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**DESIGN OF A SINGLE PLATFORM FOR  
INTEGRATING ERP AND RFID SYSTEMS FOR  
IMPROVED PROCUREMENT PERFORMANCE: A  
CASE STUDY IN THE RUBBER GLOVE  
MANUFACTURING INDUSTRY**

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## DECLARATION

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## ABSTRACT

This study pertains to the limitations of existing Enterprise Resource Planning (ERP) systems and customized systems in Sri Lankan rubber glove manufacturing companies. Manual warehouse management processes lead to inventory inaccuracies leading to high disposal costs, packing material quantity adjustments after annual stock verification, and monthly disposal percentages. Therefore this research aims to design a single platform for integrating ERP and Radio-Frequency Identification (RFID) systems for improved procurement performance taking the rubber glove manufacturing industry in Sri Lanka as a case study. Since the range of inventory items handled in the warehouse is vast, the discussion is only limited to packing materials management. To achieve this aim literature review, semi-structured questionnaires, pilot tests, and semi-structured interviews are used as data collection methods. The validation framework on system performance and procurement performance was developed based on literature reviews. The design of the implemented integrated ERP and RFID system was done based on requirement analysis and literature review. A semi-structured questionnaire was distributed among the rubber glove manufacturers in Sri Lanka and their packing material suppliers, to gather feedback on their ability to attach RFID tags to products and subsequently upload the data into the system following RFID tag reading. The collected survey data were analyzed using descriptive data analysis techniques via SPSS software and the output of the implemented system was observed and recorded during the pilot test. Finally, top management feedback was gathered on the impact of the proposed system on procurement performance.

Integrating RFID technology with ERP systems in the rubber glove manufacturing industry significantly streamlines processes, enhances data accuracy, and improves efficiency. The "Supply Chain Smoother" system, tested at ABC Rubber Glove Manufacturing Company, demonstrated notable improvements in procurement performance as per the analysis and evaluation based on proposed system indicator clusters and procurement performance indicator clusters, proving its critical role in optimizing operations and reducing costs.

**Keywords:** ERP, RFID, Integrated systems, Procurement performance, Inventory accuracy, Rubber glove manufacturer

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## LIST OF ABBREVIATIONS

| Abbreviation | Description                                |
|--------------|--------------------------------------------|
| IT           | Information Technology                     |
| IoT          | Internet of Things                         |
| WMS          | Warehouse Management Systems               |
| ERP          | Enterprise Resource Planning               |
| CPS          | Cyber-Physical Systems                     |
| AGVs         | Automated Guided Vehicles                  |
| JIT          | Just In Time                               |
| RFID         | Radio Frequency Identification             |
| KPI          | Key Performance Indicators                 |
| GRN          | Good Receipt Note                          |
| PMS          | Packing Material Stores                    |
| TSP          | Trimming, Sorting, and Packing             |
| IB           | Inner Bag                                  |
| OB           | Outer Bag                                  |
| IC           | Inner Carton                               |
| OC           | Outer Carton                               |
| HD           | Header Card                                |
| SKUs         | Stock Keeping Units                        |
| PO           | Purchase Orders                            |
| AI           | Artificial Intelligence                    |
| UHF          | Ultra High Frequency                       |
| WIP          | Work-In-Progress                           |
| SCM          | Supply Chain Management                    |
| AIM          | Application Implementation Methodology     |
| BAPI         | Business Application Programming Interface |
| AMT          | Advanced Manufacturing Technology          |
| WM           | Wireless Manufacturing                     |
| ES           | Enterprise Systems                         |
| PI           | Perpetual Inventory                        |
| DC           | Distribution Center                        |
| MRP          | Material Requirements Planning             |
| API          | Application Programming Interface          |
| UI           | User Interface                             |