

**DEVELOPMENT OF A FRAMEWORK TO PROMOTE
AUTOMOTIVE COMPONENTS AND SUB-ASSEMBLY
REMANUFACTURING IN SRI LANKA**

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Thesis/Dissertation submitted in partial fulfilment of the requirements for the degree
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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Devapurage Kasun Lakmal Karunarathna

Date: 11 March 2023

The above candidate has carried out research for the Master's thesis under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of the supervisor: Dr. J. R. Gamage

Signature of the supervisor:

Date:

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ABSTRACT

The growth of remanufacturing strategy has seen its applications in automotive, electronic equipment, furniture, and medical devices in the global product portfolio. Remanufacturing is a promising end-of-life/use product recovery strategy that has been used in the world for decades as a solitary value-adding process that upgrades a used product to the Original Equipment Manufacturers' (OEM) performance specifications.

The growing vehicle fleet in Sri Lanka enables remanufacturing due to multiple reasons. In Sri Lanka, the average service age of a vehicle is extended to more than 30 years. Hence, the demand for spare assemblies and parts continues to increase throughout the usage cycle of a vehicle. On the other hand, brand-new products are not available for older models due to production discontinuation. In such situations, replacing legacy products with a used counterpart of unpredictable quality is the only alternative. In this market context, remanufactured automotive components bring promising business opportunities. However, exploring the existing repairing and servicing practices as potential ventures for remanufacturing has not yet been addressed.

The purpose of this research is to develop a framework for automotive repairing, rebuilding, and remanufacturing practitioners to adopt remanufacturing. A case study based approach was used with semi-structured interviews. A remanufacturing closeness factor was derived for each case company, and a product, process steps, degree of salvage, and performance testing were found and used as the key elements when deriving the closeness factor. Internal and external factors which were prioritized based on the descriptive analysis and used as construct variables in the framework. A framework was developed using Key constructors, namely, core acquisition and reverse logistics; labor skill and availability; remanufacturing process steps, technology, market knowledge, and policy requirements. A multitude of stakeholders could benefit from the developed framework when adopting remanufacturing.

Keywords: Remanufacturing, Automotive Remanufacturing, Remanufacturing Framework, Sri Lanka

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LIST OF ABBREVIATIONS

| | |
|-------|---------------------------------|
| OEM | Original Equipment Manufacturer |
| N/A | Not Applicable |
| Reman | Remanufactured |