

Technology adapted to Design and Development

3.1 Introduction

The previous chapter was about the image clearing and involvement of participants in the process. This chapter describes technologies those can be used for the system right from the analysis phase to evaluation. Some of them are necessarily not techniques but are practices. The description of technologies is maintained to align with the needs of system requirements.

Prof. Ian Somerville's book on Software Engineering is clearly indicated that any kind of software development process deals with following set of activities:

- Specification
- Design
- Validation
- Evolution



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Unless the design stage comes, these options will be kept open.

3.2 Software Process Model

As per Prof. Ian Somerville there are basically three generic software models are available [11].

1. The Waterfall model
2. Evolutionary development
3. Component-based software engineering
4. Variant of these models

¹¹ <http://www.comp.lancs.ac.uk/computing/resources/IanS/SE6/Slides/PPT/ch3.ppt#270,5>, Generic software process models

3.2.1 Waterfall model

In the in house development environment it is inevitably iterative work will have to be done. With the past experience it can say overlapping work will be there in the said four activities. Then the Waterfall model might be suit as software process model. The Figure 3.1 shows the behaviour of this model.

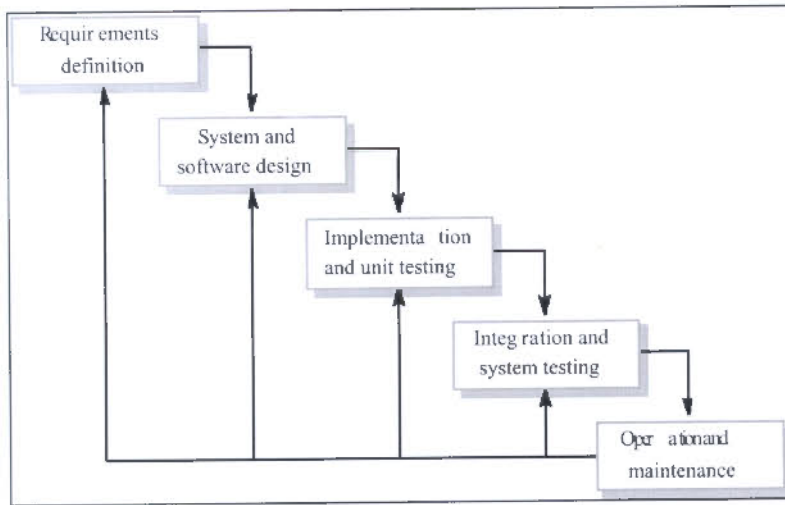


Figure 3.1: Waterfall model [12] *University of Moratuwa, Sri Lanka. Electronic Theses & Dissertations www.lib.mrt.ac.lk*

As per the Figure 3.1 every stage of process, there are overlapping in later part of the previous process with front part of the next process. There is a provision to go back to previous processes from the last process too.

Disadvantages with the Waterfall method:

- Inflexibility to respond to the changing customer requirements; but still suit for middle scale systems that requirements are well understood
- Hardly ever businesses have stable requirements
- This can be used for large systems but in different components in several sites.

3.2.2 Exploratory development

It should start with well understood customer requirements add new features as they come from the customer.

¹² <http://www.comp.lancs.ac.uk/computing/resources/IanS/SE6/Slides/PPT/ch3.ppt#271,6>, Waterfall model

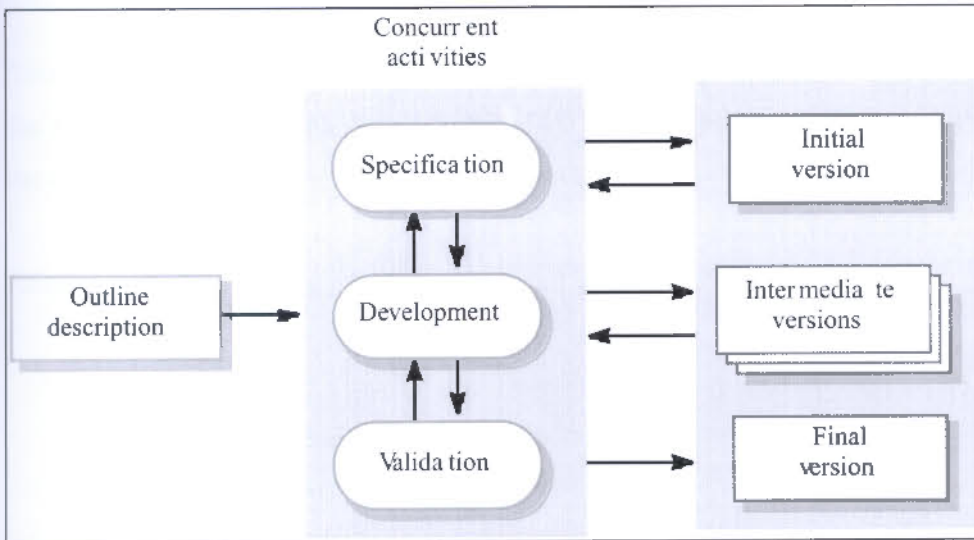


Figure 3.2 : Exploratory development [13]

As per the Figure 3.2 it is shown that using outline description three processes are going concurrently. Three deliverables must be provided at these processed too.

Although following problems involved, still for medium scale project this model can be used.

- Lack of process visibility;
- Systems are often poorly structured;
- Special skills (e.g. languages for rapid prototyping) may be required

3.2.3 Component-based software engineering

In this model it is used already available components integrate or provided components from of the shelf.

With regard to the proposed system there are no components visible.

¹³ <http://www.comp.lancs.ac.uk/computing/resources/IanS/SE6/Slides/PPT/ch3.ppt#273,10>, Evolutionary development

3.3 Software specification

This refers to the process of establishing what services are required and the constraints on the system's operation and development [14]. This process is considered as the core of the system.

Requirements engineering process is consisted with followings:

- Feasibility study
- Requirements elicitation and analysis
- Requirements specification
- Requirements validation

3.3.1 Feasibility study

Under this following feasibilities were considered:

1. Economic Feasibility – Financial viability of the project
2. Technical Feasibility – How available technologies fit to the system
3. Organizational Feasibility – Willingness of the organization with regard to the system
4. Legal Feasibility – Development of concerned system with regard to the aspects in bank and other financial regulars

As far as the organization is concern thorough said studies are required as a financial institute. Refer the Appendix C for details of the feasibility study.

3.3.2 Requirements elicitation and analysis

When it deals with several stakeholders requirement conflicts arises. In order to overcome this it must be concerned with detecting and solving possible conflicts between requirements, defining the system scope and how it should interact with its environment

¹⁴ <http://www.comp.lancs.ac.uk/computing/resources/IanS/SE6/Slides/PPT/ch3.ppt#312,23>, Software specification

and designing the step from system requirements to software requirements. Most importantly the source of requirements is identified and the requirements are captured. As far as the proposed system is concerned there are several departments are involved with clearing process of the bank.

3.3.3 Requirements Specification

This is refers to complete description of behaviour of the system to be developed. Based on these specifications the USE CASES can be developed to get the picture of functional requirements of the system and interaction of users will have with the system [5]. This will be a useful technique to be emerge system functionalities in the proposed system. In addition to that non-functional requirements – constraint to the system are defined.

3.3.4 Requirements validation

“Have you got the right requirements?” that is the question should ask this stage. We can use existing system’s reports and other documents for this purpose. In the proposed system there are files to be exchange with Core Banking System and LCPL. These formats can be validated before hand.

3.4 Software Design

This is the process of problem solving and planning for a solution [4]. In includes high level architectural design to code level design. There are several technologies could be use for software design.

3.4.1 Object-oriented analysis and design (OOAD)

OOAD is a software engineering approach that models a system as a group of interacting objects [3].

⁵ http://en.wikipedia.org/wiki/Software_Requirements_Specification

⁴ http://en.wikipedia.org/wiki/Software_design

³ <http://en.wikipedia.org/wiki/OOAD>

Objects are representing followings:

- Entity in the system being modelled
- Characterized or evolve by its class
- Its state
- And its behavior

OOA is focused on what the propose system is going to do, while OOD focused on how will the system do it. Different notations are available for representing these models. Unified Modeling Language –UML is widely used for this modeling.

OOA - looks at the problem domain, with the aim of producing a conceptual model of the information that exists in the area being analyzed.

OOD- transforms the conceptual model produced in OOA to take account of the constraints imposed by the chosen architecture and any non-functional constraints.

This method of analysis and design visualize the behaviour of the system and satisfy the users. Reusability is always required in the proposed system.



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3.4.2 Structured Systems Analysis and Design Method (SSADM)

SSADM is a waterfall method by which an Information System design can be arrived at; SSADM can be thought to represent a pinnacle of the rigorous document-led approach to system design, and contrasts with more contemporary Rapid Application Development methods [6]. Proposed system is not aligning with this kind of approach as mentioned characteristics are not visualized in the system.

3.5 Validation

This is refers test to whether the software requirements have met the provided solution. The question here should ask is “Have we built the right software?”. The efficiency and

⁶ http://en.wikipedia.org/wiki/Structured_Systems_Analysis_and_Design_Method

functionality are always curtail is validate in the proposed system. This is part of the software testing and followings are main software testing methods.

Black box testing – the software is considered as a black box and test the functionality

White box testing – testing done in the code level knowing the implementation – data structures and algorithms of the software

When the size and the complexity of software and time constraints is concern the test method should be simple. The selecting a test method will be based said issue.

3.6 Evolution

This refers to process of evolving an existing system to meet new requirements [10]. As the system based on banking the business process might be changed.

3.7 Alternative Systems

Here alternative systems are considered with regard to the implementation. The selection of suitable technology is done on a comparison. Four technologies were considered below.



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3.7.1 Stand Alone

The existing system is a stand alone system. It has made vast amount of brow backs. The management has decided to replace the said system. It has no interface with the banking system or signature verification system.

3.7.2 Multi User Environment Using Web Technology

The Multi user environment using web technology can be used for the system using already established VPN which is a closed network. When the necessity arises it is needed to refer the branch manager by a screen. It can be done by this technology. Connecting with the core banking system and among CICPS users using the LAN is still viable. And also there is no security issue using this technology.

¹⁰ <http://www.comp.lanacs.ac.uk/computing/resources/lanS/SE5/syseng/cbse/evolution.ppt#256,1,Systems evolution>

3.7.3 Web Technology

Using web technology it can be connected each node using the internet. But it will be heavily slow with regard to the handling images and the heavy volume of cheques. And the other main disadvantage is lack of security in this technology.

3.7.4 Comparison of Alternative Systems

There is a comparison in Table 3.1 on alternative systems with regard to the implementation.

Facility/Feature	Implementation			
	Standalone	Multi user Web based	Web based	Desk top Application
Availability	High	Medium	Medium	High
Accessibility	Low	High - Limited	High	High - Limited
Connectivity	Low	High - Limited	High	High - Limited
Security	Low	Medium	Low	High

Table 3.1 : Comparison of Alternative Systems

3.7.5 Why It Is Favourable The Desktop Application?

This comparison nothing worth for which one is better than the other. But for understand what differences are helping for the project in selecting the technology.

By considering above fact it can be omitted the considering the stand alone system and the web technology. But it can not be omitted the multi user environment using web technology easily. Main advantages for selecting desktop application are follows.

1. It is relatively fast – When you download content, obviously you get it to the desk top in one fetch - means gets desk-top quality performance.
2. It can be find more user controls.

3. Robust system of keyboard shortcuts– In the web base it can be hardly find short cut key for quick operations and navigations. It is inevitable to deal with high volume with images in this system. The operation has to be completed in short period of time. Then the need of shortcuts is high.
4. Accessing hardware devices easy like printers, CD writer etc.
5. Web applications are hard to access computer resources like file system.
6. There are still some common browser problems to overcome.

3.8 Summary

This chapter describes technologies could be use in software process for proposed system. In some instances comparison between the technologies also included. The chapter is discussed about my approach to adapt to technology to solve the problem.



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