

**Optimizing Material Ordering and Safety Stock Management in a Push-Pull Production
System: A Car Wash Part Manufacturing Case Study**

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.


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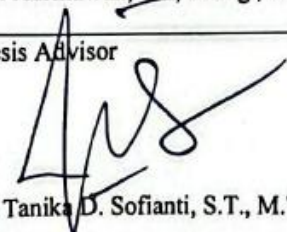
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ABSTRACT

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This research applies quantitative inventory control methods Economic Order Quantity and Periodic Order Quantity at PT. XYZ, a company engaged in manufacturing automated car wash systems. Previously, PT. XYZ did not utilize any standardized calculation to determine order quantities. This led to inefficient ordering, inconsistent material availability, and poor inventory management. To solve this, EOQ and POQ were calculated for key materials to optimize order size and timing, aiming to minimize inventory costs while ensuring stock availability. In addition to inventory issues, PT. XYZ also struggles with the underutilization of its existing web-based system. Many employees still process orders manually, resulting in redundant steps and excessive involvement from the production department. Therefore, this study proposes integrating EOQ and POQ into the web-based system to automate ordering and improve operational efficiency. A simulation using Bizagi was conducted to compare the current and improved business processes. The improved process flow shows a 39.15% reduction in total operational cost and a 46.6% increase in task completion. These findings show that combining EOQ/POQ calculations with digital integration can enhance workflow and decision-making.

Keywords: EOQ, POQ, Web-Based System, Inventory Control, Business Process, Bizagi Simulation.

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DEDICATION

I dedicate this works for Jovanus Adam

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