Chapter 3

Technology Adapted

3.1 Introduction

After analyzing the background of the project as discussed in previous chapter, technical knowledge can be used for such system has to be identified by the developer to fulfill the target of the product. The verities of the technologies were identified which can be used for IPS-IRD system, will be discussed in this chapter.

Mainly the technologies were adapted under following categories.

- System analysis & design
- System life cycle management
- Programming language
- Database environment
- Web severs

3.2 System analysis & design methodologies

3.2.1 Object oriented analysis & design (OOAD)

This model is an approach to software design where the fundamental components in the design represent objects with their personal state as well as operations rather than functions. According to this model, objects may be implemented in a sequential order. Each object represents some entity of interest in the system being modeled, and is characterized by its class, its state (data elements), and its behavior. Various models can be created to show the static structure, dynamic behavior, and run-time deployment of these collaborating objects.

According to Ian Sommerville, the advantage of this design approach is it simplifies the evolution of the system by reducing time and cost [3].

UML (Unified model language) is one of mostly used design language for documenting a software project in object-oriented analysis & design. Documentation part is very important to visualize the graphical impression of the software system.

UML is the best designing language can be used with graphical notations rather than text notations. The system identification between the developer and the stake holder ease with UML notations. Following are the models can be used in UML to describe the various steps of the system.

1. Use-Case Diagrams
2. Activity Diagrams
3. Sequence Diagrams
4. Class Diagrams
5. Collaboration Diagrams

3.2.2 Structured system analysis and design methodology (SSADM)

Structured systems analysis and design method (SSADM) is a systems approach to the analysis and design which provides a framework for detailed system modeling as part of requirements elicitation and analysis.

The importance of this method is it can be applied for many large projects delivering cost reductions by using slandered notations and design documentation.

But according to Ian Sommeville, structured methods suffer from number of weaknesses as follows [4].

- Do not support for modeling non functional requirements.
- Do not usually include guidelines to help users decide whether a method is appropriate for the particular problem.
- Produce too much documents.
- Produced more detailed models which difficult to understand.

3.3 System life cycle management

According to the software engineering methods, One model can be applied by the developer to structure the architectural design which can be changeable during the design process not doing more rework. So the predictable design methodologies with most suitable tools can be used [5].

3.3.1 Waterfall model

In this model all the processes of the development can be done in separate process phase. Fundamental process activities of specification, development, validation and evaluation needed to be done in one by one as a chain. The benefit of this model is the process can be developed on individual activities as use cases.

The advantages of this method are as follows; it focuses on objectives from the beginning of the design, can be identified the achievements of requirements that because of design releases unit wise. System testing also can be done in easy way, using unit testing while designing as units.

The disadvantage of this model is it is not flexible to do changes in backwards. So the requirements must be identified correctly in the first stage.

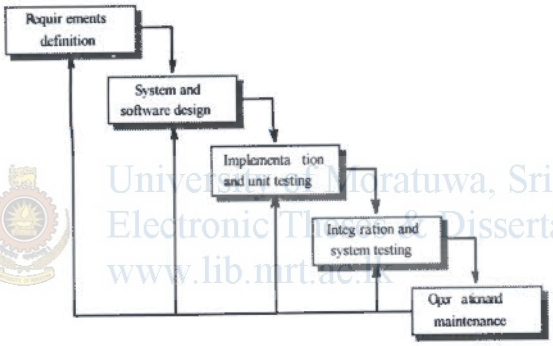

Figure 3.1: waterfall model

3.3.2 Iterative development model

This model is used as a set of activities of specification, development and validation. In this model, system will be developed on specification initially. Then refined with customer inputs & customer needs, some undeveloped activities can be found. This will be a disadvantage due to failure of well planned work flow.

3.3.3 Software prototyping

In this method, a software parts will be implemented by the developer initially to test with the customer idea. This will not be used as the final system that because of software will be changed by contrast. Prototyping can also be used by end users to

describe and prove requirements which not considered by developers. So, it can be a key factor in the commercial relationship between solution provider and the client [6].

Several benefits of prototyping can be identified as follows.

- The software designer and implementer can obtain feedback from the users early in the project.
- The developer and the client can compare the software matches the software specification.
- Developer can have an accuracy of initial project estimates.

3.4 Programming languages

Among the types of languages like functional, logical, text formatting, object-oriented and scripting languages, the object- oriented and scripting languages were adapted as most suitable for web based information system. There were so many object oriented languages and scripting languages which could be used as in similar pattern. As examples Java, Asp, Perl, PHP are object-oriented languages. Java script is a scripting language that can be used. Most of these languages can be implemented with free compilers. So, it is easy to use.

Java Script, PHP and HTML technologies are protected under GNU public licenses as open source software. Other alternative technologies are so expensive, that because of needs to purchase end user licenses to use this software under the enforcement of Intellectual Property Law in Sri Lanka. So, one of these language can be used for the proposed system [7].

3.5 Database environment

MS SQL Sever, Oracle and MySql are the database management software that can be applicable for the proposed system model. Among the DBMS software mentioned above, the only DBMS software available under GNU public license is MySql. It normally comes with most of the UNIX versions. It provides multi-user access to a number of databases at a time.

3.6 Web server

Apache HTTP, Apache tomcat and IIs can be used as web servers. The advantage understood in Apache server than others is it is freely available.

3.7 Development environment

3.7.1 LAMP

LAMP is usually free and open source software which can be run in web servers.

LAMP refers – Linux - operating system

Apache - Web server

MySql - database management system

PHP or another language – programming language

The combination of these technologies is used to define development background.

3.7.2 WAMP

WAMP is usually free and open source software which can be run in web servers.

WAMP refers –Windows - operating system

Apache - Web server

MySql - database management system

PHP or another language – programming language

WAMP is a developed package that can be installed on computers uses windows operating system.

3.8 Summery

In this chapter, technologies that can be applied similarly to IPS-IRD were discussed on topics such as system life cycle management, programming language, database environment, web severs and development environment. However these technologies can be applied by the developer selecting better technologies to develop the system. Selected technologies for IPS-IRD system will be discussed in next chapter.