

CHAPTER 3

RESEARCH METHODOLOGY

In order to achieve the objective, here to the research starts to arrange flow of activity and method that will be used in doing the final project. The figure 3.1. below shows the flow of activity in doing the final project,

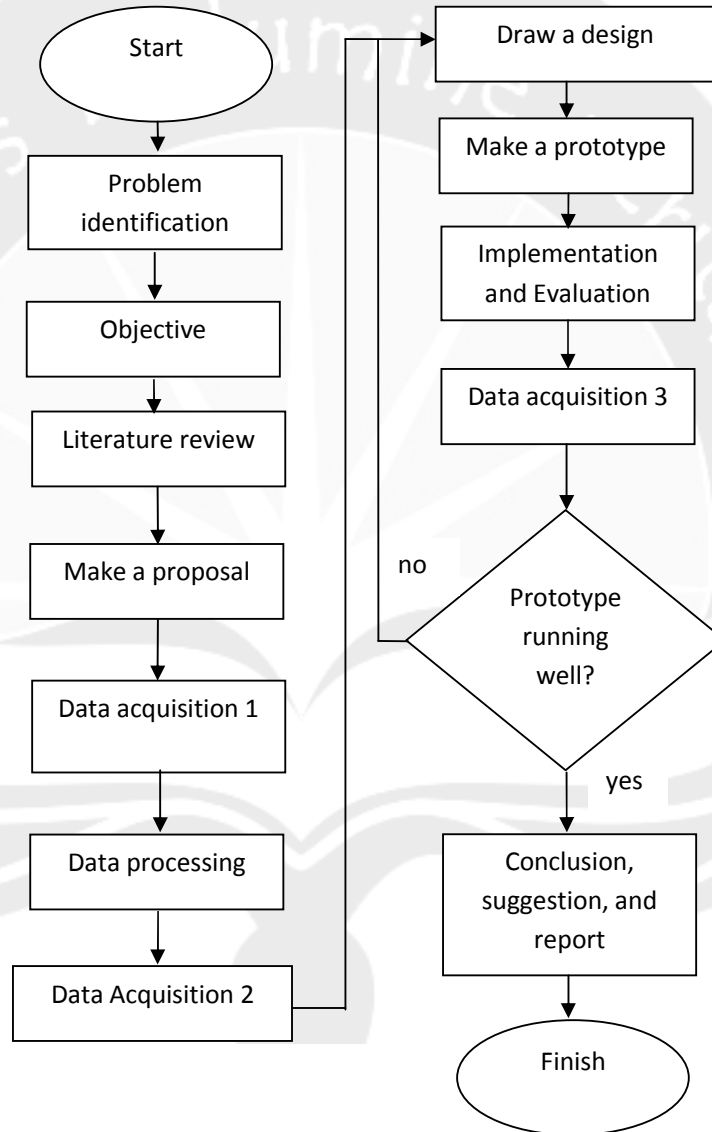


Figure 3.1. Flow of Research Methodology

Based on Figure 3.1., here are the explanations of flow of research methodology.

3.1. Problem Identification

The first activity of this research is identifying company's problem. On July 1st 2013, internship has been done at PT Kusumaputra Santosa located at Karanganyar City for one month in order to identifying company's problem. The observation was done at the production floor for around one month. The activities includes observing production process at production floor, see the detail of each process, and discussion with the operator to get more information about production process. Next is observing the production room, and find the production data, there is a problem which is real production does not meet the production target on the July 30th. Based on one month observation, there is bottleneck at the finishing work center. This problem may cause late of production. The bottleneck is caused by long production process at finishing work center. Then the cause of long production caused by there is so many yarns that does not meet standard that caused by too many dusts in the air at spinning work center.

3.2. Objective

On September 2nd 2013, the problem appear at PT. Kusumaputra Santosa is become the final project. Then based on problem that already found, the objective for the final project was determined, that is to solve the bottleneck problem caused by long production process at the finishing work center in order to help PT Kusumaputra Santosa to get the timely production, how to improve the dust cleaner machine by adding appropriate number of holes at exhaust system to maximize the ability of absorbing the dust in the air around spinning work center.

3.3. Literature Review

Literatures are from books, journals, and internet to find the objective of each literature, after that compare each literature from others literature, and make summary based on those literatures as the tool to solve the problem, so the literature become the reference to find the better way.

3.4. Make a Proposal

On January 1st week 2014, there is proposal preparation. There are two proposals. The first proposal is to ask a permission to PT Kusumaputra Santosa to observe the company. After the proposal finished directly send to the PT Kusumaputra Santosa. The second proposal is to ask a permission to Balai Pengobatan Hiperkes dan Keselamatan Kerja (BPHKK) to borrow the tool to measure the dust level in the air at PT Kusumaputra Santosa. After the proposal finished directly send to BPHKK.

3.5. Data Acquisition 1

On February 1st week, there is collection data about the levels of dust in the air at spinning work center at PT Kusumaputra Santosa. There are several tools needed to collect this data includes, exhaust pump, hose, filter, fan, stander, stopwatch, and hygrometer. These tools are provided by BPHKK. The data collection is helped by Mr. Har from BPHKK for one day, and takes four samples. The data collection is in the day before Friday Prayer and after Friday Prayer. There is also collection data about production for July 30th 2013 at production room. Then collection data about the number of cut and join done by winding machine at finishing work center 30 times. Last is collection data about dust cleaner machine includes, machine capabilities, machine dimension, and machine specification in order to make design improvement for this dust cleaner machine. The data collection needs around two days.

3.6. Data Processing

On February 1st week, after get those data, the next activity is processing the data. The activity includes calculating the levels of dust in the air using the formula that already explained by Hengkifiedianto (2012), also call as gravimetric method. After get the result, and then bring the result to quality control department in order to supports the data about the surface of yarn not align caused by dust enter to the yarn.

3.7. Data Acquisition 2

On February 2nd week, the activity is done at PT Kusumaputra Santosa again to find the data about the new design of dust cleaner machine. The new model of dust cleaner machine is determined by Mr. Muas as the Manager of Spinning

Department. Mr. Muas give the several criteria about the model of new design of dust cleaner machine in order to make this machine can absorb dust optimally.

3.8. Draw a Design and Assistance

On February 3rd, the activity is making a design improvement based on Mr. Muas's criteria. First activity is drawing the design using PowerSHAPE 2011 software. To complete the drawing process of new model of dust cleaner machine takes around three weeks under Mr. Teguh supervision. Then drawing the new design about exhaust system in dust cleaner machine with adds some hole to exhaust system to increase the capability of absorbing the dust.

3.9. Make a Prototype

On March 2nd week, the activity is to make a prototype of new design of exhaust system in 3D model. In the process of making prototype is helped by Mechanical Engineer named Mr. Kiki to support and lead to make a good prototype. The prototype need around two months to finished, include preparing tools and materials that needed.

3.10. Implementation and Evaluation

On May 2nd week, after the prototype finished, next activity is run the prototype for one week at the company, so change the existing exhaust system with the new one, after that run the cleaner machine and make evaluation.

3.11. Data Acquisition 3

On May 3rd week, the activity is collecting the data about dust level in the air again, production data, and number of cut and join done by winding machine. If prototype running well, it means the dust cleaner machine with new exhaust system can absorb the dust optimally and the dust level in the air can be reduced, then number cut and join will be reduced, and the total production will be increased, if not, the activity will back to process make a design with PowerSHAPE software again to fix the new model of exhaust system. After that make a prototype and test at PT Kusumaputra again, until the new model can achieve the objective of this research.

3.12. Make a Conclusion and Report

The final step is make conclusion and report about the result of the project. The report will be start at May 4th week until finish the report under Mr. Teguh supervision.

