

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This project will be finished with some steps such as :

#### **3.1 Analysis**

Do a analysis to know what is needed. Such as data that will be processed (name of activity, time required, and predecessor. By using Critical Path Method (CPM) algorithm and will be showd on Android by using Android Studio. After getting the data to be processed, from the data will continue to find the critical path from a project that finished in several steps that is iteration. Iteration is a step to find connection between activity and predecessor. The result from iteration will be used in the next step that is forward pass. Every activities have duration. Forward pass is done by getting from activities that interconnected, that is the earliest activity start time plus the duration of the activity. If one activity skipped more than once then that activity has the biggest value. The next step is backward pass which is the opposite of forward pass, backward pass is done by counting from finish to start. The value from backward pass of an activity is value from predecessor activity minus the duration from that activity. And the last steps to find the critical path is if the difference between value from forward pass and value from backward pass is equal to zero, then the activity inserted to the project management critical path.

#### **3.2 Create Design Program**

In this step, which is done is to make the program design. such as display interface and find the data structure from the data in the first step. The first input is total activities, then will appear activities' code and column to fill the activities' name, duration, and predecessor. Then fill the column according to the data and process the data according to the steps to find the critical path using CPM. After

the critical path is found, the it will be displayed in network diagram and gantt chart on Android OS.

### **3.3 Implementation**

In this step, write the program code using Critical Path Method algorithm in Java programming language and using array data structure in Android Studio.

### **3.4 Testing Program**

Program Testing is done with the purpose to know if there is an error in the program, and to know if the program result in accordance with the result should be. The test that performed is execute the program with the available data. Input the data until reach the program output.

