##### Synopsis

##### eExamination – Online Examination

###### *Submitted by*

###### <Student Name>

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**XXX Engineering College**

Mumbai University : Mumbai - 400001

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# 1. Problem Definition and scope of project

## 1.1 Introduction

Today internet become reality and usage of internet become very much popular and there is tremendous increase of internet in all over the world for education purpose. The Online Examination System is easy to use, full-featured and flexible Testing, Examination and Assessment web portal. It allows Administrators to set different examination and question banks for registered students and members. The eExamination System provides complete functionality of evaluating and assessing student's performance skills. The eExamination System comprises of Question Bank effectively blended with a whole set of Features. Using different features of the Examination System an administrator can set an exam name, select an examination, and assign questions for examination.

The question bank will form the backbone of the automated process and will play an important role in random generation of unique sets of question papers. The more the number of questions the better randomization is achieved.

Utilize advanced assessment settings, including flexible database driven question pooling, skipping, and randomization and timed response with feature to either conduct the conduct the exam on online. It facilitates in creation of question paper based on a set of parameters. eExamination System provides automated online evaluation of Objective type questions. For online exanimation, the answers are check along with the conduction of the examination and the examinee can be made available the results instantly. Storage of answers, scores, and results in database. Additional to the already available questions in the Question Bank, the Administrator has the ability to add more questions as per the subject.

System should have built in security features to handle different security threat like SQL injection, cross scripting, spamming.

This project report describes the software functional and nonfunctional requirements for release 1.0 of the eExamination system. This document is intended to be used by the members of the project team that will implement and verify the correct functioning of the system. Unless otherwise noted, all requirements specified here is high priority and committed for release 1.0.

## 1.2 Objective

Online Examination System – eExamination is complete end to end solution to cover all aspects of online examination system.

The basic objective of developing this project is:

* Provides complete web site solution, including member registration, giving tests, storing of results. Complete web based administration.
* The online examination system can automatically add the marks allocated in each question to determine the total mark for the test.
* Using this feature the questions can be selected from the question Bank, and also the appearance of questions in the Random Order.
* Add multiple product to shopping card, automatic calculate the shipping price, calculate tax and calculate total amount.
* Additional to the already available questions in the Question Bank, the Administrator has the ability to add more questions as per the subject.
* The Administrator also has the ability to modify the User-defined Questions and not the already Available Questions in the Question Bank.
* Complete web based system no installation required to run the application in client system.
* Student result must save and can be retrieving later on.
* Question must provide answer type like multiple right answer selection and one right answer selection. Test screen must provide options accordingly.
* System must able to evaluate the examination and display the result instantly, student must view the correct answer after complete the test.
* System has powerful logical access management in place, each user must be identified by login id and strict password policy is applied to secure the system
* Generate various reports for administration like, Total students/members registered for examination, no of available examination, test given by the student.

## 1.3 Project Scope

The eExamination System will permit to take and give online examination and maintaining master information and generating various reports of test. The main users of the project are Student or Member and system Administrator.

From an end-user perspective, the eExamination System Project consists of two functional elements: enhanced Member modules for registration, giving examination, manage profile. And Administration module for Mange members, examination, question bank and view the reports.

### 1.3.1 Member and Student Module

An enhanced interface for student to registration, edit profile, login, select examination, and give examination, view results, view answers Following modules pages are available for members.

**CM-1: Home –** It is the default page for the site. All links are available in this page.

**CM-2: Login –** Student need to login to view his account information and buy the product. If student forgets his password he can get back old password from Forget password link. New student can register for this site by click on register link.

**CM-3: Register** – New Student need to register to give examination. Type all the details of the student like email id, name, address, contact details and submit. System validate for email id, it should be unique. In login process student need to type email id and password. Student should type valid email id because if he forget password old password will be sent to this email address.

**CM-4: My Account** – It shows the details of currently logged student details, previously saved test results can be viewed here and other links like Edit Profile, Logout, and Change Password.

**CM-5: Edit Profile** – Student can edit his profile like personal details, address, contact no, display name however student can not edit email address once register.

**CM-6: Change Password** – Student can change his password from this link. Student must type his old password to change the password with new password.

**CM-7: Logout** – By clicking this link user logged out from this site all user session reset to default value.

**CM-8: Examination** – Student can view the available examination by selecting any examination from list, system display details of test like, examination name, description, total available question, number questions for test, total time, passing marks.

**CM-9: Test** – It display the test page, system randomly select questions from question bank and display one by one to the student. Student navigate the questions and select the right answer from available options, after complete the examination system display the results instantly and save the test details in system for future reference.

**CM-10: View Answers** – After completing the examination student can view the answer for each question.

### 1.3.2 Administration Module

Administration module used to enter and edit examination details, question banks, maintain the members and view the reports; The Web-based administration module will include the following features:

**AM-1: Login** – Login page for the administrator. All admin users are identified by the user name, password. Admin user can create new examination maintain question banks.

**AM-2: Members** – It show list of members registered in the site.

**AM-3: Examination** – Add edit the examination details.

**AM-4: Question Bank** – Maintain the question bank for selected examination, Administrator can add, edit the question and answers.

**AM-5: Results** – Display list of test results.

**AM-6: Logout** – By clicking this link admin user logged out from this site all user session reset to default value.

Both of these areas of functionality will be delivered as the first version of the eExamination Application for online examination system is released. Functionality is described in more detail later in this document.

## 1.4 Technologies

### 1.4.1 Operating Environment

OE-1: The eExamination web application will operate with the following Web Browsers: Microsoft Internet Explorer and Google Chrome

OE-2: The eExamination web application shall operate on a server running the latest versions of IIS (Internet Information Server).

OE-3: The eExamination web application shall permit user access from Internet connection

OE-4: Operating System: Windows 10

OE-5: Software requirements: SQL Server 2014, .net framework 4.5.

OE-6: Languages used are asp.net using c# and scripting is done using JavaScript.

OE-7: Hardware Requirements: 4(minimum)/8(recommended) GB RAM

OE-8: Hard disc- nGB depending upon the requirement to store data minimum of 25GB.

### 

### 1.4.2 Deployment Environment

DE-1: Database Server

OS – Win 2019 Enterprise Server

SQL Server 2014

HDD – Min 10 GB, Recommended 25 GB

RAM – Min 4 GB, Recommended 8 GB

Processor - Pentium Dual Xenon Processor

DE-2: Application Server

OS – Win 2019 Enterprise Server

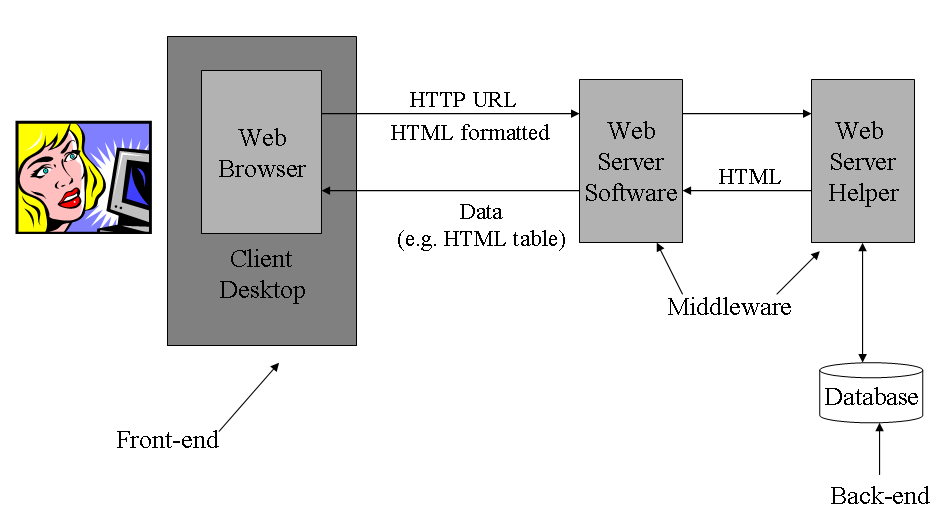
IIS – Internet Information Server

HDD – Min 5 GB, Recommended 10 GB

RAM – Min 4 GB, Recommended 8 GB

Processor - Pentium Dual Xenon Processor

DE-3: The eExamination web application will operate with the following Web Browsers: Microsoft Internet Explorer and Google Chrome



[eExamination System Architecture]

### 1.4.3 Development Tools and Technologies

**DT-1: ASP.Net**

As we need to develop Web Application for eExamination Application for Online Examination System. We will use ASP.Net as it is the new Microsoft technology to develop any application which support and integrate other server product for the internet. By ASP.Net we can develop in web application by .NET framework and manage environment with any .NET support language like VB.Net and C#.

**DT-2: C#**

.NET is built on the Windows Server System to take major advantage of the OS and which comes with a host of different servers which allows for building, deploying, managing and maintaining Web-based solutions. The Windows Server System is designed with performance as priority and it provides scalability, reliability, and manageability for the global, Web-enabled enterprise. The Windows Server System integrated software products are built for interoperability using open Web standards such as XML and SOAP.

.NET is a "Software Platform". It is a language-neutral environment for developing rich .NET experiences and building applications that can easily and securely operate within it. When developed applications are deployed, those applications will target .NET and will execute wherever .NET is implemented instead of targeting a particular Hardware/OS combination. The components that make up the .NET platform are collectively called the .NET Framework.

The .NET Framework is a managed, type-safe environment for developing and executing applications. The .NET Framework manages all aspects of program execution, like, allocation of memory for the storage of data and instructions, granting and denying permissions to the application, managing execution of the application and reallocation of memory for resources that are not needed.

The .NET Framework is designed for cross-language compatibility. Cross-language compatibility means, an application written in Visual Basic .NET may reference a DLL file written in C# (C-Sharp). A Visual Basic .NET class might be derived from a C# class or vice versa.

The .NET Framework consists of two main components:

Common Language Runtime (CLR)

Class Libraries

The advantage of C# includes

Powerful Windows-based Applications

Building Web-based Applications

Simplified Deployment

* Powerful, Flexible, Simplified Data Access
* Improved Coding
* Direct Access to the Platform
* Full Object-Oriented Constructs
* XML Web Services
* COM Interoperability

**DT-3: SQL Server 2014**

EExamination Application uses SQL Server 2014 as storing the data. Microsoft SQL Server 2014 as our database and it has so many features which is ideal for our dot net based application. Features Includes

* + Support for Multiple Platforms
  + Integration with Windows Back office servers
  + Integration with Microsoft .NET Enterprise Servers
  + Scalability
  + Replication
  + Centralized Management
  + Reliability
  + Automating Tasks

### 1.4.4 Development Environment

**DE-1: 1.Visual Studio 2015 IDE**

Most advanced integrated development environment for developing .NET application. Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It can be used to develop console and graphical user interface applications along with Windows Forms applications, web sites, web applications, and web services in both native code together with managed code for all platforms supported by Microsoft Windows, Windows Mobile, Windows CE, .NET Framework, .NET Compact Framework and Microsoft Silverlight.

Visual Studio includes a code editor supporting IntelliSense as well as code refactoring. The integrated debugger works both as a source-level debugger and a machine-level debugger. Other built-in tools include a forms designer for building GUI applications, web designer, class designer, and database schema designer. It allows plug-ins to be added that enhance the functionality at almost every level - including adding support for source control systems (like Subversion and Visual SourceSafe) to adding new toolsets like editors and visual designers for domain-specific languages or toolsets for other aspects of the software development lifecycle (like the Team Foundation Server client: Team Explorer).

Visual Studio supports languages by means of language services, which allow any programming language to be supported (to varying degrees) by the code editor and debugger, provided a language-specific service has been authored. Built-in languages include C/C++ (via Visual C++), VB.NET (via Visual Basic .NET), and C# (via Visual C#). Support for other languages such as Chrome, F#, Python, and Ruby among others has been made available via language services which are to be installed separately. It also supports XML/XSLT, HTML/XHTML, JavaScript and CSS. Language-specific versions of Visual Studio also exist which provide more limited language services to the user. These individual packages are called Microsoft Visual Basic, Visual J#, Visual C#, and Visual C++.

# 2. Overall Description

## 2.1 User Characteristics

### 2.1.1 Member

Able to register, login, edit personal information, results, select the examination, give test, view results and view answers.

### 2.1.2 Administrator

Administrator will have all the access rights. Administrator can create new examination, edit examination details, maintain the question bank, view the member and test results.

## 2. 2.Assumptions

1) System User and Administrator communicate with each other via emails.

# 3. System Features

## 3. 1.Systern features

### 3.1.1 .Description:

A web based eExamination application which will use to give and take examination over the internet. Proposed eExamination application system is end to end solution for online examination process includes member registration, selection of examination, give examination, view results, configuring examinations, maintain question bank, and generation of reports for the management.

### 3.1 .2.Constraints

Linking and integration with academic and institution system. Upload questions into system in different formats. Connecting to third-party OLAP applications for generating reports. Etc.

### 3.1.4 Action/result

|  |  |
| --- | --- |
| **Action** | **Result** |
| Member registers himself | After validation, naive users becomes registered Users. |
| User/Admin Logins via Login page | According to the access rights redirected to the accordance page. |
| Manage Question Bank (Admin) | Redirected to question page for add, edit question and answer. |
| Start new examination (Member) | Redirected to Start Examination page. |
| View Answers (Member) | Redirected to view answer page from result page |
| View Test Results (Admin) | Redirect to result page |

# 4. Preliminary Design

## 4.1 Use Case

eExamination Application 1.0 will address the following use cases. The complete usage scenarios will be completed during the information-gathering process. Use cases will be created and prioritized. Selected use cases will be expanded into usage scenarios and features that are derived from both use cases and the usage scenarios, as represented in the following diagram:

Students

Administrator

[eExamination Usage Scenario – This usage scenario, or scenario for short, describes a real-world example of how one or more people or organizations interact with eExamination system.  It describe the steps, events, and/or actions which occur during the interaction.  This Usage scenarios indicating exactly how someone works with the user interface, or reasonably high level describing the critical business actions but not the indicating how they’re performed.  ]

## 4.2 Specification of actors

The following actors are defined so far in the analysis phase of the eExamination Application for Online Examination System development process.

### 4.2.1 Student

| Student | |
| --- | --- |
| Element | Details |
| Description | A student is a member of the eExamination system. |
| Examples | A Student select examination take the examination, view results online. |

### 4.2.2 Administrator

| Administrator | |
| --- | --- |
| Element | Details |
| Description | The Administrator is the person who can update all the information like examination and question banks. |
| Examples | Administrator updates the examination details, add new question and answers in the eExamination application. |

## 4.3 Specification of Use Cases

### 4.3.1 Use Case Student Registration

| Student Registration | |
| --- | --- |
| Element | Details |
| Actor | Student |
| Trigger | Student is not registered in the System and the student wish to register for a test. |
| Pre Conditions | Student’s Email ID is not listed in the system. Student opens the registration page, and the registration page is displayed. |
| Post Conditions | Student is registered in the system, the student is logged into the system, and the system menu is displayed. |
| Normal course | 1. Registration form appears on the screen 2. System increment the last registered Student ID by 1 to get the ID for the new student. 3. Student fill in the Student’s information including Email ID, Name, Adress(es), Phone number(s), 4. System update |
| Alternative courses | 3a. Not all mandatory data fields are filled  3a1.Student fills in the missing data fields |

**Use Case Diagram : Student Registration**

Student

[Use Case: Student Registration – This use case scenario, or scenario for short, describes how student will registered into eExamination System.  It describes the steps, events, and/or actions which occur during the interaction.  This Usage scenarios indicating exactly how someone works with the student registration interface. ]

### 4.3.2 Use Case. Mange Question Banks

| Mange Question Banks | |
| --- | --- |
| Element | Details |
| Actor | Administrator |
| Trigger | Add new question and answer for an examination |
| Pre Conditions | The question is not in the question bank, the administrator is logged into the system, and the system menu is displayed. |
| Post Conditions | The question and associate answers is in the question bank, the administrator is logged into the system, and the system menu is displayed. |
| Normal Event Flow | 1. The administrator open the question bank page form by choosing the menu item for this action 2. Administrator enters all necessary information about the question and answers in the system. 3. Administrator update the System by confirming the data entered into the registration form. 4. Administrator repeats the steps until complete entry for all questions. |
| Variations | 3a. Mandatory fields in the registration form are missing  3a1. The system reject the entry and system update with an error message about missing mandatory fields. |

**Use Case Diagram: Manage Question Bank**

Administrator

[Use Case: Manage Question Bank – This use case scenario, or scenario for short, describes how administrator will add new question and answer details into eExamination System.  It describes the steps, events, and/or actions which occur during the interaction. ]

### 4.3.3 Use Case. Examination

| EXamination | |
| --- | --- |
| Element | Details |
| Actor | Student |
| Trigger | Student wants to give an examination |
| Pre Conditions | The student must register into the system, the student is logged into the system, and the system menu is displayed. |
| Post Conditions | The examination is completed and result is saved and displayed. User is logged out from the system, and the system menu is displayed. |
| Normal event flow | 1. Student logged in. 2. Student selects the examination and start the examination.. 3. Navigate the question and answers, mark the answers 4. The system calculates the result and displayed the results. 5. Student logged out from the system. |
| Variations | 5a.The system check for the available question from question bank.  2a1.The system informs if found mismatch |

**Use Case Diagram: Examination**

Student

### 

[Use Case: Sales Registration – This use case scenario, or scenario for short, describes how student will give examination and view the results in eExamination system  It describes the steps, events, and/or actions which occur during the interaction. ]

### 4.3.4 Use Case. System Login

| System Login | |
| --- | --- |
| Element | Details |
| Actor | Student, Administrator |
| Trigger | The user wish to start using the system. |
| Pre Conditions | The user is not logged into the system. |
| Post Conditions | The user is logged into the system, and the system menu is displayed. |
| Normal course | 1. The user click the link for the eExamination application and a login page appear on the screen. 2. The user types his username and password into the form and press the login button. 3. The system confirms that the user is logged on. |
| Alternative courses | 2a. The user is not a valid user or the user name or the password is  mistyped.  2a1. The system reject login with an error message that express wrong  login name or password. |

**Use Case Diagram: System Login**

Student

System User

Administrator

[Use Case: System Login – This use case scenario, or scenario for short, describes how actors will perform login eExamination System.  It describes the steps, events, and/or actions which occur during the interaction. ]

## 4.4 Process Flow Chart

Start

Registered

Student Registration

Login

YES

NO

Examination?

View Account Status?

NO

View/Search Examination

View Account Status

Select Examination

Give Examination

Complete Examination?

View Results

View Answers

Logout

Stop

YES

YES

NO

NO

YES

# 5 ER Diagram

question\_master

answer\_master

member\_master

test\_master

1: N

Belongs to

1: N

Belongs to

1: N

Belongs to

exam\_master

Exam\_master

1: N

Belongs to

Belongs to

1: N

1: N

Belongs to

# 7 Data Dictionary

### 7.1 Table: answer\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | a\_id | int | Y |  |
| 2 | a\_qusetion\_id | int |  | question\_master(q\_id) |
| 3 | a\_answer | varchar(3500) |  |  |
| 4 | a\_rightanswer | int |  |  |
| 5 | a\_create\_by | int |  | user\_master(u\_id) |

[*answer\_master* table is used to store multiple answers for every questions, *a\_question\_id* is reference to question\_master table and link to each question]

### 7. 2 Table: exam\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | e\_id | int | Y |  |
| 2 | e\_name | varchar(50) |  |  |
| 3 | e\_description | varchar(250) |  |  |
| 4 | e\_total\_time | int |  |  |
| 5 | e\_no\_of\_question | int |  |  |
| 6 | e\_max\_marks | int |  |  |
| 7 | e\_pass\_marks | int |  |  |

[*exam\_master* table is used to store each examination details like name of examination, total marks, passing marks, *e\_id* is the primary key and used in *question\_master, exam\_master* tables as foreign key]

### 7. 3. Table: member\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | m\_id | int | Y |  |
| 2 | m\_emailid | varchar(50) |  |  |
| 3 | m\_name | varchar(50) |  |  |
| 4 | m\_password | varchar(50) |  |  |
| 5 | m\_address | varchar(150) |  |  |
| 6 | m\_country\_code | varchar(50) |  |  |
| 7 | m\_city | varchar(50) |  |  |
| 8 | m\_zip | varchar(6) |  |  |
| 9 | m\_createdate | datetime |  |  |

[*member\_master* table is used to storestudent/member details of the student it stores details of mem\_id, name, email id, contact details, login details]

### 7. 4 Table: question\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | q\_id | Int | Y |  |
| 2 | q\_exam\_id | Int |  | exam\_master(e\_id) |
| 3 | q\_text | Varchar(3500) |  |  |
| 4 | q\_type | Varchar(10) |  |  |
| 5 | q\_active | int |  |  |
| 6 | q\_create\_by | int |  |  |

[Table *question\_master* is used to store questiondetails, it stores record of question id, question text, question type wheter it is single selection or multiple choice. *q\_id* is the primary key and represent for the question in eExamination database]

### 7. 5. Table: test\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | t\_id | Int | Y |  |
| 2 | t\_mem\_id | Int |  | member\_master(mem\_id) |
| 3 | t\_exam\_id | Int |  | exam\_master(e\_id) |
| 4 | t\_exam\_date | Int |  |  |
| 5 | t\_total\_qst | Int |  |  |
| 6 | t\_total\_attempt | Int |  |  |
| 7 | t\_total\_right | Int |  |  |
| 8 | t\_total\_wrong | Int |  |  |

[Table *test\_master* is used to store examination result details, it stores record of for each successfully saved test results for all students.]

### 7. 6 Table: user\_master

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr.** | **Field Name** | **Type** | **Primary Key** | **Foreign Key** |
| 1 | u\_id | Int | Y |  |
| 2 | u\_name | Varchar(50) |  |  |
| 3 | u\_type | Varchar(50) |  |  |
| 4 | u\_password | Varchar(50) |  |  |
| 5 | u\_create\_date | Date |  |  |
| 6 | u\_changepassword\_date | Date |  |  |
| 7 | u\_lastogin\_date | Date |  |  |

### 

[Table *userter* is used to store login details for system user includes admin user]

## 7.7 Data Flow Diagram DFD

A data-flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. DFDs can also be used for the visualization of data processing (structured design). On a DFD, data items flow from an external data source or an internal data store to an internal data store or an external data sink, via an internal process.

### 

### 7.7.1 Context Level

Examination

Question Bank

Student

Results

This context-level data flow diagram first, which shows the interaction between the system and external agents which act as data sources and data sinks. On the context diagram (also known as the Level 0 DFD) the system's interactions with the outside world are modelled purely in terms of data flows across the system boundary. This context diagram shows the entire eExamination as a single process,

### 7.7.2 Level 1 (High Level Diagram)

Student

Examination  
Master

Question Bank

This level (level 1) shows all processes at the first level of numbering, data stores, external entities and the data flows between them. The purpose of this level is to show the major high-level processes of the eExamination system and their interrelation. A level-1 diagram must be balanced with its parent context level diagram, i.e. there must be the same external entities and the same data flows, these can be broken down to more detail in the level 1, e.g. the "Select Examination" data flow could be spilt into "View Details" and "View Results" and still be valid.

# 8. Future Enhancement

This project was developed to fulfill user requirement; however there are lots of scope to improve the performance of the eExamination Application for Online Examination System in the area of user interface, database performance, and query processing time. Etc.

So there are many things for future enhancement of this project. The future enhancements that are possible in the project are as follows.

* Linking and integration of other online educational web sites.
* Integration with university database through Web Services
* Connection to third-party OLAP applications
* In the area of data security and system security.
* Provide more online tips and help.
* To optimize the query which is embedded in the system.

# 9. Bibliography

## 9.1 Websites

Following websites are referring to create this project reports.

* <http://www.google.com>
* <http://www.microsoft.com>
* <http://www.programmer2programmer.net>
* <http://www.codeproject.com>
* <http://www.asp.net>
* <http://www.asp123.com>
* <http://www.wikipedia.org>

## 9.2 Books

Following books and ebook are used to complete this project reports.

* Mastering C# (Paperback)
* SQL Server Bible (Paperback)
* .NET Black Book (Paperback)
* Professional C#, 2nd Edition (Paperback)
* Professional ASP.NET (Paperback)
* MCAD/MCSD Self-Paced Training Kit: Developing Web Applications with Microsoft® Visual Basic® .NET and Microsoft Visual C#® .NET, Second Edition
* MCAD/MCSE/MCDBA Self-Paced Training Kit: Microsoft SQL Server
* Database Design and Implementation, Exam 70-229, Second Edition