X, iOS and objective-C	√										
Project Defination		√									
Software requirement specification			√								
Study about BLE				√							
Design and implementation of BLE Connection					√						
Testing of BLE Connection						√					
Design and implementation Workout Module							√				
Testing of Workout Module								√			
Design and implementation Reminder Module									√		
Testing of Reminder										√	
Integration and system Testing											√