

CHAPTER 3 – RESEARCH METHODS

3.1 Scope Of Study

This thesis analysis uses an evaluation research method that prioritizes financial research and calculates in detail the data that we will collect from operations both related to unit population data, program maintenance, revenue, repair costs, operating expense, capital expense. This project was carried out at the Sangata site involving cross-divisional head offices from the Service, Parts, Finance & Accounting div, CGS Project Team, Human Capital, CST.

3.2 Time Frame Study

This study will last for 4 (four) months from September to December 2023. This short time will be used optimally to carry out all study processes from the beginning to the end.



Figure 3. 1 Time Frame of This Research

3.3 Research Framework

According to (Monika Smętkowska, 2018) This research uses the DMAIC model which is a very structured framework and as part of continuous improvement in order

to produce an optimal and best performance. This framework starts from identifying problems and opportunities for improvement that we will work on based on all data and information from stakeholders and their expectations, the next stage is identifying variables to be measured and targets to be set in key performance indicators. The next stage is to conduct analysis by using financial research that will calculate in detail from all the data prepared. Followed by the improvement process that will be carried out in the form of building support infrastructure both offices and warehouses. The final stage reviews all parameters that have been set in the key performance indicator and evaluates the improvements that have been carried out. Six Sigma DMAIC is the implementation of scientific methods that can be used to deliver our best value to customers.

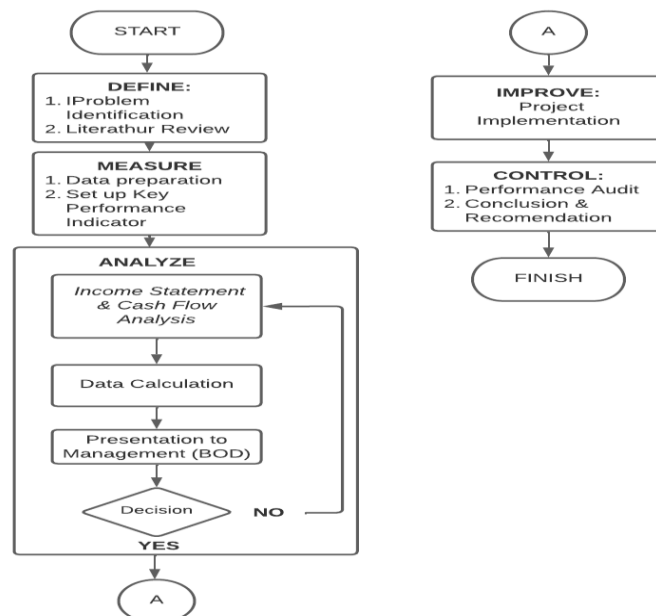


Figure 3. 2 Research methodology

This research is not limited to calculating feasibility studies but includes project implementation and evaluation of the results by using qualitative analysis.

In the analysis stage, NPV (Net Present Value), Pay Back Period, Profitability Index, IRR (Internal Rate of return) and sensitivity analysis will be calculated. The evaluation stage will use the qualitative analysis method where in this stage it will compare the assumption data used to determine the project compared with the results after project implementation which include actual revenue, cost, gross profits, net income, and other parameters such as part availability, mechanic availability.

3.4 Data Source and Collection

The data used are primary data obtained from direct sources and data that have been published in previous research. Unit population data, spare parts sales data and service services, other supporting data are obtained directly from the Sangata site and several other sources both personally and group discussions. Secondary data can be obtained through literature studies both from books, journals, data owned by customers and data from internal and other articles related to this research. Cooperation with other divisions and departments at the head office to compile all data and information needed through meetings and discussions.

3.5 Define – Problem Identification and Literature Review

As a first step in conducting this research is to identify existing problems. Identification of this problem is important to do before research so that the research process can run well and focus more on the main problem. United Tractors is securing a substantial additional project in the PT XYZ Sangata concession. For this prospect, there are major obstacles related to after-sales services to support PT PK's operations. At this stage there is some literature that will be needed to support the research to be carried out. The literature is very useful in supporting the development process of this

research. Some of the literature that will be used is related to feasibility studies that will focus on financial aspects focused on IRR (*Internal Rate of Return*) as a reference in determining whether this investment will be able to run or not.

3.6 Measure – Data Preparation and set up Key Performance Indicators.

The most important part of this study is the data, both primary data and secondary data. These data can be obtained from the site as well as some literature and previous research. All these data must be prepared properly before this research is carried out. Performance indicator is a measure of the success of the project to be carried out. In this case, it is in accordance with the purpose of the study that the success indicator of this research is the realization of after-sales service facilities to support PT PK's operations at site Sangata. In addition, product support business will growth at the Company site Sangata.

3.7 Analyze

In the Analysis stage, it will focus on the analysis of the financial aspect where in this study the performance indicators such as Internal Rate of Return (IRR), Net Present Value (NPV), Pay Book Period will be used as a guideline whether this project is feasible to run or not. To support the analysis, important data are needed which include revenue, capital expenditure, operating expense and several macro assumptions that will be used as the main data for the research process or feasibility study. At this stage, all studies must also obtain approval from the company's management either General Manager and Board of Directors. Non-financial aspects will be used as additional information to support this research process.

3.8 Improve – Project Implementation

After the analysis process is complete, the next stage is project implementation. In the implementation of the project, it will be guided by all plans contained in the

documents prepared before our research runs. This reference is important to note so that the implementation of the project is in accordance with what has been planned and in accordance with previous research so the results to be obtained are appropriate and can even be more than planned.

In this phase, the improvement process can also be carried out when the project implementation is carried out so that what has been planned at the beginning can really be realized properly.

3.9 Control – Performance Audit

This stage is no less important than the previous stages where the performance audit process is an important role in ensuring that the project was realized and successful on target. Assurance of the sustainability of projects that have a positive impact on the company's business growth is really an important key for the company's progress in the future. Consistency in reviewing and controlling all aspects is very important for us to do so that the company's work is achieved optimally. At this stage will also review the parameters of the feasibility study that compiled at the beginning achieved according to plan and proven that these parameters can be achieved when this project is implemented.

3.10 Discounted Cash Flow Techniques

In order to make a decision whether the investment to be carried out is profitable or not, this research uses discounted cash flow techniques which includes:

1. Net Present Value (NPV), is to calculate the present value of the expected future cash flows of an investment minus the initial cost of that investment. If the NPV is positive, it indicates that the investment invested produces cash inflow greater than cash outflow.
2. Profitability Index (PI), is the ratio of the present value of the investment invested to the initial cost invested. If the profitability index value is more than 1, the investment to be carried out is profitable or NPV positive.

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3. Internal Rate of Return (IRR), is the discount rate that makes the net present value (NPV) of a project equal to zero. If the IRR exceeds the Company's expected (18%) or exceeds the cost of capital, the investment is considered acceptable.