

CHAPTER 3 – RESEARCH METHODS

3.1 Research Scope

The research was conducted in the Martabe site, the leading sales area within the PT XYZ Medan branch. The Martabe has one of the most significant spare parts sales in the Medan branch, at around 44% of total sales. The research will examine the relationship between service quality and customer satisfaction and the relationship between increasing OTIF performance and customer satisfaction. It is known that reliable delivery and timely completion could improve PT XYZ's customer satisfaction and loyalty. In the PT XYZ, achieving high OTIF through new support points is expected to speed up spare parts delivery or optimizing the distribution network. It can reduce customer downtime and costs and increase satisfaction and sales. Thus, by establishing strategically located support points closer to customers, PT XYZ could minimize delivery waiting times, optimize inventory levels, and potentially increase cost efficiency, contributing to higher profitability and potentially positively impacting spare parts sales.

3.2 Research Framework

This research uses a robust analytical framework to examine the complex relationship between OTIF, spare parts sales, and the impact of new support points. The study will use quantitative and qualitative research. Thus, it is expected to provide a comprehensive picture of the impact of new support points on OTIF performance and spare parts sales. The triangulation of data from various sources ensures the robustness of the findings, which helps draw in-depth conclusions and present meaningful recommendations for PT XYZ. This research framework uses the DMAIC method, as shown in Figure 3.1.

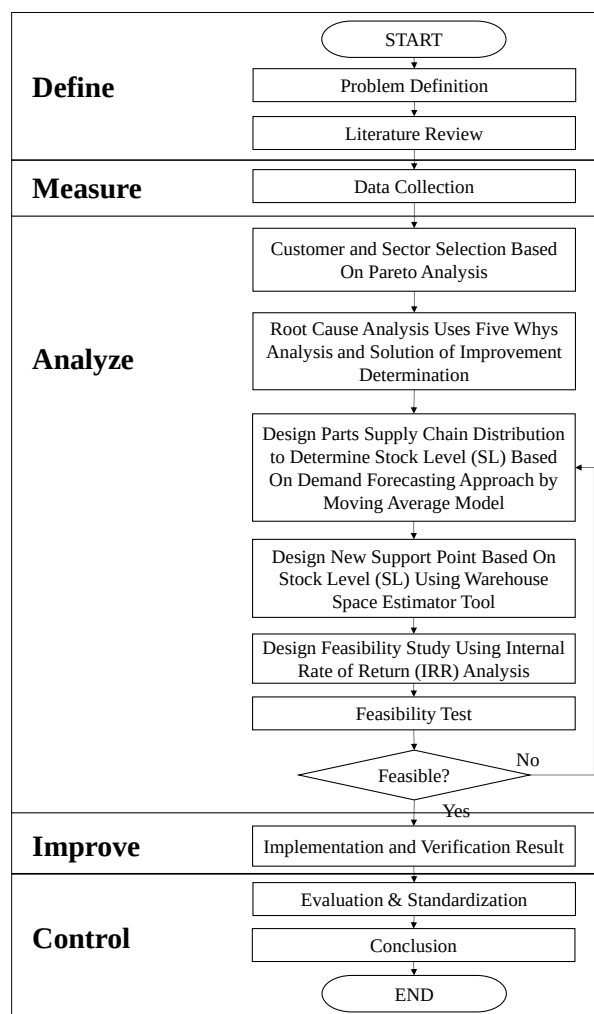


Figure 3.1 Research Workflow

(source: Author, 2023)

3.2.1 Define

The first process in this research is about problem definition and literature review.

3.2.1.1. Problem Definition

This stage is about identifying problems to state the purpose of this research. This stage will determine the main subject of this research. This research will focus on defining the problem of achievement sales, service level measured by OTIF rates, and availability parts at PT XYZ.

3.2.1.2. Literature Review

This stage explores the references to this research problem that have been identified. This literature is the foundation of this research. The literature of this research is forecasting demand, inventory control, warehouse design and assessment of investment feasibility.

3.2.2 Measure

The second process in this research is data collection. The research will use quantitative and qualitative research to investigate strategies to improve the customer service level measured by OTIF (On Time In Full) and to know the relationship between customer service level and sales.

Therefore, applicable and comprehensive data collection is essential for this research and is its foundation. It consists of, but is not limited to:

1. Historical sales data: Demand forecasting and inventory level optimization depend on understanding historical parts sales patterns and volumes.
2. Data on availability parts performance: Availability is the ability to supply towards demand, and the accuracy of demand forecasting will guarantee the ability to supply towards demand.
3. Data on delivery performance: Observing areas for improvement in current distribution strategies requires monitoring OTIF (delivery accuracy and completeness) metrics.
4. Information about customer feedback: PT XYZ Medan Branch customers will be surveyed and interviewed to gain insights into their expectations and problems with spare parts supply.

3.2.3 Analyze

The third process in this research is about problem analysis and generating improvement solutions. In this stage, the problem will be analyzed using five whys analysis to identify the root cause of bad performance on sales and OTIF rates at PT XYZ Medan Branch and generate the solutions for this problem. It will employ an in-depth assessment of

the literature on operation and supply chain management to analyze how to successfully design new parts supply chain distribution to boost customer service level as assessed by OTIF, increase component availability, and decrease lead time delivery. A literature review of finance engineering is also conducted to analyze the decision to invest in a new support point office and warehouse.

3.2.4 Improve

The fourth process in this research is improving sales and customer service. This stage is implementation to build new support points and review results for sales, OTIF, and availability achievements after the new support point is built.

3.2.5 Control

The fifth process in this research is evaluating and state standardization to control the performance through monthly reports for OTIF rates and availability parts performance.

3.3 Research Timeframe

This research was conducted for 16 weeks, as shown in Figure 3.2.

No	Improvement Framework	Activity (Research Framework)	WORK SEQUENCES (WEEKS)															
			Sep-23				Oct-23				Nov-23				Dec-23			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Define	Problem Definition																
2		Research Objective																
3		Literature Review																
4	Measure	Data Collection																
5	Analyze	Root Cause Analysis and Solution of Improvement Determination																
6		Design Parts Supply Chain Distribution																
7		Design New Support Point																
8		Design Feasibility Study																
9		Feasibility Test																
10	Improve	Implementation																
11		Verification Result																
12	Control	Evaluation & Standardization																
13		Conclusion																

Figure 3.2 Research Timeframe

(source: Author, 2023)