Chapter 2
Review of Literature

2.1 Introduction

In the previous chapter, the significance of the problem of present investigation, objectives of the study and hypothesis etc is discussed in details. The present chapter is set apart for making a brief review of the related studies. A detailed review of the related studies have done to plan the present study, in selecting methodology, research tool, size of sample, sampling technique and statistical technique used.

The Phrase 'review of literature' consists of two words, Review and literature. The word literature conveyed different meaning from the traditional meaning. It is used with reference to the language. Here in research methodology the term literature refers to the knowledge of a particular area of investigation of any discipline which includes theoretical, practical and its research studies. The term 'review' means to organize the knowledge of the specific area of research to evolve on edifice of knowledge to show that this study would be an addition to this field.

2.2 System Development Life Cycle (SDLC)

Software Development Life Cycle (SDLC) is the collection of various steps which followed for the systematic development, design and maintenance of the software projects and ensure that all the user requirement is fulfilled with least amount of resource consumption [9]. These methodologies help us delivering quality product on the time and as per the client requirement. These SDLC model is suitable for specific kind of projects we cannot deploy one single model for all the software projects because every project having different requirement that's why we always collect user requirement before we select any kind of SDLC model for the project.

2.2.1 Phases of SDLC

SDLC stands for software development life cycle. It is consist of various phases which describes how to develop, design and maintain the software project ensuring that all the functional & user requirement, goals and objective are met. This helps in quality production and the customer satisfaction. In specific terms that are relevant to SDLC, since SDLC, or System Development Life Cycle, is a cyclical methodology, phases repeat, so changes can be made to the design in the next cycle.

Requirement analysis: In the requirement analysis phase of SDLC (Software Development Life Cycle) where the discuss with client about his needs regarding software development. The aim of this phase to grab out all the details of the project or we can say that requirement analysis phase is to capture the detail of each requirement and to make sure everyone understands the scope of the work and how each requirement is going to be fulfilled.

Design: The next stage of Software Development Life Cycle is the Design phase. During the design phase, developers and technical architects start the high-level design of the software and system to be able to deliver each requirement. The technical details of the design is discussed with the stakeholders and various parameters such as risks, technologies to be used, capability of the team, project constraints, time and budget are reviewed and then the best design approach is selected for the product.

Implementation: This is the phase where we actually implement all the requirements which are gathered from the client. In these phases coding is started as per the requirement of the client. In this phase every one start doing their work database administrator start making database programmers start coding the function or we can say modules' of the projects and

front end developer stat developing an interactive GUI as per the requirement of the software.

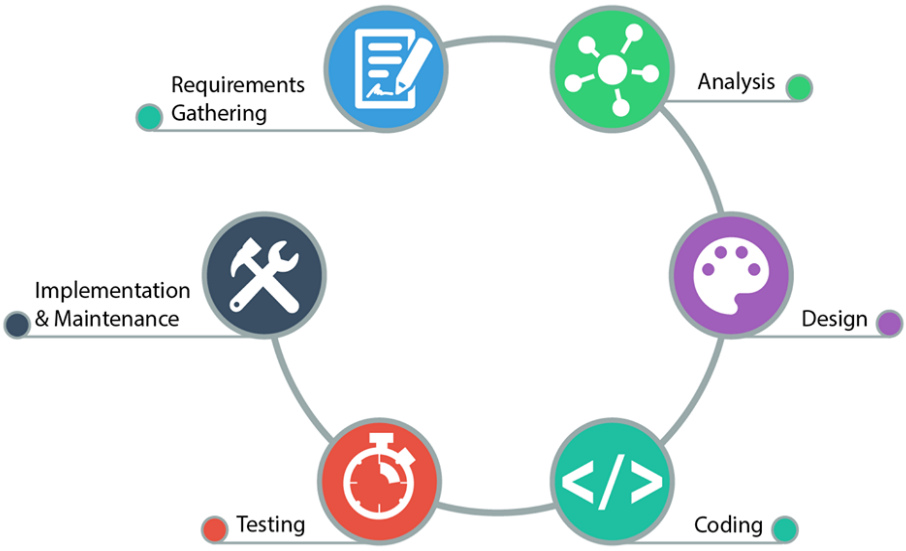

Fig 2.2.1 : Software Development Life Cycle (SDLC)

Testing: Testing is the last phase of the Software Development Life Cycle before the software is delivered to customers. In this phase we check that our software is working as per our expectation or not. We also check SRS that software full fill the entire requirement that mentioned by the client at the time of agreement.

Deployment and Maintenance: Once software development is completed we can deploy the software according to client use and we can provide there is usually a maintenance team that look after any post-production issues. If an issue is encountered in the production the development team is informed and depending on how severe the issue is, it might either require a hot-fix which is created and shipped in a short period of time or if not very severe, it can wait until the next version of the software.

2.2.2 Selection of Methodology (Agile Model)

We find out that our traditional models such as Waterfall, Spiral, Incremental and RAD is not able to fulfill clients satisfaction level so we move a head towards hybrid SDLC model development such as Agile process is itself a software development process [10]. Agile process is an iterative approach in which customer satisfaction is at highest priority as the customer has direct involvement in evaluating the software [11]. The agile model is hybrid model. It uses advantages of the both iterative and incremental model by dividing software product into apparatus where on each cycle or iteration, a working model of a component is delivered. This model delivers updated releases and each release contains some incremental updates and after completion of each iteration product is tested to ensure that the iteration is acceptable or not. The Agile model emphasizes association, as the clients, developers and testers effort mutually all through the project.

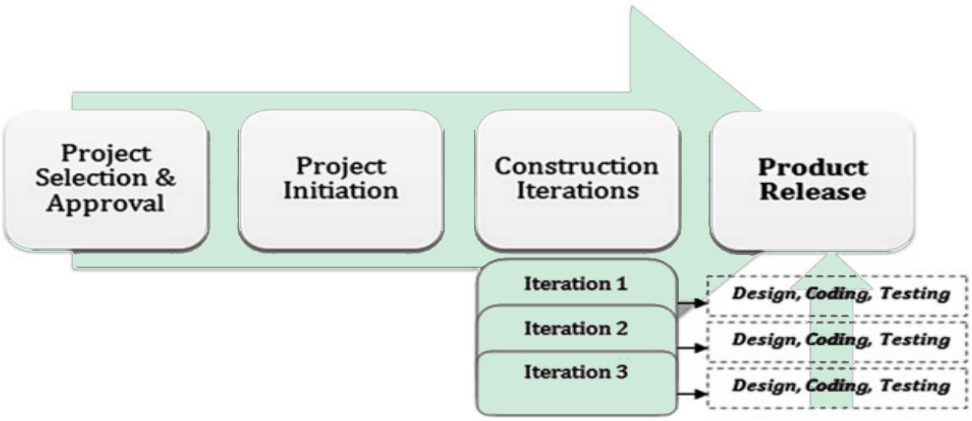

Fig 2.2.2: Agile Development Life Cycle

An benefit of the Agile model is that it rapidly deliver a operational product and is measured a very practical development approach. One drawback of this model is that because it depends profoundly on client communication, the project can head the incorrect way if the client is not clear about the needs or the direction he or she wants to go. Thus,

- This model is very adaptable to changing requirements
- Very much focused on client feedback.
- Dynamic measure of progress
- Overhead is reduced as compare to other model.
- Quick removal of horrific designs and erroneous requirements identified and removed immediately.
- Agile model works well for small team
- Small projects that are developed by small, self-organizing teams.
- Agile model adapt frequent changes in the technology.

2.3 Specification of Languages Used

HTML: HTML stand for Hypertext markup language. It is standard markup language for creating web pages and web application. Web browsers receive HTML documents from a web server of from local storage and render the documents into multimedia web pages. As Online Exam System is a web application HTML is used as markup language.

CSS: Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in markup language like HTML. CSS is a cornerstone technology of the world wide web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formating by specifying the relevant CSS in a separate CSS file, and reduce complexity and repetition in the structural content. Mainly external CSS is used in this project but there is a little bit inline css is used.

JavaScript: JavaScript often abbreviated as JS, is a high-level, interpreted programming language. Alongside HTML and CSS , JavaScript is one of the three core technologies of the world wide web. [12] JavaScript enables interactive web pages and thus is an essential part of the web applications. The vast majority of websites use it, all major web browsers have a dedicated JavaScript engine to execute it.

PHP: Hypertext Preprocessor (or simply PHP) is a server-side scripting language designed for Web development, and also used as a general-purpose programming language. Any PHP

code in a requested file is executed by the PHP runtime, usually to create dynamic web page content of dynamic images uses on websites or elsewhere. Most Web hosting providers support PHP for use by their clients. It is available free of charge, and the PHP Group provides the complete source code for users to build, customize and extend for their own use.

2.4 Specification of Frameworks and plugins

Bootstrap: Bootstrap is a free and open-source front-end framework for designing websites and web applications. It contains HTML and CSS based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. Unlike many earlier web frameworks, it concerns itself with front-end development only. We choose bootstrap because of-

- **Easy to use:** Anybody with just basic knowledge of HTML and CSS can start using Bootstrap.
- **Responsive features:** Bootstrap's responsive CSS adjusts to phones, tablets, and desktops.
- **Mobile-first approach:** In Bootstrap 3, mobile-first styles are part of the core framework
- **Browser compatibility:** Bootstrap is compatible with all modern browsers like Chrome, Firefox, Internet Explorer, Safari and Opera.

jQuery: jQuery is a fast, lightweight, "write less, do more" and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation and Ajax much simpler with an easy-to-use API thats works across as multitude of browsers. With a combination of versatility and extensibility , jQuery has changed the way that millions of people write JavaScript. It takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code. The jQuery library contains the following features:

- HTML/DOM manipulation
- CSS manipulation
- HTML event methods
- Effects and animation
- AJAX
- Utilities

DataTables: DataTables is a plug-in for the jQuery JavaScript library. It is a highly flexible tool, build upon the foundations of progressive enhancement, that adds all of these advanced features to any HTML table.

- Pagination
- Instant search
- Multi-column ordering
- Use almost any data source
- Easily theme-able
- Wide variety of extensions
- Mobile friendly

CLEditor: CLEditor is an open source jQuery plug-in in which provides a lightweight, full featured, cross browser, extensible, WYSIWYG HTML editor that can be easily added into any web site. It contains rich drop-downs for font name, size, style, text color and highlight color. CLEditor allows you to insert images, hyper-links and horizontal rules CLEditor provides a rich plug-in development environment, allowing you to customize its use interface and functionality to fit your needs

Chosen: Chosen is a jQuery plug-in that makes long, unwieldy select boxes much more user-friendly. All modern desktop browsers are supported.

CodeIgniter: CodeIgniter is a powerful open-source PHP framework with very small footprint, created by Rick Ellis in 2006.CodeIgniter was born from ExpressEngine essentially a collection of re-factored classes originally written for EllisLab's flagship CMS. Stripped of the application specific functionality, CodeIgniter was made to be a simple and elegant toolkit, enabling rapid development of both web sites and web applications, attracting thousands of talented PHP developers.

2.5 CodeIgniter MVC Framework

The era of rapidly evolving technologies currently provide a positive influence on development of web technology. One such technology is the framework. MVC is most popular framework currently.

2.5.1 Framework

Framework is a set of libraries that are organized in an architectural design to deliver the speed , accuracy , convenience and consistency in the development of such applications , the framework contains the following elements :

- Architecture
- File library
- Methodology

If this framework is associated with the word PHP , it can be interpreted as a patterned framework that enables easy web development using PHP language

2.5.2 MVC architecture

MVC is used to separate the data access and business logic from the data presentation and user interaction . Separation was done so that any changes in the presentation logic or business logic does not give effect to each other are complex . MVC separation solution is expected to improve the flexibility and re-usability of the application . The MVC architecture separates applications into three parts, namely Model, View and Controller:

Model: A representation of a database, including the design table to the relationships that exist between tables. The main function of the model is to handle the data,, retrieve data from the database, insert data into the database, data manipulation through data validation.

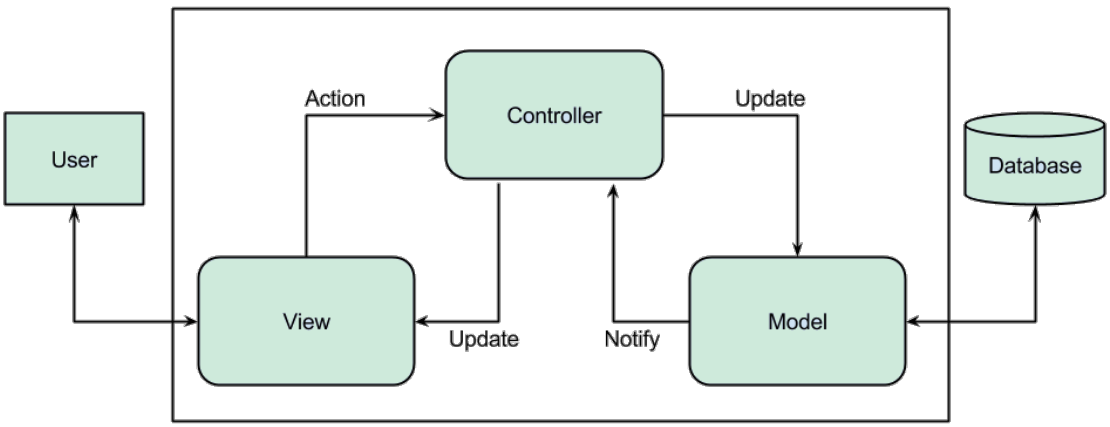

Fig: Model View Controller Architecture

View: View to render the given data model and will transmit motion/activity from the consistency of data display to the changes that occur. By grouping all the display and presentation code in one place, will make it easy to change the look without affecting the business logic and data .

Controller : The controller defines the behavior that occurs in the application, and then mapping them into action from the user to the model. The controller will be very closely related to the View, because each user interaction to be performed will be shown by the View to a response by the Controller. In the controller there will be those methods that will respond to the behavior of the application .

2.5.3 CodeIgniter Framework

CodeIgniter is a web application framework that is open source used to build dynamic PHP application. The main purpose is to assist the development of CodeIgniter developers to work on application faster than writing all the code from scratch. CodeIgniter introduced on February 28, 2006 [13]. Characteristics of CodeIgniter is as follows:

- It has the characteristics of flexible and lightweight for ease in learning, modifying, and integrating Library and Helper.
- Using the MVC pattern so that the structure of the generated code is more structured and have clear standards.
- Produced very friendly URLs. In Code Igniter minimized use $ _GET and replaced with a URL.

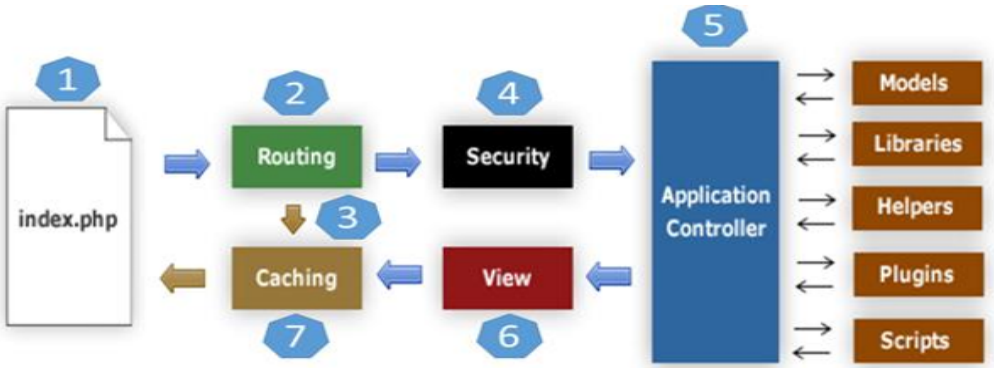

Fig: Structural work of CodeIgniter

Structure of CodeIgniter work starts from a browser which will interact via the controller . Then the controller will receive and reply to all requests from the browser . For data , the controller will ask for the model and for the UI / template controller will ask to view . When a browser requests a web page then the router will find the controller which should handle the request . later the controller will use to access the data and the model view to display the data.

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