

CHAPTER 1

INTRODUCTION

1.1. Background

In Indonesia, there are many companies that offered making souvenirs. As a player in Yogyakarta, Universitas Atma Jaya Yogyakarta is participate by utilizing Roland Modela MDX40 as prototype machine facilitate the Universitas Atma Jaya Yogyakarta to provide high quality of detail and intricate design for mastering souvenir. The partnership with Delcam since 2006 has opened a big opportunity to develop the ArtCAM technology which offers capability in creating involutes details of relief leads to the differential advantage of souvenirs.

Therefore, the application of spin casting technology is required. Spin casting has an objective to a mass production in every processing nut in relatively cheap cost. It requires many patterns inside the mold that will be fulfilled by metal liquid. Amount of pattern depends from how many products that will be produce.

The mold pattern would depend on the master model that vulcanized before spun. If there is a good master model, there will be a good pattern on the mold. This will produce a good product result. To produce souvenirs using spin casting techniques needs the high-quality design and accuracy in mold making. However, duplicating master model by using Roland Modela MDX40

is not recommended because: (1) Producing a master model using a Roland MDX 40 machine consumes a long time (depend on product complexity) due to metal material used for producing the master model is a heat resistant material, hence requires more time to shape; (2) Roland MDX 40 machine are high costly to use. The time consumption in the process of making the master model would burden the cost of electricity and replacing the cutter all the time when it is not sharp anymore; (3) A Roland MDX 40 machine also requires a machine operator to always stand by to frequently giving the machine and cutter oil lubricant during the process (Pamungkas, 2009).

In line with the improvement, in year 2009, research titled "*Techniques in Making Master Model for spin casting Technology*" wrote by Dahana Pamungkas found the spin casting techniques by utilize high temperature vulcanization (HTV) silicone rubber as a mold and build a master model machine. The master model machine was made by several considerations such as pressure when the liquid metal poured, spread the liquid metal into whole pattern inside the mold, and throw the air away inside the mold. Consequently, there are many limitations found such as the master product limits in the dimension 40 mm diameter and 4mm-5mm thickness (UAJY Keychain), high machine vibration, poor design in mold frame construction, the prop issue in the spin process. The prop usage from the previous research viewed as imperfect because, there are require more setup time to conduct the spin casting process. The prop usage in the previous research is caused by

un-flatness of the rubber mold and mold frame. From these limitations, important to evaluate and continue the next research in redesign the master model machine.

In the next experiment, a new product Adaro Business Card Holder which has dimension 110mm x 60mm and 3,8mm thickness given to accommodate the need of larger mold frame dimension. Therefore, this thesis will present the redesign and construction mold frame that reliable in purpose to obtain larger dimension of mold frame and eliminate the prop usage in spin casting process.

1.2. Problem Statement

Based on the background, the main problem in this research is how to obtain appropriate design of mold frame for master model production in spin casting technology which are visually the same as master model and have no defects.

1.3. Research Objectives

The objectives of the research are:

1. Obtain larger mold frame and construction of master model machine by evaluating the present one.
2. Obtain the experimental result of Adaro Business Card Holder product due to eliminate the prop usage in master model machine by evaluating the present one.
3. Obtain the production cost per unit of Adaro Business Card Holder.

1.4. Scope of Research

To avoid the problem do not get abstract, as a result the scope of research are:

1. Prioritizing the need of larger mold frame and plate adjusting to the existing machine frame, the construction of the master model machine will be focused develop the maximum mold frame and components functionality and proper mechanism in order to eliminate the prop issue, therefore anthropometric data is ignored.
2. Considering the complexity relief and single-sided shape, the Adaro Business Card Holder product will be used as an experimental object in spin casting process.
3. The research use only one type of HTV silicon rubber, referred to the previous research.
4. The research use only one type of tin material, referred to the previous research.

1.5. Research Methodology

The research methodology will follow the sequence of flowchart shown on Figure 1.1.

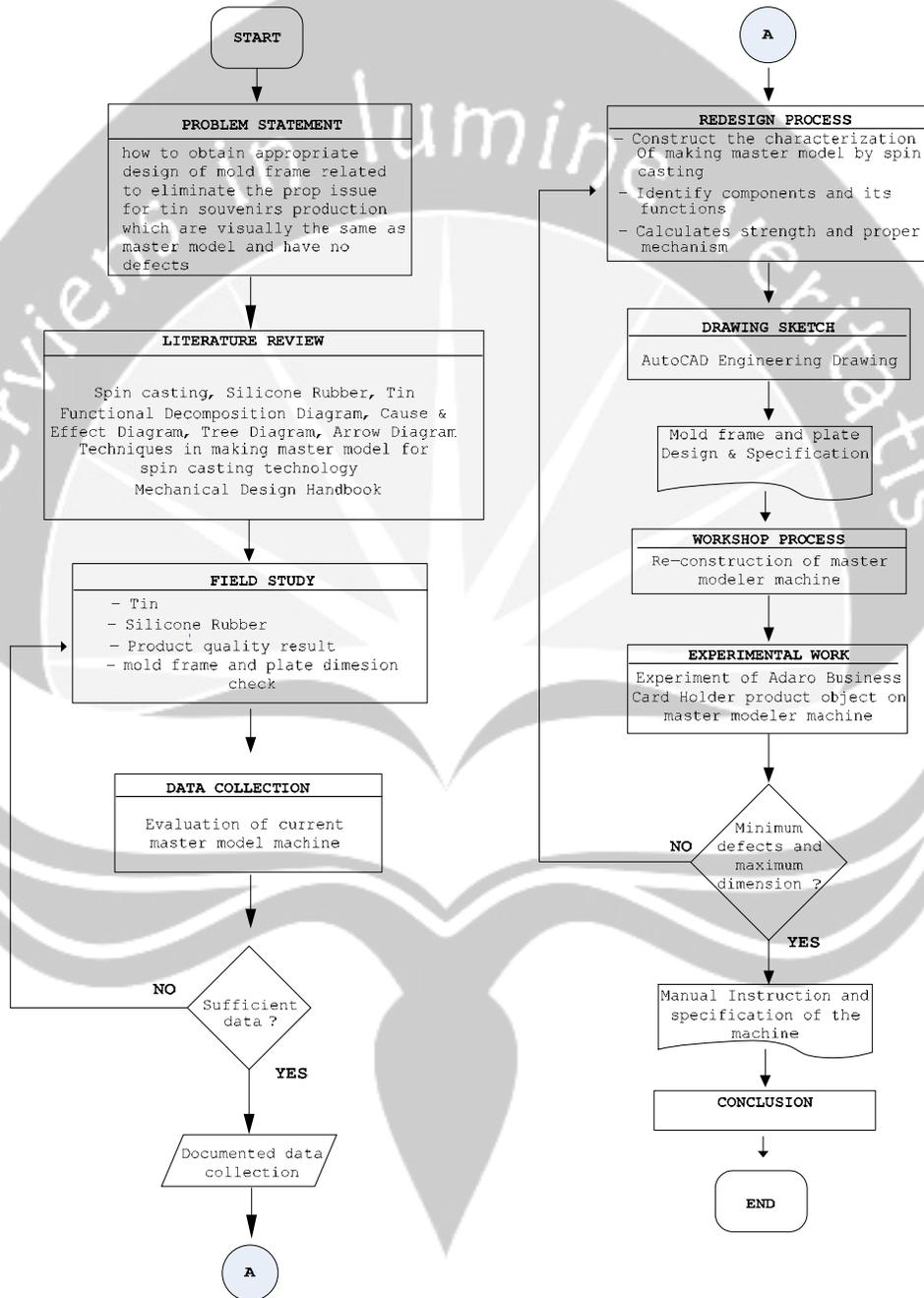


Figure 1.1. Flowchart of Research Methodology

1.6. Report Outline

The writing systematic in thesis report is arranged below:

Chapter I : Introduction

This chapter consist of background, Problem statement, Objectives, scope of research and research methodology.

Chapter II: Literature Review

This Chapter consist of short review of later researches about the master model machine and later analysis about this problem.

Chapter III: Basic Theory

This chapter consists of literature theories contributed to problem solving.

Chapter IV: Data and Analysis

This chapter consist of observed data and collected data.

Chapter V: Discussion

This chapter consists of data analysis and discussion based on application case.

Chapter VI: Manual Instruction

Consist of Specification and the operational procedures of the master model machine.

Chapter VII: Conclusion

Consist of short reviewing of the result of the research, and the result of the performance test.