CHAPTER 3

METHODOLOGY

In Chapter 2, we have been discussed in details about the several existing pairwise testing strategies. Therefore, in this chapter we will discuss about the methodology that we will use to finish up this research. Rapid Application Development (RAD) whereas one of the existing methodology will be used as a guideline to build the Pairwise Test Data Generation Tool based on the Simulated Annealing algorithm (PSAT). There are several stage consists in RAD and the importance for each stages will be explained in details in this chapter.

3.1 Introduction

The proposed PSAT is designed by implementing the SA algorithm. As we discuss in the previous chapter, the goals of designing these generator tools is to minimize the number of test cases for an input system. Therefore, SA algorithm is implementing in the PSAT because SA is a random search algorithm that able generated the least number of test cases for this research.

To complete this research as we planned, a methodology is needed to include into development of PSAT. The methodology is a standard framework used to plan and manage the activities inside the process development of PSAT. There is important for every project to have a methodology as a guideline to ensure the goals of the research is achieved.
There are a lot of different kind methodologies in the software development process. The most common methodologies consist of Waterfall Methodology, V-Model Methodology, Spiral Methodology, Agile Methodology, Rapid Application Development (RAD), and Extreme Programing (XP). In this research, RAD has been chosen as the methodology to develop our Pairwise Test Data Generation Tool based on Simulated Annealing Algorithm (PSAT).

### 3.2 Methodology

RAD is to improve the process of development which faster than the Waterfall Methodology (Martin, J. 1991). By using RAD, our research is able to produce high quality generator tools and have the potential to reduce time to complete this research. We adopt the RAD methodology and have carried out four stages which are requirement planning stage, user design stage, implementation stage and evaluation and documentation stage. Figure 8 shows the stages of the RAD model.
3.2.1 Requirement Planning

In this stage, we have analyzed and determine the existing problem that related to this research. There is an important step before we start to decide the goals and objectives of the research. The goals of this research are to develop a PSAT by adopting SA algorithm. NetBeans IDE 8.0.2 with JFrame and JDK 8.0 has been chosen as the development tool to develop these PSAT.