METHODOLOGY

3.1 Introduction

This chapter presents the methodology used to develop the system. Software and hardware requirements are also presented.

3.2 Methodology

The Buy-Back Centre Inventory System is developed based on Software Prototyping. The Gantt chart for this project is shown in Appendix K. Figure 3.1 shows the phases of Prototyping which start from requirement analysis followed by system design, build prototype, user evaluation, refining prototype and engineer product.

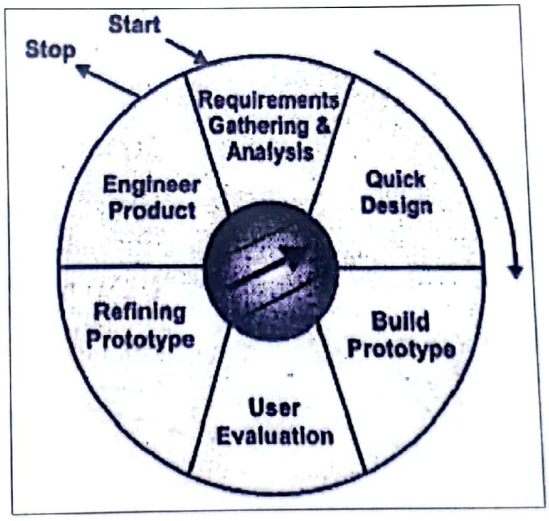

Figure 3.1: Phases of Prototyping.

A prototyping model begins with requirement analysis and the requirements are defined after interviewed the users. When requirements are known, a quick system design is created to help in developing the prototype. First prototype is formed using information from quick design to represent the working model of the

required system. Next, the prototype is presented to user and strengths and weakness such as what to be added or removed are recognized through user evaluation. If users are not satisfied with the current prototype, a new prototype is developed with additional information provided by the users. Once the users are satisfied with the developed prototype, a final system is developed on the basis of the final prototype. Prototyping provides a working model to users in the early process, enabling early assessment and improving communication between developers and users.

Software Prototyping is suitable for this project because the finance staff for the Buy-Back Centre are still deciding on the functional requirements of the system. Thus, the prototype is developed based on the currently known requirements. With feedbacks from the users, developer can capture and produce the system as desired by the users.

3.2.1 Requirement Gathering and Analysis

Prototyping start with the requirement gathering and analysis by interviewing the users. This phase identifies all the data and requirements from the user. An interview with Miss Chow Wai Chun (finance staff) was conducted on 1st August 2014. At the beginning of interview, user described the background of Buy-Back Centre and the main business of Buy-Back Centre. After that, user described the process of buying and selling carries on in the centre and documents involved in the processes. Some of the main document was collected for references. If any new requirement is added or changed, Miss Chow Wai Chun (finance staff) or Mr. Tan Sun Min (MIS Executive) email or call to notify. The interview outline (See Appendix A) was used to make sure the interview can be conducted smoothly.

After the meeting with user, the data were analyzed and review on some similar systems was done. The trial version of the existing systems were installed. From reading the manual of the systems and tried to use the system, further understanding was achieved about the business, the software and how the software present the data.

3.2.2 Quick Design

A quick design is created to help in developing the prototype. The information and analysis outcome from requirement gathering and analysis help to design the structure of the system. All important data collected need to be included.

Firstly, the functionality of the prototype is designed and documented using context diagram and data flow diagram. Data flow diagram is used to model the functions in all the modules of the system, the interaction between those functions together and the data exchanges between processes and database.

After that, a database structure is designed by drawing entity relationship diagram and data dictionary. Entities, attributes and relationship for the system are identified by using the information collected. Then, entity relationship diagram is drawn to show the relation between entities and attributes. Data dictionary that contain the details information of every entities and attributes identified such as name, description, data type, size and key is included.

The following design is the interface design which defines the general appearance of all screens in the system. It specifies the basic layout of the screens and defines a standard placement and order for common interface actions. User interface is the interaction between user and computer system. Hence, the interface of the system is designed based on the modules to support user requirements. The interface also is designed according to the design principle that emphasize the simplicity, structure and consistency.

3.2.3 Build Prototype

The initial prototype is developed using data from the quick design. Types of software prototyping used to develop Buy-Back Centre Inventory System is evolutionary prototyping. Therefore, the prototype is an actual functional prototype with minimal functionality. Testing is carried out to ensure the functionality of prototypes work well and accurately. Three types of testing is conducted: unit testing, integration testing and system testing.

3.2.4 User Evaluation

After Buy-Back Centre Inventory System Prototype is done, the system is presented to user for evaluation. The system is demonstrated to Mr. Tan Sun Min, Executive of MIS (Management Information System) Department and Miss Chow Wai Chun (finance staff) to evaluate and review. Mr. Tan and Ms. Chow may give new requirements, suggestions and comments on the prototype. Discussions on interface and functionality are included. After the evaluation and discussion, further functionalities may be added or removed.

3.2.5 Refining Prototype

Current prototype is refined according to information given by user after evaluation. If small changes involved in refinement phase, a final system is developed on the basis of the final prototype. If the changes involved the design of the system, the next phase need to go back to the design phase and a new prototype is developed with additional information provided by the users.

3.3 Software Requirements

Buy-Back Centre Inventory System is developed using Visual Basic programming language with Microsoft Visual Basic 2010 Ultimate as the Integrated Development Environment (IDE). Microsoft SQL Server is the database and SAP Crystal Report is embedded to Microsoft Visual Basic 2010 Ultimate as the reporting tools to format and generate the reports.

Table 3.1: Software Specifications for System Development.

Software	**Usage**
Visual Basic	**Programming Language**
Microsoft Visual Basic 2010 Ultimate	Integrated Development Environment
Window 7 (Home/Professional)	Operating System
Microsoft SQL Server 2008	Database
SAP Crystal Report	Reporting Software Tool

3.4 Hardware Requirements

The system had been developed using software listed in Table 3.1, the hardware as stated in Table 3.2 are used.

Table 3.2: Hardware Specifications for System Development.

Hardware	Specification
Computer	-1.6 GHz or faster processor -1 GB RAM (1.5 GB on a virtual machine) -3 GB of available hard-disk space -5400 RPM hard-disk drive -DirectX 9-capable video card running at 1024 x 768 display resolution
Input control	Mouse Keyboard
Output control	Monitor
Backup	Pen Drive

3.5 Conclusion

The methodology chosen for the development of Buy-Back Centre Inventory System is Software Prototyping. The motivation of choosing this methodology is because of undecided functional requirements from the users. With this methodology, refinement of prototype until the final requirements have been decided is allowed and the users are able to give feedbacks towards the developed prototypes. The Windows-based Buy-Back Inventory System is developed using Visual Basic programming language, Microsoft SQL Server as the database, and SAP Cryptal Report to produce required reports.