Chapter 4

Approach for Developing Newspaper Circulation and Sales Forecasting System

4.1 Introduction

Chapter three is on technology that adopts to solve the research problem. Following technologies used for solve the research problem, such as PHP, MYSQL, WAMP Server, WEKA data mining software and data mining techniques. In this chapter describe how chapter three mention technologies use to solve research problem.

4.2 Approach of the System Development

Software development life cycle (SDLC) is a process that used in software project. This the full detail plan for system development stages such as planning, defining, designing, building, testing and deployment. SDLC helps to improve overall quality of the software as well as process of the development process. Currently software industry used several SDLC models such as Waterfall model, Iterative model, Spiral Model, Agile Model and RAD Model, etc [33];

Waterfall model is used as software development approach for developed the Newspaper Circulation and forecasting system. Mainly this approach phases are completed step by step. Outcome of the one phase is a input of the next phase. Therefore, development processes easily understand, review each stage separately and assure the accuracy. Each step has specific deliverable and scheduling is easy [34]. As well as this model is more suitable for this project because requirements are very clear and not change, problem clearly identify and technology is not dynamically change.

Figure 4.1 represent the different phases of the waterfall model.

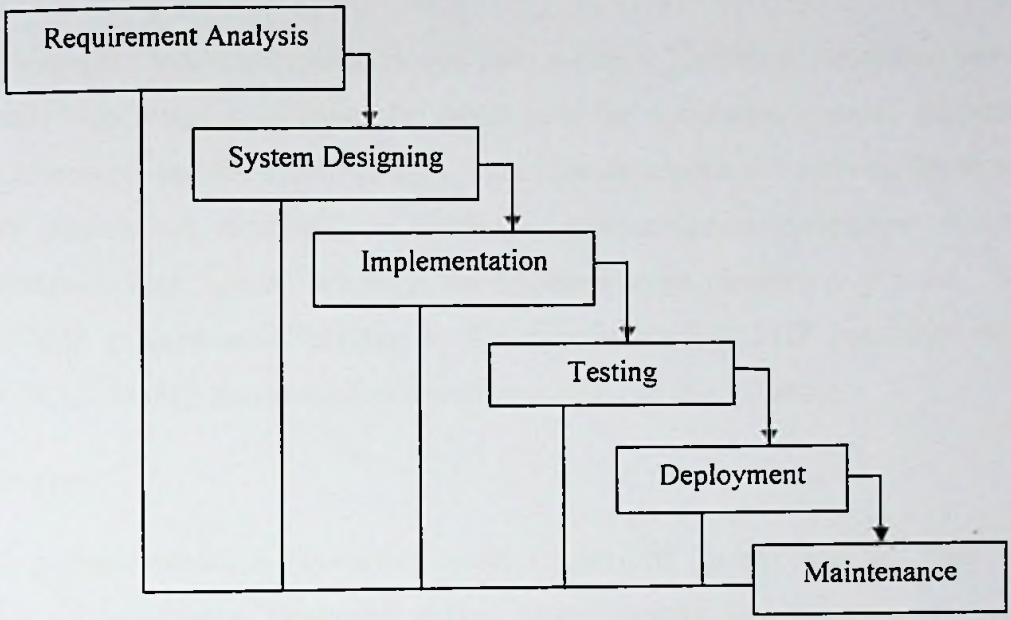

Figure4. 1: Waterfall Model [34]

4.3 Circulation Module Development

Requirement Analysis-

Conducts interviews with circulation department staff, accounts department staff and observe their process this research project mainly gather the requirements. Then analyzed the data and this research project identified circulation process have three main sub process such as newspaper issuing, return handling and payment handling. Therefore, this system need develop three sub modules to handle above mention three sub processes.

System Designing-

According to the requirements researcher design the system. This system mainly web base solution that need to integrated database. System designing researcher used following diagrams such as system high level diagrams, data floor diagrams, use case diagrams etc; Then designing the database by using ER diagram.

Implementation-

Newspaper Circulation system is web base solution. Therefore, researcher used PHP5 server side scripting language for developing the circulation system. According the requirements and the system design researcher developed the system. Three separate sub module are developed to handle newspaper issues, newspaper returns and payments. This module integrates for handle smooth circulation process. MySQL RDBMS is used as a database in this system because PHP smoothly runs with MySQL. WAMP Server used as a web server for run this solution.

Testing-

After implementation researcher needs to perform proper testing. That need to conduct unit testing, integrated testing, system testing and finally user acceptance testing. Therefore researcher needs to create some test cases.

Deployment-

Completing functional and non functional testing system deployed the client environment.

Maintains-

Release patches when some issues arise after the deployments or enhance the system by releasing new versions.

4.4 Sales Forecasting Module development

Requirement Analysis-

Interview with circulation department staff and management and identified their sales forecasting requirements. Basically they need to know agency wise paper sales, required total print quantity in each paper by particular date etc; As well as management needs to get idea about performance of the agents, customer movements between agents, district wise sales etc; This stage researcher analysis the forecasting techniques, available forecasting tools and their features. According to finding researcher identified the WEKA data mining software is more suitable tool for addressing the research problem,

Designing-

Researcher designs the forecasting process and expected outputs of the sales forecasting module. As well researcher designs the data set that used for predictions. Designing the data set is more importance. This research considers previous three years net sales information. Data set include net sales quantity of particular newspaper in particular month belongs to particular agent.

Implementation-

This research use Waikato Environment for Knowledge Analysis – version 3.7.13 (Weka 3.7.13) data mining tool and packaged called Time series forecasting environment that used for build the forecasting modules and performing the predictions. Weka is java based tools therefore researcher needs implement the java virtual machine version 1.7.After the input the data set then need to preprocess the dataset and remove the garbage values and generated Attribute-Relation file format (AEFF) that support to Weka. Then using time series forecasting techniques that already build in weka such as Gaussian, Linear Regression, Multilayer Preceptron Regression and SMO Regression researcher can predict the newspaper sales forecasting.

Testing-

Consider the forecasting values and actual data research may identify the accuracy of the predications that maid by each forecasting techniques, then researcher can select more accurate technique that uses for newspaper sales forecasting. However, Weka has in build testing and evaluation algorithms that helps to check the accuracy of the forecasting techniques that used for sales forecasting. The following are the example of the available techniques such as Mean Squared Error (MSE), Mean Absolute Error (MAE), Root Mean Squared Error (RMSE) and Relative Absolute Error (RAE).

Deployment-

After identify the accurate sales forecasting technique researcher can deploy the system with required forecasting features in client site.

Maintains-

Time to time system need to be upgrade by introducing more accurate forecasting techniques.

4.5 Summary

Researcher use waterfall model as system development life cycle for develop the Newspaper Circulation and forecasting system. This system has two main module such as Circulation module and forecasting module. Circulation module has three sub modules such as newspaper issue handling, returns handling and payment handling. This system developed as a web base system by using PHP, MySQL used for handling database and WAMP server used as a web server. After implementation researcher need to conduct proper testing mechanism. In forecasting this reach used Weka 3.7.13 data mining tool that include time series forecasting package that allowed to perform time series related forecasting mechanism by using Gaussian, Linear Regression, Multilayer Preceptron Regression and SMO Regression and predict the newspaper sales forecasting. Then use of testing and evaluation algorithms that available in Weka, (Mean Squared Error (MSE), Mean Absolute Error (MAE), Root Mean Squared Error (RMSE) and Relative Absolute Error (RAE)) researcher identify more accurate forecasting technique that use for newspaper sales forecasting. Next chapter discussed about details of the designs about Newspaper circulation and forecasting system.