CHAPTER VI
CONCLUSIONS AND SUGGESTIONS

This chapter presents the conclusion and suggestions as the final part of the research. The conclusion is drawn based on the data processing and analysis that have been carried out in the previous chapters. In addition, this chapter provides suggestions that may serve as valuable input for future studies related to the same topic or for further development in similar areas.

6.1 Conclusions

This study identified four critical wastes occurring within warehouse operations. The method utilized to determine these critical wastes was Gemba Shikumi. Based on the analysis using the four Gemba Shikumi matrices, the highest Absolute Importance Value (AIV) was found in the storing activity, specifically related to the storage of excess inventory in the aisle, which recorded an AIV of 10. Another critical waste was identified in the checking activity, with an AIV of 7, where the checker confirmed with the picker regarding picking errors or discrepancies in quantity. Additional critical wastes, each with an AIV of 5, were found in the picking and packing processes. These include the picker's effort to search for unavailable items in the dedicated area and the packer's need to revalidate items that had already been checked. These results demonstrate the presence of significant inefficiencies across multiple warehouse functions.

Based on the 5 Whys analysis and Fishbone Diagram, the root causes of critical waste in the warehouse are linked to limitations in both physical infrastructure and systemic management practices. Excess inventory stored in aisles occurs due to the increased volume of finished goods and limited storage capacity. Errors in picking, which require confirmation by checkers, result from the lack of integration between technological systems and human resource planning. The difficulty pickers face in locating items stems from the absence of a proactive and

coordinated inventory management strategy. Meanwhile, the need for packers to revalidate items already checked reflects a quality control system that prioritizes corrective actions over preventive measures. These root causes led to the emergence of several types of waste in the warehouse, including transportation, motion, waiting, and over-processing.

This study proposes the implementation of pallet racking and an RFID-based system as key waste elimination actions to address the identified critical wastes. The application of these strategies is projected to streamline warehouse processes by optimizing space utilization and improving inventory visibility and accuracy. Based on the Process Activity Mapping (PAM) analysis, the proposed improvements are estimated to reduce the total processing time from 9,419 seconds in the current condition to 4,955 seconds in the proposed condition, representing a time reduction of approximately 47.4%. Furthermore, the proportion of Value-Added (VA) activities significantly increased from 49.7% to 89.2%, while Non-Value-Added (NVA) activities were entirely eliminated, demonstrating the effectiveness of the proposed actions in enhancing process efficiency and eliminating unnecessary waste within warehouse operations.

6.2 Suggestions

The company is encouraged to consider addressing other forms of waste beyond the critical ones identified in this study. Tackling additional inefficiencies may serve as a foundation for promoting continuous improvement across warehouse operations, in line with the core principles of lean thinking. Furthermore, although this study demonstrates a significant reduction in processing time through the proposed improvements, it does not explain further the implications of these changes on labor requirements within each warehouse function. Future research is encouraged to assess whether the improved process leads to reduced labor needs, and if so, how surplus operators can be reassigned or reallocated to other areas within the warehouse to support overall operational efficiency.