

CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter contains two main parts which are the methodology of the whole project and methodology of the experiment set up for the project. In the first part, it explain the outline of this project flow from start to end while in the second part it explain on the procedures for the experiment being set and run.

3.1 Project Methodology

This project begins with title selection from a list of final year project proposed by faculty's lecturer. Once the title was confirmed, the details of the project (objectives and scope) being discussed and clarified through the discussion with supervisor. Then this project carried on with massive academic study and review that related to the project's title through reliable source such as journals, conference papers, thesis, published book and industry manual.

After summarized all the academic review, a proper experiment planning can be develop, which the methodology of experiment design and development being discussed in next section. All the data obtained from experiment being recorded and analyzed through graphical method. Further analysis of the data being done by comparing the result with the previous work done by other researchers and data interpretation is complete with the engineering concept and theory.

The final stage, it is the stage of final presentation on the whole project being carried for a year to the supervisor and invited panels. The final report is submitted for evaluation on this project and minor correction being done being making it into hardbound thesis. All stags summarized in the process flow diagram below:

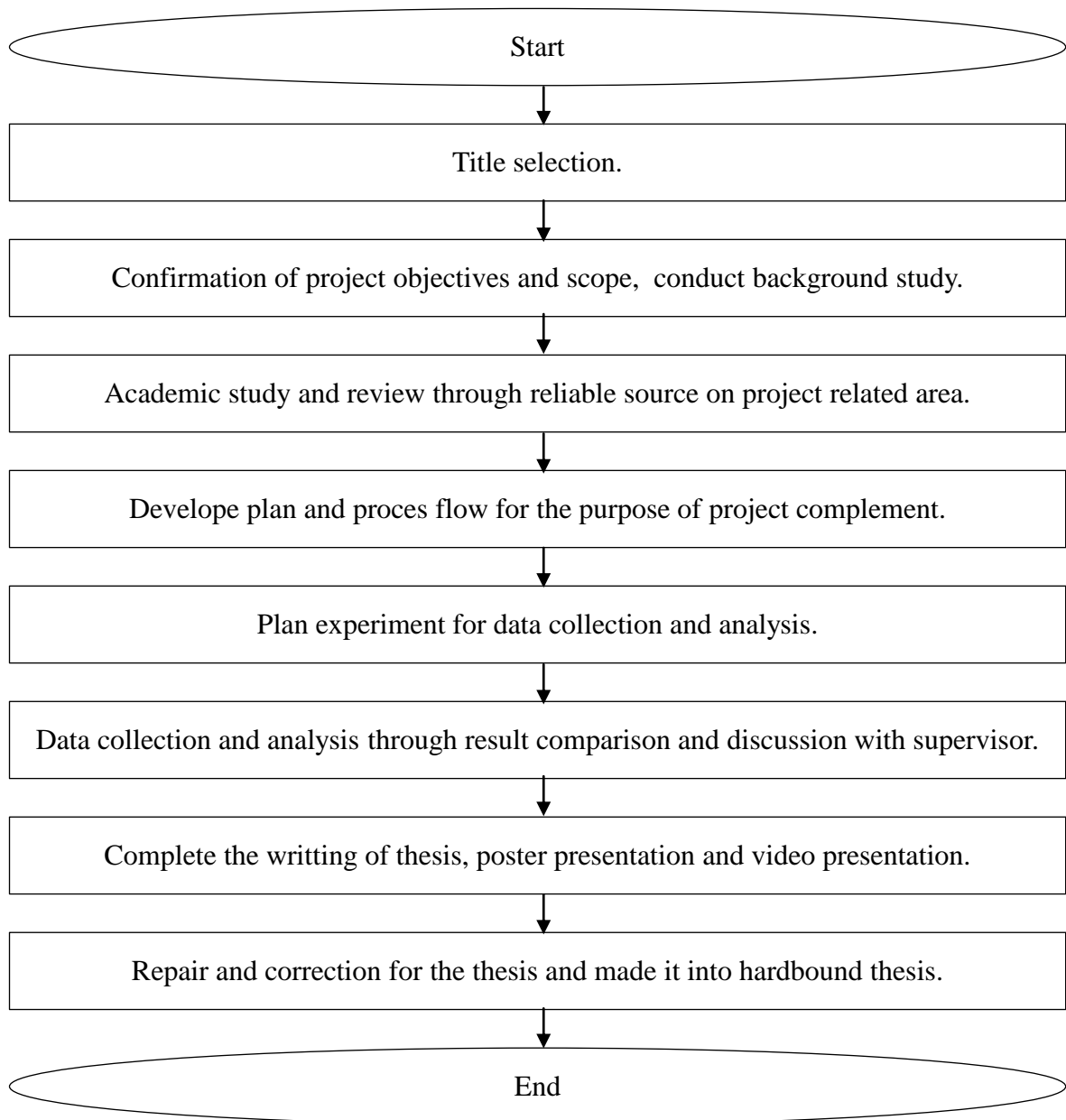


Figure 3.1: Project Methodology.

3.2 Experiment Methodology

The first stage planning of an experiment is the clarification of the inputs for the experiment which are the material, process, cutting tools and equipment needed. Based on the academic study, cost consideration and the availability of require material, all the inputs of experiment being selected as below:

- | | | |
|---------------------|---|---|
| 1. Process | : | Turning operation |
| 2. Machine | : | Conventional lathe machine |
| 3. Material | : | Mild steel ASTM A3 |
| 4. Cutting tool | : | Taegutec tnmg 160408 tmt 9125 coated carbide |
| 5. Tool holder | : | Mitsubishi mtjnr tool holder. |
| 6. Equipment needed | | Prova 6830 Power and Harmonic Analyzer
Surface profilometer (Perthormeter)
Optical video measuring system
Infrared Thermometer |

The chemical composition of mild steel ASTM A3 as below:

- | | | |
|--------------------|---|------------|
| 1. Carbon | = | 1.2-1.3% |
| 2. Silicon (Si) | = | 0.1-05 % |
| 3. Manganese (Mn) | = | 0.4-0.6 % |
| 4. Phosphorus (P) | = | 0.03% |
| 5. Sulphur | = | 0.03% |
| 6. Chromium | = | 4.75-5.50% |
| 7. Vanadium (V) | = | 0.8-14% |
| 8. Molybdenum (Mo) | = | 0.9-1.4% |

The physical and mechanical properties of the ASTM A3 mild steel showed in the Table 3.1.