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Cognitive Load and Algorithmic Literacy: Upskilling Gig Workers for Smart and Green Logistics Corridors

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Research Background

Industry Context:

Industry 4.0 to Industry 5.0 reflects a move from automation-driven systems to data-rich, human-centric decision environments.

Rising cognitive load due to constant alerts, multiple dashboards, system variability, and real-time disruptions.

Traditional “operator” role will evolve into a data-enabled decision-maker

The key challenge is ensuring that AI and IoT reduce cognitive burden while enhancing human capability, without deskilling the workforce.

Research Objectives

Industry Context:

- To examine how varying levels of cognitive load influence gig workers' algorithmic literacy,
- To investigate how algorithmic literacy and upskilling readiness influence the relationship between cognitive load and gig workers' capability to operate effectively within smart and green logistics corridors,
- To examine whether digital learning orientation and upskilling readiness modify the relationship between cognitive load and gig workers' capability to participate effectively in smart and green logistics corridors,

Theoretical Framework

The framework draws on cognitive load theory, human–algorithm collaboration frameworks, and sustainable logistics concepts , integrated to formulate testable propositions and hypotheses for future empirical research.

Research Methodology

- Design: Qualitative

  - Literature identification
  - Thematic Categorization and integration
  - Conceptual Model Development

Key Findings

Gig platforms should redesign their interfaces with cognitive load optimization in mind by simplifying data visualization (minimal notifications, progressive task disclosure);

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Training should go beyond operational guidance and include “algorithmic sensemaking” sessions

Policymakers should integrate gig worker upskilling into smart and green logistics corridor policies

Logistics companies should treat gig workers as essential sustainability partners.

Rather than temporary labor, gig workers should be recognized as micro-agents of green transformation.

Academic Contribution

This paper provides a conceptual foundation for understanding the human factors that shape the future of green, smart logistics and offers pathways for training and policy innovation.

As smart and green logistics corridors transform global trade, gig workers must adapt to increasingly automated and sustainability-oriented delivery systems.

Cognitive load and algorithmic literacy play critical roles in shaping workers' ability to upskill and succeed within these digital ecosystems.