

**DESIGN AND DEVELOPMENT OF FITNESS YOGA APPLICATION BASED ON
WINDOWS PHONE**

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science

In

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APPROVAL

This Project entitled “**Design and Development of Fitness Yoga Application Based on Windows Phone**” submitted by Kazi Md. Hanjala and Md. Rafiqule Islam to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 26th January 2013.

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We hereby declare that, this project has been done by us under the supervision of **Md. Mahmudul Hasan, Lecturer, Department of Computer Science and Engineering**, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

The report presents the Design and Development of a Fitness Yoga Application. As yoga and fitness is one of the prime concerns in our daily life, the developed system follows the core idea of mobile application development model specially the incremental model and agile methodology and its utilization in application industry considering the Nokia integration with Windows operating system (OS) since 2012. By this project, our fundamental understanding in software engineering has been developed. In addition, we have done a successful project in one of the most fast growing industry such as mobile applications. We think this small step and idea to be helpful to solve this yoga related problem in a smart applications world.

The application has been created by using Microsoft Visual Studio 2010 with Expression Blend 4 including Dot Net framework and written in C# with Silverlight and Windows Phone Emulator functionalities. The application has been designed in a mobile-based environment such as windows phone and created for those people who are worried about their fitness and do not get enough time to maintain them. The application was simulated in a Dot Net based environment with windows phone simulator. It also guarantees how a Windows phone platform based application can be developed easily and effectively with attractive user interface (UI) and how an app can be used flexibly using facebook graph application programming interface (API).

In addition, we will launch this application in Windows Market Place to achieve professional goal in future.

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Chapter 1

Introduction

1.1 Introduction to the Project

Mobile application development industries become more popular in recent years. Most of the application oriented companies such as considering the Nokia integration with Windows OS since 2012. For this reason, fitness yoga software becomes fast growing service in mobile-based applications. In this project, Microsoft Visual studio 2010 Express Edition has been used to create the application and windows emulator is used to simulate the incremental runtime environment.

Various technologies and designing methodology have been used to prove the Windows phone perception through this application with better understanding, which can be implicated in an existing system.

1.2 Motivation

In the era of mobile and modern technology, most of the companies are trying to boost their sales performance. Every company is trying to provide a better and easy customer services for their valuable customers over the phone or online via the internet. As a result, conventional yoga centers are becoming more expensive and impossible to serve the yoga proper practices schedule as user's expectation. To make it easy and user friendly with less cost, everyone is trying to switch over a cheaper solution. In this context, user supports become very expensive and demanding which is gradually affecting the mobile application builder companies. The key to cure this ruin is by introducing a user friendly and cost less software, which can support in mobile phone user. Nevertheless, the vendor for fitness yoga application is becoming more demanding day by day. In order to support Small & Medium Enterprise (SME) in a competitive market, the application was designed in such a way that the system could solve the problem of excessive expenses and lack of time for supporting the users. The system was created as an economical approach towards the SME mobile application builder companies with all facilities

and of course with reliability. The project was done by using .NET framework, which is a well-known platform for security and reliability on any mobile application based systems.

Why Incremental model in the new system?

Even though a lot of models exist in cloud computing paradigm such as Waterfall model, Agile model and etc. Preference was given to Incremental model among them based on the following characteristics:

- The system development is broken into many mini development projects
- Partial systems are successively built to produce a final total system.
- Highest priority requirements tackled early on.
- Once an incremented portion is developed, requirements for that increment are frozen.

1.3 Introduction to Fitness Yoga Application

Before going to the discussion about fitness yoga application, it is necessary to clarify the main concept of yoga. It is required to simplify that what is the actual meaning of yoga in general sense and what does it mean for windows mobile platform?

According to the thesaurus, it means that to a system of exercises practiced as part of this discipline to promote control of the body and mind. On the other hand Fitness Yoga means Daily maintaining the healthy exercises (All-in-One). This is the World's Most Dedicated Yoga Coaching App, providing dynamic yoga sessions with different durations & difficulty levels. Elegant user interface and appropriate poses. It could be single or as a group.

What is Fitness Yoga Application?

The application includes all the general aasanas (poses) of yoga which any person of any age group can perform. The app includes aasanas for beginners, for intermediates as well as for experts. The aasanas have pictures with text description. These are the basic but good for health aasanas. This app has three major features that set it apart from the pack Every pose is modeled by a real person, includes useful textual and oral information about how to perform them, and individual pose pages include pictures of which muscle groups the pose engages. The interface is intuitive and includes impressive customizable settings like the duration of each pose in a routine.

The project was built based on mobile-based architecture, which was written in C# with Silverlight and XAML functionalities' [1].

1.4 Aims and Objectives:

1.4.1 Aims

The main aim of this project was to create a windows phone based fitness yoga application. In other words, a windows phone based application that would follow the principles of incremental model of software designing which completely provide the basic yoga poses of the different mobile industry's for their users support through mobile.

1.4.2 Objectives

In order to meet the goals of this project, a set of objectives were required to be laid out. The objectives to meet the aim were to-

- Conduct research into the most promising techniques of Incremental model,
- Explore different types of applications of mobile based as a runtime solutions,
- Design the model and software,
- Code the fitness yoga system and related algorithm to achieve the aim of this project,
- Test and evaluate the developed system,
- Integrate the system with other mobile platform and
- Write a Final Report along with a refined design, implementation and future direction of the project.

Learning objectives of the project were:

Understanding mobile apps incremental Model Architecture:

To understand how the runtime system and incremental model were created and implemented into a windows phone environment.

Using C# in mobile-based application:

To understand various runtime applications and clouding techniques that have already implicated in different existing software and to use secured and reliable technologies by the most prominent tools such as .Net Framework with C#.

1.5 Organization of the Report

The report arranges as follows, chapter one discusses the introductory parts of the project and gives a brief description of the overall exertion. Chapter two reviews previous researches and argued scholarly arguments and comments based on current context. It also presents the fundamental idea of mobile application and it's incremental model, and gives a clear vision why these are concerned in this project.

Chapter three develops the methodology of designing and architecting the project. To be more precise, it gives the conception of how to design objectives to achieve the goals. Chapter four is about the implementation of the system that was designed. Testing and evaluation chapter describes the whole testing strategy of the project and their results. Moreover, this chapter critically evaluates all the findings and outcomes. The last chapter presents a brief description of project management and draws concluding remarks.

Chapter 2

Literature Review

2.1 Previous Research and Overview

History of Yoga Research

Although yoga has been practiced for centuries in other parts of the world, most of the theory behind the practice has not yet been systematically studied using the rigorous tools of modern medical science. In the past several years, the scientific community has begun in earnest to seek out answers to some of the questions about yoga's efficacy as treatment for disease. However, as research on yoga begins to uncover some potential therapeutic benefits of yoga, the studies also underscore the inherent difficulties of systematically evaluating this multifaceted and holistic practice.

Granted, it is exciting to see a growing body of scientific research supporting the positive effects of practicing yoga. Nonetheless, it is important to recognize that not all yoga research studies are created equal. Before examining the most compelling yoga research findings, it is valuable to understand the key components that constitute a scientifically valid study.

Good Scientific Evidence

Despite the challenges of researching the health benefits of yoga, many good-quality studies are beginning to emerge and the results are interesting.

Strength and Flexibility

The principle of specificity in exercise science holds that a healthy body will adapt to the specific physical stressors placed upon it. With yoga's heavy emphasis on correct biomechanics and muscle stretching and strengthening, it is not surprising that some of the strongest evidence of the benefits of yoga has come from studies that measured strength and flexibility indices.

Wrapping It Up

At this time, the available body of scientific research on yoga as therapy for certain health conditions does not support any specific conclusions about yoga's practical application in disease prevention or treatment.

The good news is that there is now a push within the medical and scientific communities to design and support more rigorous studies of yoga's therapeutic role' [2].

2.1.1 Problems in Existing Service Based on mobile industry

About fitness yoga information and poses and maintaining these are maximum web based application. Where are not it easy to access these applications and it is impossible to access without internet connection.

In recent time there is some mobile based industry such as for android, Mac, windows operating system mobile has been developed fitness yoga application. But there are maximum application needs to connect internet through the mobile for use these applications.

Lack of proper information

In this time those application are developed based on mobile industry, has no sufficient task and information what to do and how it will be to do.

Lack of proper user interface design.

Interfaces are not interactive and not get advantage for users. They are maximum only shows the interface pages as an image.

Lack of data store capability

These fitness yoga application based on mobile they have no database for storing the user entering necessary information and doing task schedule work data.

Lack of result showing facility

In this time which fitness yoga application are developed based on mobile they have no facility to showing improving progress and suggestion for how to do for getting better or standard result for him/her. These applications have no intelligence as expectation of the users.

2.1.2 Comparison between Existing and Developed fitness yoga application

Comparison between existing and developed fitness yoga application based on mobile are shown in the table 1:

Table 1:- Different between existing and development fitness yoga application

Category	Existing fitness yoga application	Developed fitness yoga application
Internet connectivity	Need	Avoid
Working procedure information	Not available	Available
Data storage capability	Not available	Available
Progress showing capability	Not available	Available
Have Intelligence	No	Yes

2.2 Basics and Characteristics of Incremental model

The incremental model combines elements of the linear sequential model (applied repetitively) with the iterative philosophy of prototyping. The incremental model applies linear sequences in a staggered fashion as calendar time progresses. Each linear sequence produces a deliverable increment of the software. For example, word-processing software developed using the incremental paradigm might deliver basic file management, editing, and document production functions in the first increment, more sophisticated editing and document production capabilities in the second increment; spelling and grammar checking in the third increment and advanced

page layout capability in the fourth increment. It should be noted that the process flow for any increment can incorporate the prototyping paradigm. When an incremental model is used, the first increment is often a core product. That is basic requirements are addressed, but many supplementary features (some known, others unknown) remain undelivered. The core product is used by the customer (or undergoes detailed review). As a result of use and/or evaluation, a plan is developed for the next increment. The plan addresses the modification of the core product to better meet the needs of the customer and the delivery of additional features and functionality. This process is repeated following the delivery of each increment, until the complete product is produced' [4].

The incremental process model, like prototyping and other evolutionary approaches, is iterative in nature. But unlike prototyping, the incremental model focuses on the delivery of an operational product with each increment. Early increments are stripped down versions of the final product, but they do provide capability that serves the user and also provide a platform for evaluation by the user. Incremental development is particularly useful when staffing is unavailable for a complete implementation by the business deadline that has been established for the project. Early increments can be implemented with fewer people. If the core product is well received, then additional staff (if required) can be added to implement the next increment.

In addition, increments can be planned to manage technical risks. For example, a major system might require the availability of new hardware that is under development and whose delivery date is uncertain. It might be possible to plan early increments in a way that avoids the use of this hardware, thereby enabling partial functionality to be delivered to end-users without inordinate delay.

Model-Based Engineering (MBE) and Product Line Engineering (PLE) have been combined, to handle new system development constraints like: increasing complexity, higher product quality, faster time-to-market and cost reduction. As observed by some authors, the derivation of a product from product line shared core assets has been insufficiently addressed and can remain tedious in practice. We cope with this issue focusing on having a flexible and reactive model-based derivation, and propose an incremental evolution by extension of the product line coupled with this derivation activity. Process and tools bridge the gap between Application and Domain

Engineering introducing a semi-automatic feedback to benefits from the developments made in the Application Engineering. The approach is applied to a model-based product line dedicated to Class diagrams, and is tooled within the Eclipse environment. In below Figure 1 shows the Incremental Life Cycle Model:-

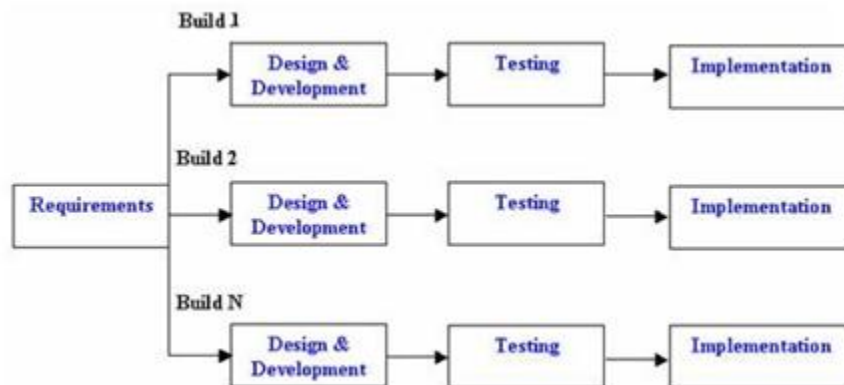


Figure 1:- Incremental Life Cycle Model

2.2.1 Benefits of Incremental model

- It requires less no of employees. So it is usable where staffing level is not high as in each increment a few people are involved.
- It is easy to control the technical management rise easily in this process of model.
- Maintenance cost is reduced as system is tested in every increment.

Chapter 3

Design

3.1 Environment Design

It is necessary to make it clear that this project was designed entirely based on conceptual and imaginary scenarios. To remind the readers of this report, there are many researchers who are still arguing about the core concept of different types of windows phone application. Some of them disagree with the concept of windows phone application. Their opinion is that this is nothing but renaming the new technology with new ideas.

3.1.1 Principles of Windows Phone Design

Windows Phone is a series of proprietary mobile operating systems developed by Microsoft, and is the successor to its Windows Mobile platform although incompatible with it. Unlike its predecessor, it is primarily aimed at the consumer market rather than the enterprise market. It was first launched in October 2010, with a release in Asia following in early 2011.

The latest release of Windows Phone is Windows Phone 8, which has been available to consumers since October 29, 2012. With Windows Phone, Microsoft created a new user interface, featuring its design language called the Modern design language. Additionally, the software is integrated with third party services and Microsoft services, and sets minimum requirements for the hardware on which it runs.

Microsoft Expression Blend offers a feature rich environment for designing highly interactive experiences on Windows Phone 7. In this report we will learn how to use Blend to create a Windows Phone 7 application using Silver light Controls, Behaviors, and the Navigation framework.

Expression Blend Provides Several Windows Phone templates:

Windows Phone Application: Generates a basic application with a single start page and header.

Windows Phone Data bound Application: Generates an application in a Model/View/View Model (MVVM) style, with sample data exposed in View Model classes.

Windows Phone Panorama Application: This template creates an application with the Panorama Control, which provides a multipage view of options with a parallax scrolling background.

Windows Phone Pivot Application: The Pivot control is much like a Tab Control, but tuned for a gesture-based interface. This template creates an application with the Pivot as its primary navigation.

Windows Phone Control Library: Enables you to create a collection of controls that you can reuse across several projects

3.2 Project Architecture and Design

In this section, the detailed architecture is described of this project. The following picture shows a typical environment of windows phone application. In Figure 2 shows the process model of Fitness Yoga Application:

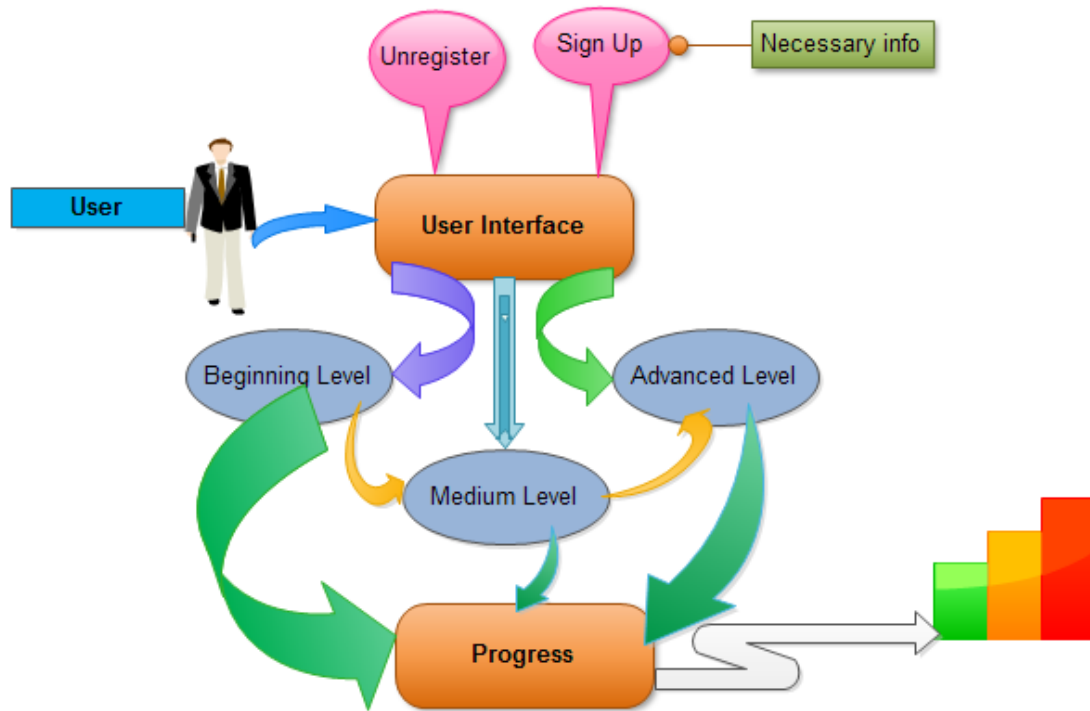


Figure-2: Understanding of fitness yoga application based on windows phone.

This Fitness yoga application was designed based on the above windows phone scenario. Here, it is visible that users are connected with provider in windows phone subscriber.

3.2.1 High Level Architecture

In this sub section of the document, the abstraction level of the project is described. The system is about virtualization which is the key technology of windows phone. That is why; the whole system is divided in 3 separate gears. They are given below:

✓ **Windows phone subscriber:**

This component was created as windows phone subscriber for this project. Yoga task to care fitness maintained user of Windows phone provider. This application was particularly created for the fitness yoga of the windows phone scenario.

✓ **Windows phone provider:**

This application was created as windows phone provider named instructor which is responsible for providing the Fitness yoga application to them who are subscribers.

✓ **User:**

Users are defined as they are customers of windows phone subscriber. They are typical people who are intended to be use this application of a fitness yoga named windows phone application for helping all kind of people.

In below Figure 3 shows the relation between 3 component of this application system:

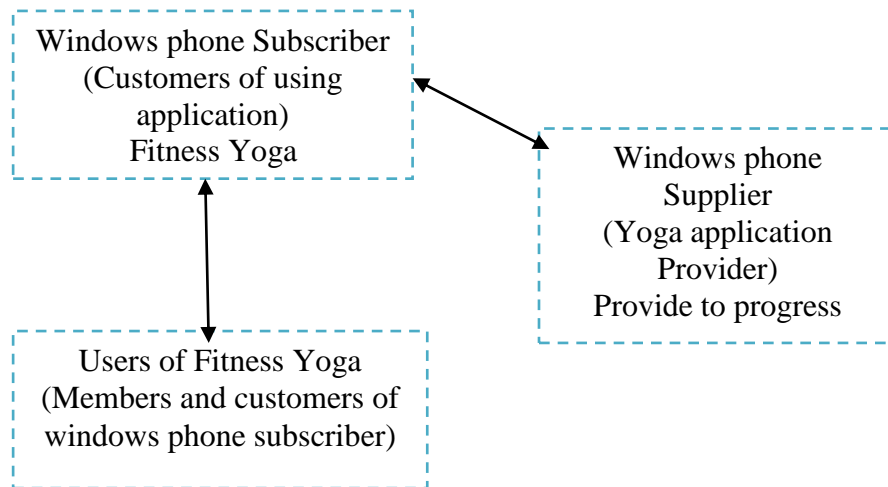


Figure:-3 Relations between 3 components of this application system

Figure 4 shows the high level architecture of the application presented:



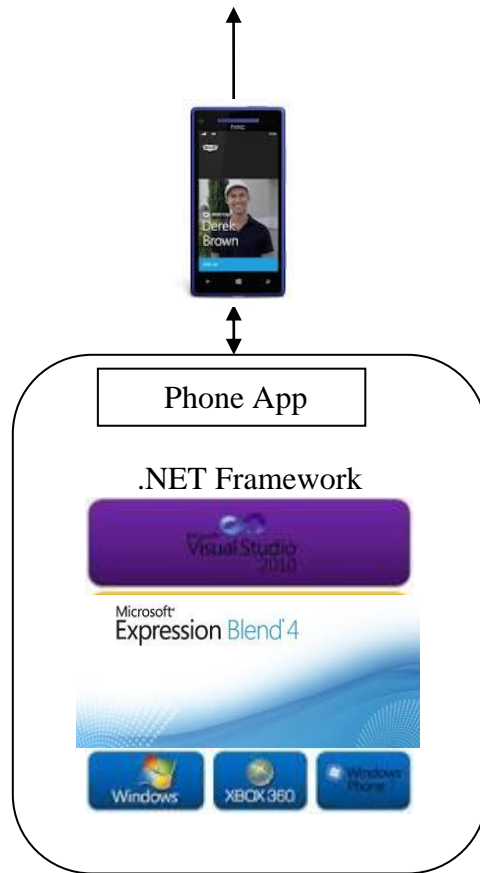


Figure-4: High level architecture of designed application

3.2.2 Application Design

3.2.2.1 GUI Design (See in Appendix C)

Graphical user interface (GUI) is a type of user interface that allows users to interact with electronic devices using images rather than text commands.

It is a well-known job of designing the fitness yoga application in a windows phone. For this reason, it was required to develop to provide the basic functionalities to the users and to create a application respect to the incremental model .

Yoga information and tips schedule in a technological way and to develop software which is user friendly, simple, efficient and cost-effective. It deals with the collection of user information and guided to the user about his/her fitness improvement. Traditionally these are done in by some poses in a gymnasium or following by any website. A non-profit organization named fitness yoga application was selected for demonstration, which was designed to provide a basic functionality of a windows phone application and provided application based help to their users. To do this, this application subscribed to a windows phone provider to facilitate the fitness yoga application. A basic phone application was preferred for fitness yoga.

There was a feature for the windows phone subscribers to be registered and start the practices as a phone provider.

3.2.2.2 Data Design

The underlying databases are the important components for running the task for fitness yoga application.

Three databases were designed to create the windows phone application. They are as follows:

1. Admin database: This database was designed to store necessary information for user forms.
2. User database: It was used for storing user entering information.
3. Super admin database: This database was responsible to handle basic information of subscribers such as name, address etc.

3.3 System Design

The main goal of the project is to design and development of a fitness application for Yoga based on Windows Phone.

Objectives:

- Create an mobile app for yoga
- Maintaining & storing user information into the database.
- Maintaining users' tasks schedule of Yoga Poses.
- Generating the progress based on tasks schedule job done by user.

To satisfy these basic requirements, a diagrammatic representation was generated.

3.4 Security Aspects and Risk Management

To design any system, it is the responsibility of the developer that the developer of the system should notify the possible vulnerabilities and how to manage them.

Possible vulnerabilities:

- Virtualization vulnerability:

The possible hacker could create the same virtual environment as this application offers.

Risk management:

- Secure Authentication:

This system has the procedure to authenticate the authorized persons. It powerfully checks the username and password. To start the yoga session, there was provided an additional form for authentication.

- Session management:

The system allows the functionality to maintain the proper session and has the power of not being session less. It also ensures to prevent SQL susceptibility.

Chapter 4

Implementation

4.1 Implementation

The ambition of this project was to create a fitness yoga application which follows the Incremental software model. This application should be able to allow the following functionalities-

- ✓ The application should be able to display the interfaces correctly and effectively.
- ✓ For the users of the application is able to register the necessary information.
- ✓ Users can be able to use this application in two ways with registration and without registration.
- ✓ The users should have the ability to perform the yoga session in runtime environment.
- ✓ To start the yoga session users (register) need to provide their user name and password for identification according to the database.
- ✓ For security and reliability, this application should maintain the session effectively.

In order to satisfy the above functionalities, the application should have the following capabilities:

- ✓ The designed application software should be concise, clear and easy to use.
- ✓ The users of this application should be able to get yoga progress as their requirement..
- ✓ Databases are required for registration and checking progress.
- ✓ The tools used to construct this application should be available.

According to the above situation, the tools that might have been chosen were Microsoft visual studio 2010, windows emulator, Silverlight for windows phone and SQLite database used.

After getting all resources available in Microsoft web site and the knowledge and skills about those materials, the following tools were selected to accomplish the project:

- Microsoft Visual Studio 2010 Express Edition:

It is an Integrated Development Environment (IDE) developed by Microsoft which can be used to develop, build and deploy applications such as web services, web sites, Windows Forms, windows phone application etc. This IDE was used to develop the whole system in this project.

➤ .Net framework:

The most important benefit of managed code is to our productivity. All other things being equal, the output of any process is limited by the scarcest resources. In software development, that resource is time, specifically developer time. Microsoft introduced its first version of the .NET Framework in July 2000 at a Professional Developers Conference held in Orlando, Florida. This was not the first time that the company had introduced a new technology to improve programmer productivity.

We have used this for runtime and code generation process that have resulted in startup time improvements as high as 50%.

➤ C# programming language:

It is an Object-Oriented (OO) Language developed by Microsoft which is similar to JAVA. This programming language was used for coding the necessary classes to execute the program.

➤ SQLite Manager:

It is one of the efficient and smart data platform developed by Oracle. This is used for design application database as an efficient way and it is a simple database which is appropriate for mobile application development.

4.2 Implementing Tools and Environment

To enable the environment of the solution, it is necessary to create the appropriate environment. Here, this application was created using Silverlight and windows phone emulator was used for simulating this application as a windows phone environment.

➤ **Necessary tools for enabling the environment:**

DOT NET Framework:

This framework supports Common Language Runtime (CLR) environment which is developed by Microsoft. It is necessary to enable the environment of implanting the system.

LINQ:

Language Integrated Query (LINQ) is an object relational mapping system developed by Microsoft. It was used because of it has faster access into databases which is developed by Visual Studio 2010 with SQL classes.

Enabling the Environment in windows phone:

The solution for this application was created by Visual Studio 2010 Express Edition. The operating system was Windows 7 -Ultimate Edition. For building the whole environment considering the mobile industry.

The solution could be deployed in any Windows Phone Platform which is supported windows phone application such as Nokia, HTC, Samsung, Sony and Smartphone.

4.3 Implementation of the Application

Microsoft Visual Studio is the prominent IDE for developing windows mobile applications. It generates necessary codes automatically. When a xaml interface was generated, the property generates automatically behind the file named xaml.sn It depends on the given name of the xaml item.

The following figure 5 shows a Default interface of the project at its first look:

```

<phone:PhoneApplicationPage
  xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  xmlns:phone="clr-namespace:Microsoft.Phone.Controls;assembly=Microsoft.Phone"
  xmlns:shell="clr-namespace:Microsoft.Phone.Shell;assembly=Microsoft.Phone"
  xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
  xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
  mc:Ignorable="d" d:DesignWidth="480" d:DesignHeight="800"
  x:Class="windowsPhoneApplication4.MainPage"
  FontFamily="{StaticResource PhoneFontFamilyNormal}"
  FontSize="{StaticResource PhoneFontSizeNormal}"
  Foreground="{StaticResource PhoneForegroundBrush}"
  SupportedOrientations="Portrait" Orientation="Portrait"
  shell:SystemTray.IsVisible="True">

  <!--LayoutRoot is the root grid where all page content is placed-->
  <Grid x:Name="LayoutRoot" Background="Transparent">
    <Grid.RowDefinitions>
      <RowDefinition Height="Auto"/>
      <RowDefinition Height="*" />
    </Grid.RowDefinitions>

    <!--TitlePanel contains the name of the application and page title-->
    <StackPanel x:Name="TitlePanel" Grid.Row="0" Margin="12,17,0,28">
      <TextBlock x:Name="ApplicationTitle" Text="MY APPLICATION" Style="{StaticResource PhoneTextNormalStyle}"/>
      <TextBlock x:Name="PageTitle" Text="page name" Margin="9,-7,0,0" Style="{StaticResource PhoneTextTitleStyle}"/>
    </StackPanel>

    <!--ContentPanel - place additional content here-->
    <Grid x:Name="ContentPanel" Grid.Row="1" Margin="12,0,12,0"/>
  </Grid>
</phone:PhoneApplicationPage>

```

Figure 5-: default.xaml

The following figure shows an auto generated code behind Default interface which is Default.auml.sn.

Chapter 5

Testing and Evaluation

5.1 Evaluation Criteria

Like any other windows phone based applications, the criteria for evaluating the system depends on how the developed system justifies the main concept of designing mobile application and how the whole system is accurate in a runtime environment.

This project was judged on the following set of criteria:

- Satisfying requirement specifications: The project is said to be successful if it satisfies all the requirements such as functional and non-functional requirements. In other words, it should be capable of ensuring the requirement specifications.
- Correctness: It is one of the critical requirements of software development. Perfectness is the basic demand for application oriented software. Each and every part of the software should work properly and accurately.
- Compatibility and Integrity: These are two significant conditions to check whether or not the project is successful. The Fitness Yoga application was created to be compatible with any .Net based windows phone. It was also designed in such a way that it could persuade the virtualization which is considered to be an important factor in windows phone platform. Additionally, the evaluation of the system depended on how the application was implemented to the whole system or not.
- Runtime management: The project is about the mobile application. So, it is necessary to maintain the runtime fulfilment.
- Reliability and security management: The security is one of the important factors in any service oriented systems. For this reason, the evaluating criteria on the security features that had been taken under account when the system was developed.
- User friendliness: Friendliness in any applications is also a special criterion to judge the systems. For instance, the users of this solution should feel contented when they are using the application.

In essence, a system should have the quality measures properties, such as efficiency, portability, reusability, flexibility, cohesion and loose coupling among different components of the designed software. The methodology for testing the system will discuss in the next section.

5.2 Testing Methodology

In general, software testing is used to find out system errors. A software test can be carried out by examining codes, design and execution of the whole system. Testing is inevitable to improve the quality of the system .To some extent, it is necessary for the verification and the validation (V & V) of a system.

In this project, Windows Phone Emulator was used for testing purposes. Manual testing (i.e. black box testing) such as checking outputs was also conducted to check the correctness of the system.

The configurations of the tester machine were as follows that is shows in Figure 6:

Hanjala's Laptop :

Table 2:- Configuration of testing machine

Windows Edition:	Windows 7 Ultimate
Processor:	Intel® Core™ i3-2350M CPU@ 2.30 GHz
Random Access Memory (RAM):	2.00 GB
System type:	32-bit Operating System

5.2.1 Unit Testing

Unit testing is generally used in a detailed designing and implementing phase of a project. The rationale of unit test was to find out the defects in this software .This type of test can be accomplished in two ways such as white box and black box testing. In this project, a Black Box testing system was used to find out the errors and the potential solutions of those errors. For the

Black Box testing, individual code module was used to check whether or not the system worked properly.

5.3 Results and Analysis

5.3.1 Unit Testing Results

For the unit testing, black box technique was used to test the individual components of the system. Each component was treated as a sealed box. The expected outcomes and actual outcomes from the test were compared to check whether there were any mismatches. If any differences were found then necessary actions were taken to fix up those errors. Table 3 shows test Schedule:

Table 3:- Test result schedule

Test Cases	Test Input	Expected Output	Actual Output	Result	Action
1.Interfaces Interface Visibility	Tested on Windows Phone Emulator	Interfaces are displayed correctly	All Interfaces are display correctly on Windows Phone Emulator	Pass	Tested on 21.01.2013 at 10:50 pm
2.User Login (For registered user)	The following user login cases were tested 1. Correct user name and correct password 2. Correct user name and wrong password	i) Should be show the yoga poses interface	i) Same as the expected output	i) Pass	Tested on 21.01.2013 at 10:53 pm
	 ii) Shows the message your entering user name or password is incorrect. Please enter the correct user name and password ii) Same as the expected output ii) Pass Tested on 22.01.2013 at 1:11 am

	<p>..... 3.Incorrect user name and correct password</p>	<p>..... iii) Shows the message your entering user name or password is incorrect. Please enter the correct user name and password</p>	<p>..... iii) Same as the expected output</p>	<p>..... iii) Pass</p>	<p>..... Tested on 22.01.2013 at 1:15 am</p>
	<p>..... 4.Wrong user name and password</p>	<p>..... iv) Shows the message your entering user name or password is incorrect. Please enter the correct user name and password</p>	<p>..... iv) Same as the expected output</p>	<p>..... iv) Pass</p>	<p>..... Tested on 22.01.2013 at 1:23 am</p>
	<p>..... 5.Press sign in button without entering user name and password</p>	<p>..... v) Shows the message your entering user name or password is incorrect. Please enter the correct user name and password</p>	<p>..... v) Same as the expected output</p>	<p>..... v) Pass</p>	<p>..... Tested on 22.01.2013 at 1:29 am</p>
<p>3.Users sign up for registration 3.1</p>	<p>3.1) Without entering any input pressed the sign up</p>	<p>3.1) showed this is a required field respectively</p>	<p>3.1) Same as the expected output</p>	<p>3.1) Pass</p>	<p>Tested on 22.01.2013 at 1:35 am</p>

<p>Checking for the registration page</p> <p>.....</p> <p>3.2) Checking for individual components of the Sign up form.</p> <p>i) Checking for User's full name</p> <p>.....</p> <p>ii) Checking for user name</p> <p>.....</p> <p>iii) Checking for user password</p> <p>.....</p> <p>iv) Checking for user password limitation</p>	<p>button</p> <p>.....</p> <p>i) %\$*&76a character given as user's full name</p> <p>.....</p> <p>ii) ka_hanjala cse-991</p> <p>.....</p> <p>iii) Entering different password in password and confirm password box</p> <p>.....</p> <p>iv) Entering more than 15 character in password box</p>	<p>to the different boxes. Please entering the information</p> <p>.....</p> <p>i) Shows a message Entering the unexpected character. Please enter only character</p> <p>.....</p> <p>ii) Shows a message user name should be less than 16 character</p> <p>.....</p> <p>iii) Shows a message mismatch the password</p> <p>.....</p> <p>iv) Shows a message password length is maximum 15 character</p>	<p>.....</p> <p>i) Same as the expected output</p> <p>.....</p> <p>ii) Same as the expected output</p> <p>.....</p> <p>iii) Same as the expected output</p> <p>.....</p> <p>iv) Not show a message</p>	<p>.....</p> <p>i) Pass</p> <p>.....</p> <p>ii) Pass</p> <p>.....</p> <p>iii) Pass</p> <p>.....</p> <p>iv) Failed</p>	<p>.....</p> <p>Tested on 22.01.2013 at 1:51 am</p> <p>.....</p> <p>Tested on 22.01.2013 at 2:12 am</p> <p>.....</p> <p>Tested on 22.01.2013 at 2:16 am</p> <p>.....</p> <p>Corrected the database conditional setting and the</p>
---	--	--	--	---	--

					conditional code in sign up page for message showing on 22.01.2013 at 3:56 am
--	--	--	--	--	---

5.4 Evaluation

The main ambition of this project was to create a fitness yoga application based on windows phone which can offer typical and basic functionalities of windows phone platform application.

At first the application was required to prove the basic principles of windows phone platform. To prove this in windows phone emulator which is described user validation and storing data to the database into the implementation chapter in this project.

This application would be fulfill the user demand. We weren't testing this application in a real scenario for that reason we was test this application by using Windows Phone Emulator. Overall, the testing was done to satisfy its goals and objectives in a satisfactory degree. Moreover, it provides a crystal clear impression of future rating of the system. Therefore, it can be said that, these tests were successfully satisfied evaluation criteria of this project.

Chapter 6

Conclusions

6. 1 Project Management

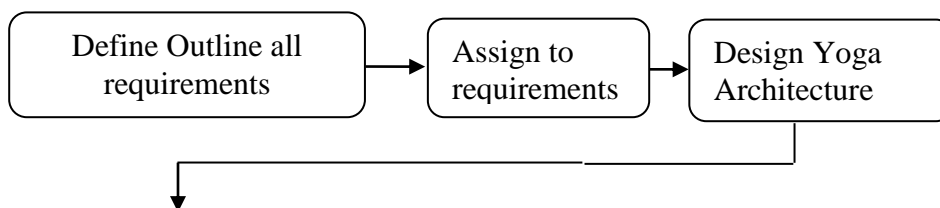
Windows phone is a new platform with a lot of possibilities in the mobile application industry considering the Nokia integration with Windows OS since 2012. Unlike others applications, our fitness yoga application has been designed in such a way that users can track and maintain log of his/her progress in daily routine. By this project, our fundamental understanding in software engineering has been developed. In addition, we have done a successful project in one of the most fast growing industry such as mobile apps.

To complete the project two main strategies were followed as stated below:

- Work Breakdown Structure
- Gantt Chart

6.1.1 Work Break down Structure

The project management for breaking down the workload of the application was done by Microsoft visual studio 2010. For creating this application, the main challenge was incorporating the appropriate concept to the detailed design. In order to design this application, the requirements are known. For this reason, throwaway incremental model was used. The whole work was divided in particular subtasks and tried to make clear the requirements of each tasks. As the requirements incremental model was introduced to complete the tasks. The rationale for this is that the project making time was limited. The incremental model is the best model for quickly identifying the requirements based on some assumptions. Figure 6 shows the incremental designing methodology of fitness yoga application:



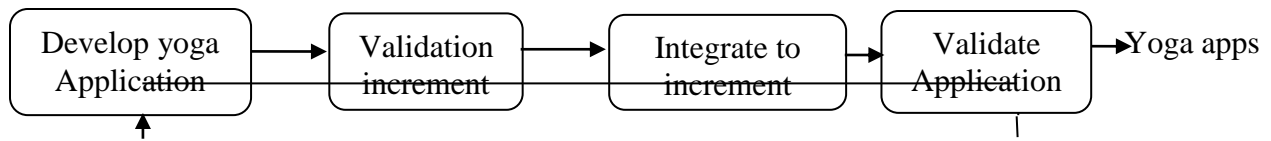


Figure 6-: Incremental designing methodology with fitness yoga application

The development of the system was followed by incremental model. That is why, for developing the fitness of yoga application and integrating the whole system, incremental model was used to make clear the requirements.

6.2 Shortcomings

The project was not free from shortcomings. There were three main limitations in the project:

- Time Constrain.
- Lack of resource availability.
- Lack of sample work based on Windows Phone

There are also some drawbacks in this application was it does not offer the users who have forgot his / her password. This facility could not be provided due to the lack of an email setup system to recover the password. Finally, a genuine storage was not used from mobile application. If it would have been in use, the windows phone application could be more visible and understandable to the users of this system.

6.3 Successes and Failures

The system is said to be successful in major cases. Because the system has the functionality of windows phone application system. Furthermore, the user interactions of mobile apps with different platform such as android and i-phone have also proved the success of the fitness of yoga and its application in runtime software. According to the implementation of the project, it has shown that the windows phone subscribers do not need to install the software on their own premises to support the customers. As a result, the subscribers do not need to have the related storages for mobile application. For this reason, the system also establishes a cost optimization

technique in a service based solution such as different companies could be served with the same code or program which also strictly follows the principles of incremental model. Nevertheless, this application is not free from its drawbacks. However, it can provide the basic idea of how to implement a window based yoga application in an existing system. To sum up, it can be declared that the project is successful in its principles.

6.4 Future Works

The future direction of the project could be implementing an intelligent agent for the fitness yoga application. However, this application could be designed in such way that it could be free from its weaknesses. In future we will include some intelligence technique and options in this application such as condition based pose and appropriate interactive feedback system. Where this application would be given the option to choose poses for fat lost or healthy. When any user needs to see his/her progress after completing any level, this application suggest what will be to do for getting a better progress by a message.

In addition, we will launch this application in Windows Market Place to achieve professional goal.

Appendix A: Typical Structure of Mobile Application

In Figure 7 shows the typical structure of mobile application:

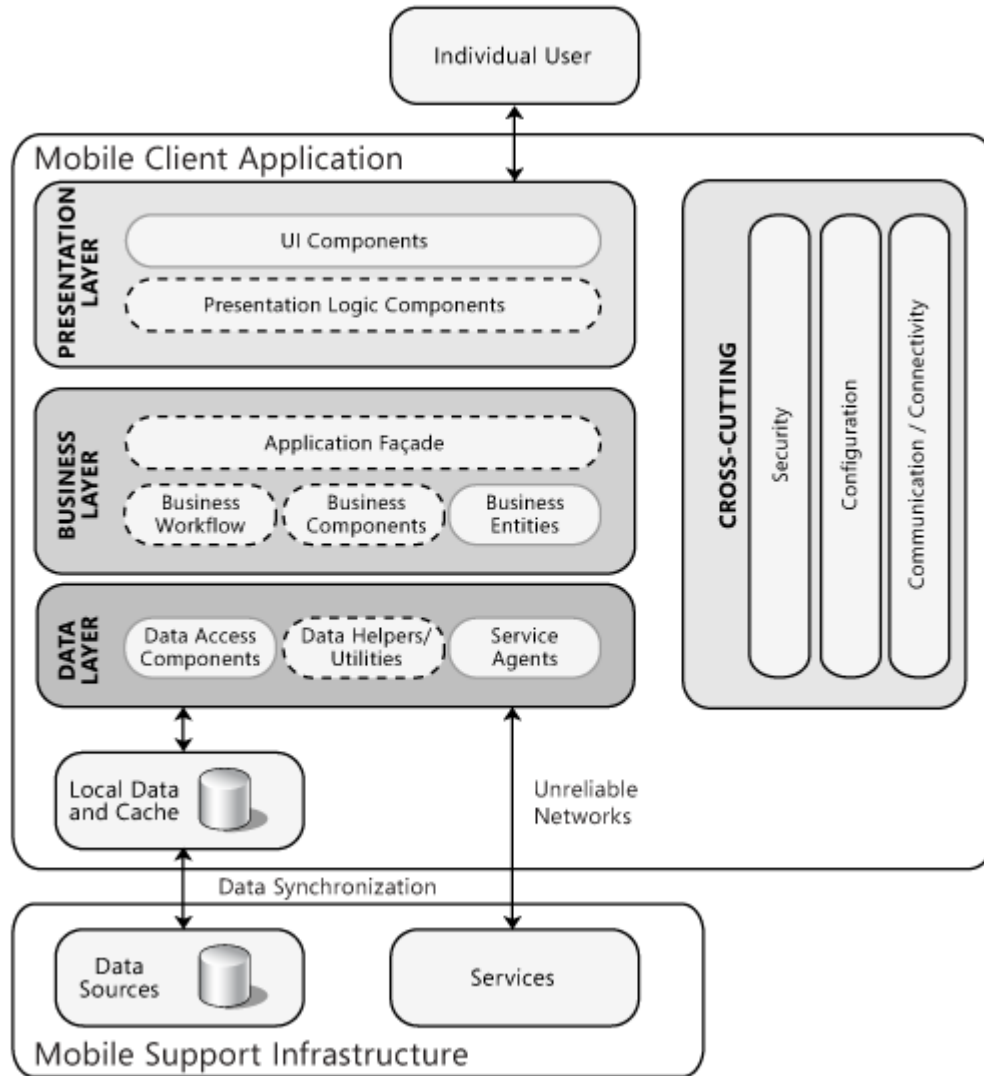


Figure: 7- Typical structure of a mobile application

A mobile application generally contains user interface components in the presentation layer, and perhaps may include presentation logic components. The business layer, if it exists, will usually contain business logic components, any business workflow and business entity components that are required by the application, and, optionally, a façade. The data layer will usually include data access and service agent components. In order to minimize the footprint on the device, mobile applications generally use less rigid layering approaches and fewer discrete components' [6].

Appendix B: Local Database Overview

In our project we used application's isolated storage container for storing relational data in a local database. Windows Phone applications use LINQ to SQL for all database operations, here Figure 8 shows the LINQ to SQL object model which is used to define the database schema, select data, and save changes to the underlying database file residing in isolated storage' [7].

LINQ to SQL object model:

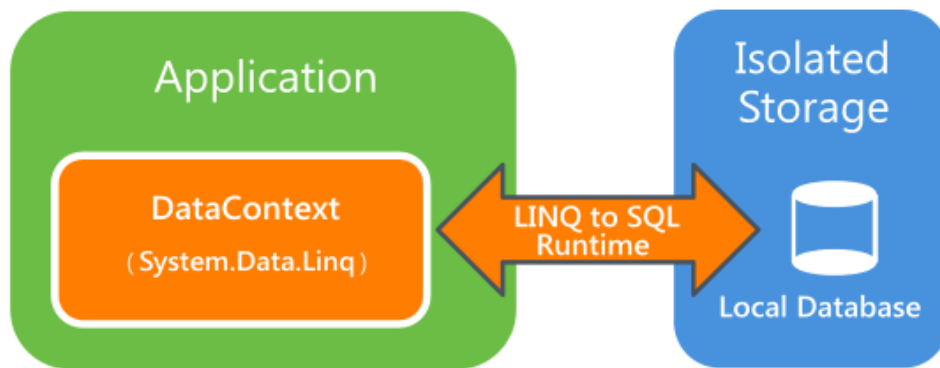


Figure: 8- LINQ to SQL object model

LINQ to SQL mapping attributes:

In our development of Fitness Yoga application there has been huge of attributes.^[3] In Table 4 shows some common LINQ to SQL mapping attributes:

Table 4: - LINQ to SQL mapping attributes

Attribute	Example	Description
Table	[Table]	Designates a class as an entity class that is associate with a database table

Attribute		
Column Attribute	[Column(Isprimarykey=true)]	Associates a class with a column in a database table Isprimarykey specifies the key, for which an index is created by default
Index Attribute	[Index(Columns="Column1,Column2 DESC",Isunique=true, Name=MultiColumnIndex")]	Written at the table level, designates additional indexes on the table each index can cover one or more columns
Association Attribute	[Association(Storage="ThisEntityRefName", Thiskey="ThisEntityId",Otherkey="TargetEntityId")]	Designates a property to represent an association, such as a foreign key to primary key association

Appendix C: GUI Design

i) Screenshots of sign in interface of Fitness Yoga Application:

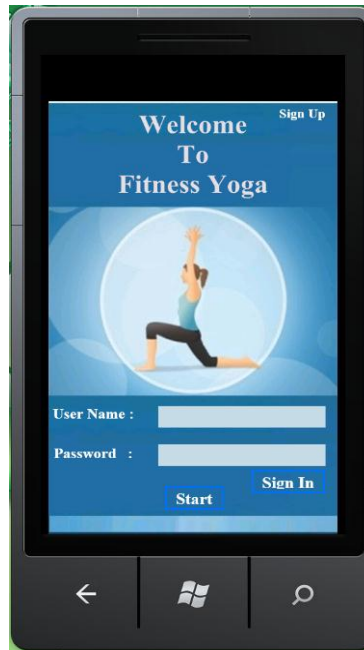


Figure 9: - Sign in interface

ii) Screenshots of sign up interface of Fitness Yoga Application:

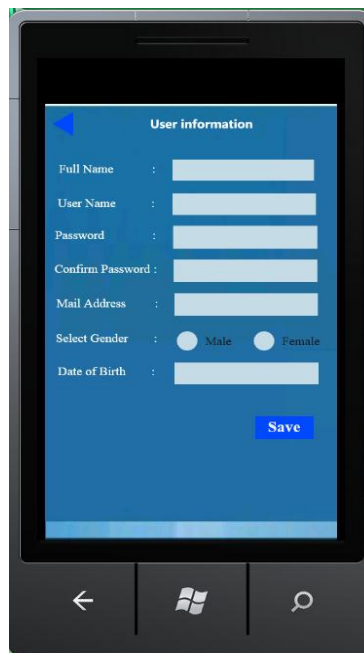


Figure 10: - Sign up interface

iii) Screenshots of choosing task interface of Fitness Yoga Application:

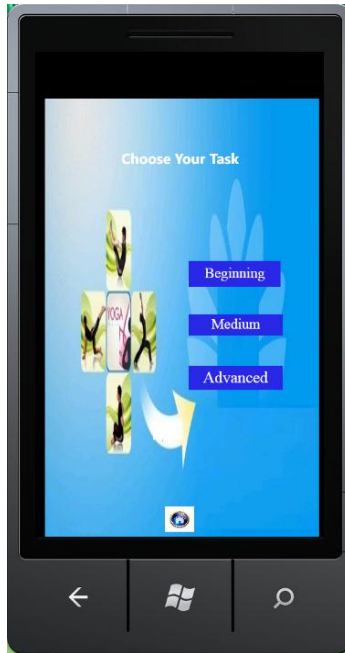


Figure 11: - Choosing task interface

iv) Screenshots of Beginning level pose 1 interface of Fitness Yoga Application:



Figure 12: - Beginning level pose 1 interface

v) Screenshots of Beginning level progress 1 interface of Fitness Yoga Application:

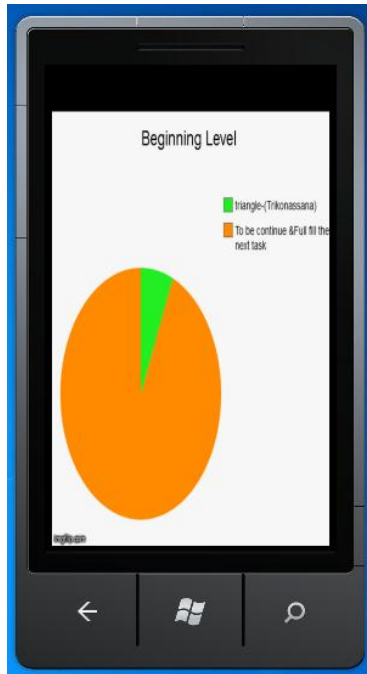


Figure 13: - Beginning level progress 1 interface

vi) Screenshots of Beginning level pose 2 interface of Fitness Yoga Application:

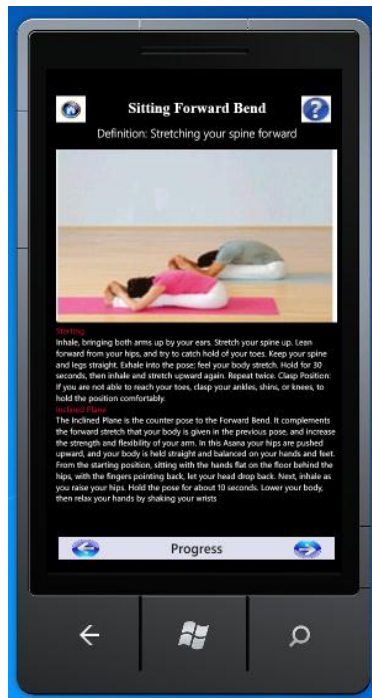


Figure 14: - Beginning level pose 2 interface

vii) Screenshots of Beginning level progress 2 interface of Fitness Yoga Application:

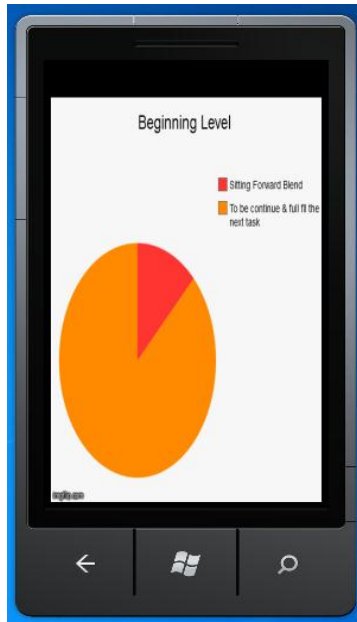


Figure 15: - Beginning level progress 2 interface

viii) Screenshots of Beginning level pose 3 interface of Fitness Yoga Application:

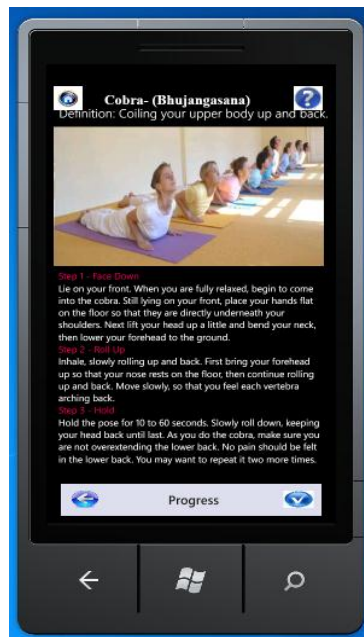


Figure 16: - Beginning level pose 3 interface

ix) Screenshots of Beginning level progress 3 interface of Fitness Yoga Application:

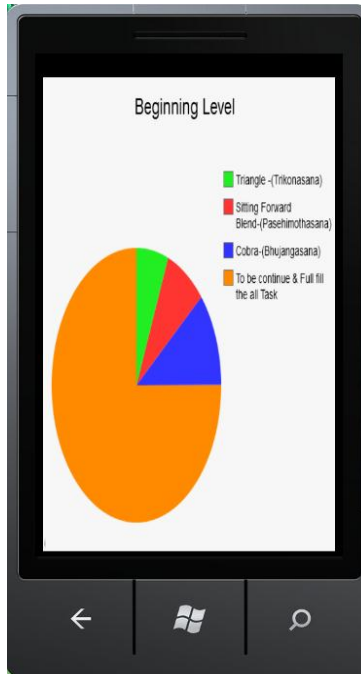


Figure 17: - Beginning level progress 3 interface

x) Screenshots of Medium level pose 1 interface of Fitness Yoga Application:

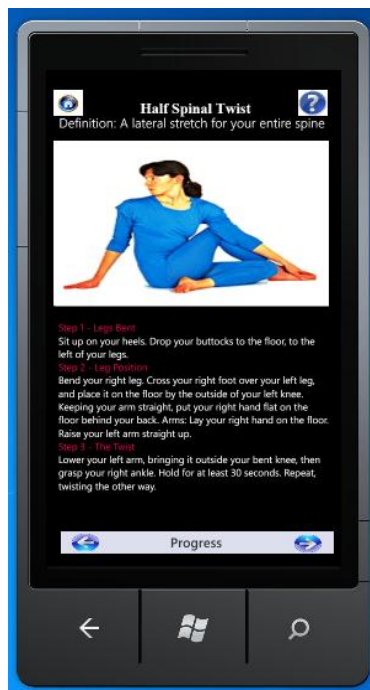


Figure 18: - Medium level pose 1 interface

xi) Screenshots of Medium level progress 1 interface with Beginning levels progress of Fitness Yoga Application:

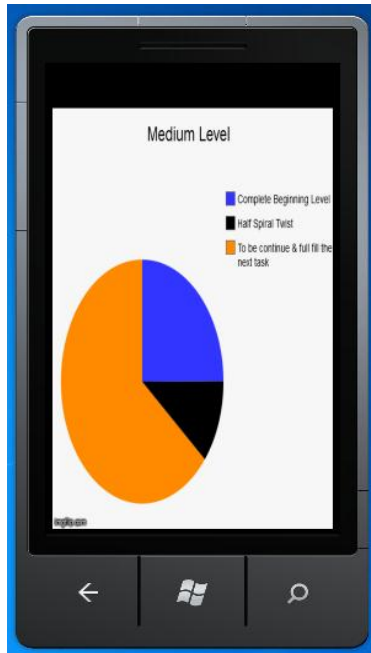


Figure 19: - Medium level progress 1 interface with Beginning levels progress

xii) Screenshots of Medium level pose 2 interface of Fitness Yoga Application:



Figure 20: - Medium levels pose 2 interface

xiii) Screenshots of Medium level progress 2 interface with Beginning levels progress of Fitness Yoga Application:

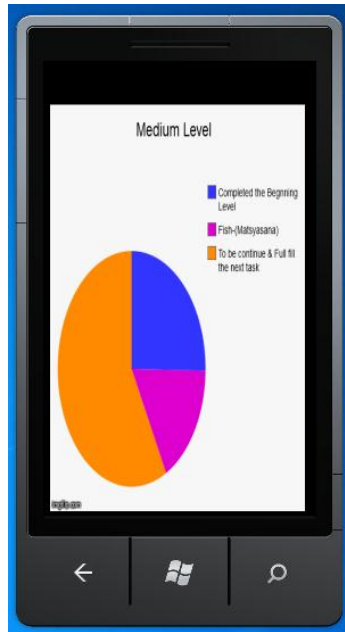


Figure 21: - Medium level progress 2 interface with Beginning levels progress

xiv) Screenshots of Medium level pose 3 interface of Fitness Yoga Application:



Figure 22: - Medium levels pose 3 interface

xv) Screenshots of Medium level progress 3 interface with Beginning levels progress of Fitness Yoga Application:

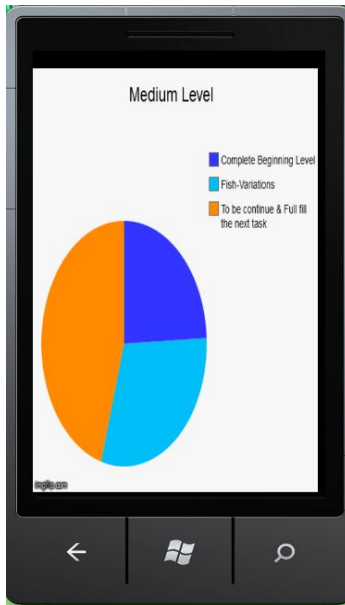


Figure 23: - Medium level progress 3 interface with Beginning levels progress

xvi) Screenshots of Medium level pose 3 interface of Fitness Yoga Application:



Figure 24: - Medium levels pose 4 interface

xvii) Screenshots of Medium level progress 4 interface with Beginning levels progress of Fitness Yoga Application:

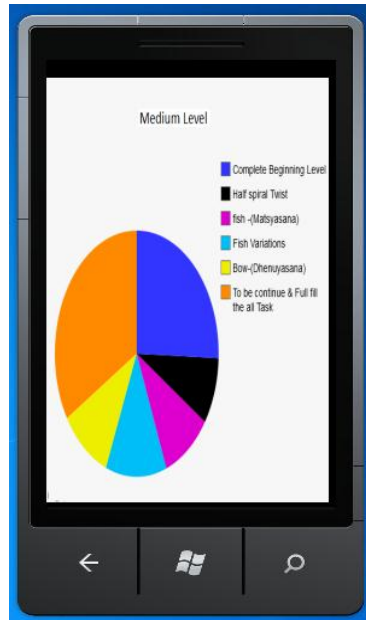


Figure 25: - Medium level progress 4 interface with Beginning levels progress

xviii) Screenshots of Advanced level pose 1 interface of Fitness Yoga Application:



Figure 26: - Advanced levels pose 1 interface

xix) Screenshots of Advanced level progress 1 interface with Beginning & Medium levels progress of Fitness Yoga Application:

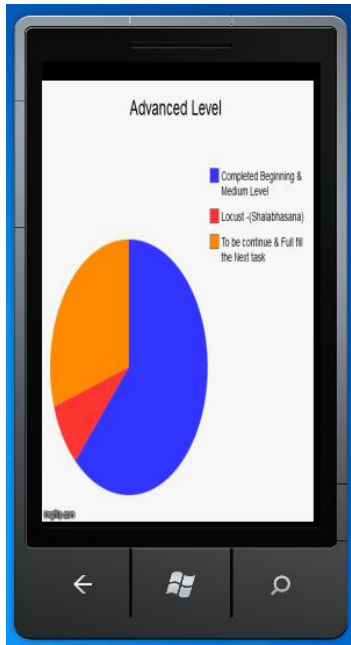


Figure 27: - Advanced level progress 1 interface with Previous levels progress

xx) Screenshots of Advanced level pose 2 interface of Fitness Yoga Application:

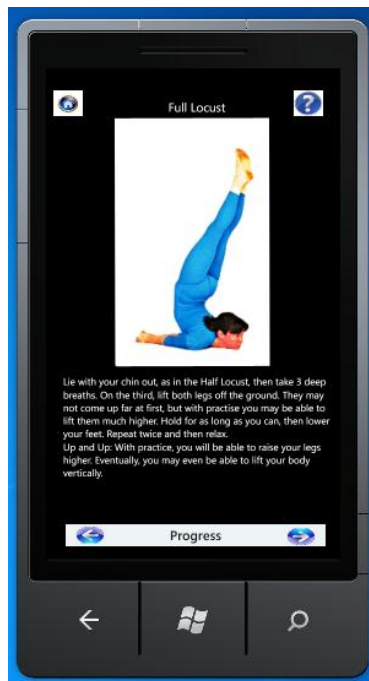


Figure 28: - Advanced levels pose 2 interface

xxi) Screenshots of Advanced level progress 2 interface with Beginning & Medium levels progress of Fitness Yoga Application:

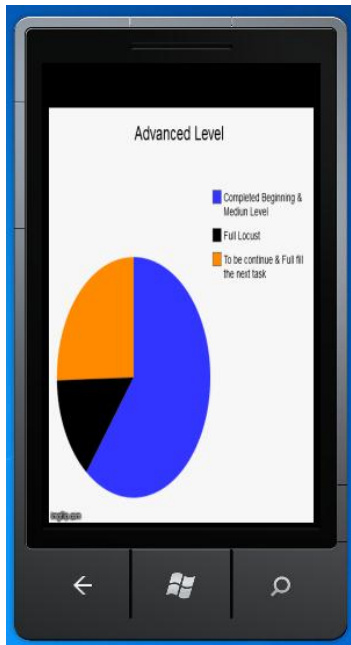


Figure 29: - Advanced level progress 2 interface with Previous levels progress

xxii) Screenshots of Advanced level pose 3 interface of Fitness Yoga Application:

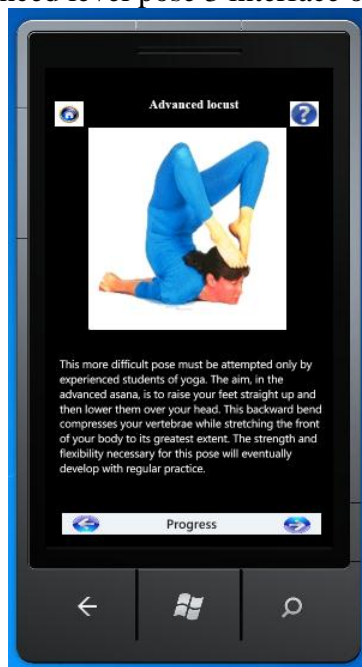


Figure 30: - Advanced levels pose 3 interface

xxiii) Screenshots of Advanced level progress 3 interface with Beginning & Medium levels progress of Fitness Yoga Application:

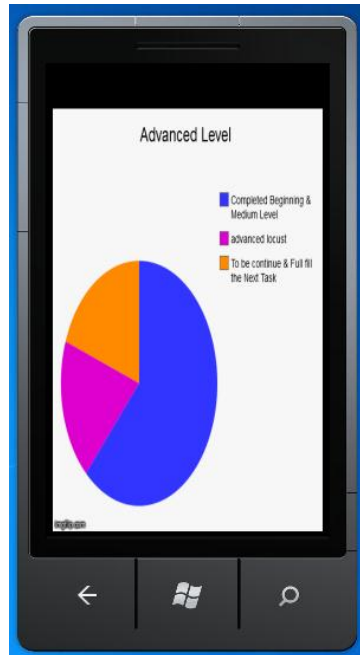


Figure 31: - Advanced level progress 3 interface with Previous levels progress

xxiv) Screenshots of Advanced level pose 4 interface of Fitness Yoga Application:

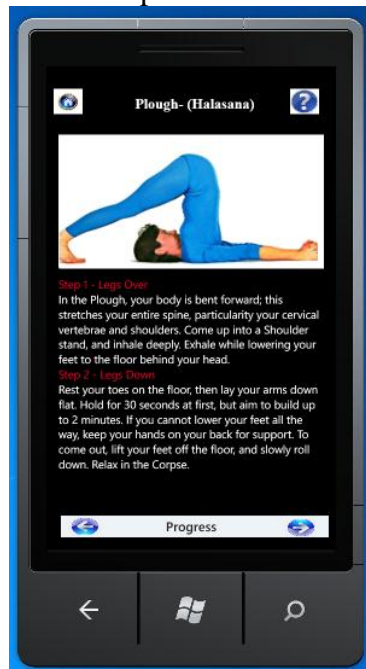


Figure 32: - Advanced levels pose 4 interface

xxv) Screenshots of Advanced - level progress 4 interface with Beginning & Medium levels progress of Fitness Yoga Application:

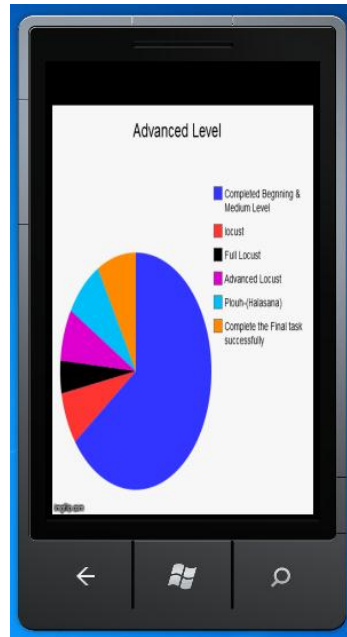


Figure 33: - Advanced level progress 4 interface with Previous levels progress

xxvi) Screenshots of Advanced level final pose interface of Fitness Yoga Application:



Figure 34: - Advanced levels final pose interface

xxvii) Screenshots of Advanced level final progress interface with Beginning & Medium levels progress of Fitness Yoga Application:

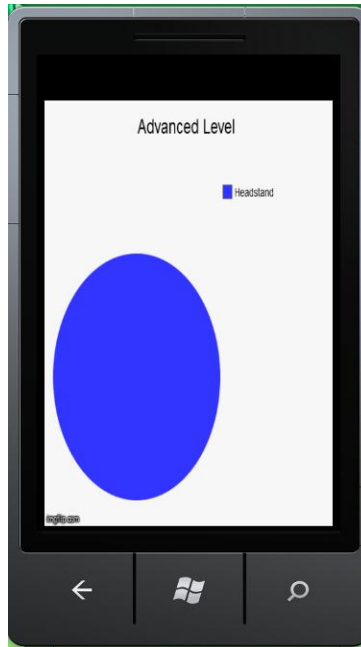


Figure 35: - Advanced level final progress interface with Previous levels progress

xxviii) All Task Completed Message interface:



Figure 36:- Task done message

REFERENCES:

- 1) http://www.windowsphoneapplist.com/en/Fitness_With_Yoga-a70241.html Accessed on 26 August 2012
- 2) <http://www.idealife.com/fitness-library/yoga-research> Accessed on 29 August 2012
- 3) <http://msdn.microsoft.com/en-us/vstudio/aa718325.aspx> Accessed on 03 September 2012
- 4) <http://soft-engineering.blogspot.com/2010/12/incremental-model.html> Accessed on 12 August 2012
- 5) http://www.zeepedia.com/read.php?incremental_model_evaluation_incremental_vs_iterative_information_systems&b=14&c=20 Accessed on 21 September 2012
- 6) <https://play.google.com/store/apps/details?id=com.dailyyoga.inc&hl=en> Accessed on 17 October 2012
- 7) <http://www.windowsphone.com/en-us/store/app/yoga-for-better-life/38ef7dda-0464-45d0-a594-5e7b5dd09616> Accessed on 05 December 2012