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Project Proposal

IE-517 – Closed-Loop Supply Chain Management

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Objective

The purpose of this project is to conduct an in-depth literature review on selected research areas within the domain of Closed-Loop Supply Chain Management (CLSC). The selected topic will be reviewed through a minimum of 10 academic papers, focusing on methodologies, key findings, and research gaps.

You can find a list of candidate research topics in order of preference below.

Candidate Research Topics

1. **Design of Logistics Networks in Closed-Loop Supply Chains**
   This topic looks into how logistics networks are planned to handle both forward and reverse flows. It will cover decisions around facility location, transport, and network structure, with a focus on hybrid systems and sustainability.

2. **Dynamic Lot Sizing Models for Product Recovery**
   This review focuses on how to decide lot sizes over time when dealing with recovered or remanufactured products. It will cover models under both predictable and uncertain conditions, considering demand, returns, and costs.

3. **Determination of Maintenance Levels in Defense Industry and CLSC Relationship**
   This topic examines how CLSC practices like remanufacturing and reverse logistics can support maintenance decisions in defense. The aim is to improve system readiness and reduce costs over the lifecycle.

4. **Defective Product Estimation**

   This topic covers how to predict faulty products before they are returned. It focuses on models that help improve reverse logistics planning and make remanufacturing more efficient.

5. **Integrated Logistics Support Management and Closed-Loop Supply Chains Relationship**

   This review explores how ILS and CLSC can work together, especially in managing complex systems like those in defense. It looks at spare parts, maintenance, and sustainability through the lens of closed-loop practices.