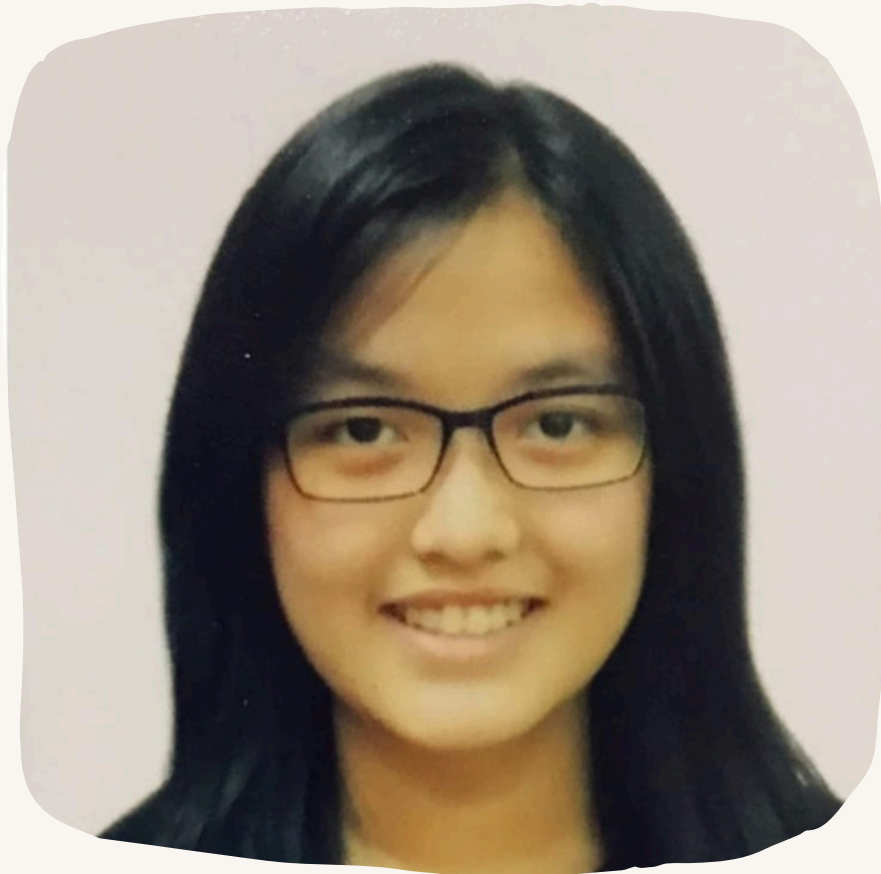# ENTERPRISE INFORMATION SYSTEMS IN MANUFACTURING INDUSTRY

BY Group 13

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INTRODUCTION

Introduction

Definition:

EIS in manufacturing integrates software applications to manage business processes effectively, fostering innovation through process redesign and data analytics.

Evolution:

- Early EIS on mainframe computers served senior executives but lacked universal accessibility.
- Current EIS is company-wide, accessible via personal computers and LANs.
- Empowers employees at all levels to contribute to decision-making.

BENEFITS

Benefits of Implementing EIS

- Streamlined Operations
- Real-Time Data Access and Analysis
- Improved Collaboration and Communication
- Quality Control and Compliance
- Cost Reduction and Efficiency Gains
- Customer Satisfaction and Service Improvement

COMPARATIVE ANALYSIS OF PREVIOUS STUDIES

Comparative Analysis of Previous Studies

	Author(s)	Key Concepts	Weakness of Research
a.	T.S. S95, 2024	Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP) systems	The research lacks real-world case studies, comprehensive evaluation, and critical analysis.
b.	Li et al., 2007	Investigate the motivations behind implementing Enterprise Information Systems (EIS)	Insufficient evidence to demonstrate how the manufacturing setup is interconnected before EIS is implemented.
c.	Qu et al., 2018	Proposed comprehensive Enterprise Information System (EIS) framework	Lacks discussion on the technical aspects of software implementation, potential challenges,
d.	M. Zdravković et al., 2021	Implement artificial intelligence (AI) into Enterprise Information System (EIS)	Lacks implementation and validation in real-world practices

OPINION

a. Implement the combination of Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP) Systems

Introduction

- **Overview**: MES (Manufacturing Execution Systems) and ERP (Enterprise Resource Planning) systems are crucial for modern manufacturing operations.
- **Importance of Integration**
- **Standards for Integration**: The ANSI/ISA S95 standard guides effective integration of MES and ERP within manufacturing enterprises.

Overview of T.S. S95 Article:

- The T.S. S95 article offers a comprehensive examination of MES and ERP integration within the manufacturing industry.
- It explores the functionalities of both the Functional Model and Object Information Model, providing insight into how information is structured and flows within the enterprise architecture.

a. Implement the combination of Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP) Systems

Critique of the Article

Strength

- Thorough Examination of MES and ERP Integration
- Insightful Comparison between Functional and Object Information Model
- Practical Case Study Providing Real-world Application

Areas for Improvement

- Lack of In-depth Exploration into System Interconnections
- Potential Obscurity in Object Information Model

b. **Explores the driving force behind the implementation of Enterprise Information Systems (EIS) in manufacturing companies**

Study Findings

- **EIS Adoption in Manufacturing:**
  - Necessity for improved data management.
  - Boost in operational efficiency.
  - Enhancement in strategic decision-making.
- **Business Planning and EIS Readiness:**
  - Critical to align EIS with organizational goals.
  - Strategic planning essential for EIS integration.
- **Online Business Practices Influencing EIS:**
  - E-commerce trends driving EIS adoption.
  - Digital transformation shaping EIS readiness.

b. Explores the driving force behind the implementation of Enterprise Information Systems (EIS) in manufacturing companies

Emphasis on Validation

- Importance of validating proposed frameworks with real-world evidence for practical applicability.
- Addressing concerns about response rates and empirical validation to strengthen credibility.
- Recommendations for future research to enhance understanding of EIS adoption's influence on manufacturing systems.

Key Takeaways

- Enhanced understanding of how EIS adoption impacts manufacturing, from strategic planning to customer engagement.
- Potential improvements in operational efficiency and customer-centric approaches driven by informed EIS implementation strategies.

c. Implement Business Process Reengineering (BPR) for Enterprise Information Systems (EIS)

Framework Elements:

- Value Creation: Focused on enhancing adaptability and efficiency.
- Functional Structure: Streamlining processes to align with strategic objectives and customer needs.
- Knowledge Management: Enabling autonomous decision-making and innovation through efficient knowledge utilization.

BPR Procedure:

- AS-IS Model: Analyzing current processes using tools to identify issues.
- TO-BE Model: Designing improved processes aligned with strategic objectives and customer requirements.
- Feasibility Analysis: Assessing proposed models' efficiency and effectiveness through quantitative analysis and end-user validation.

d. Implement Artificial Intelligence (AI) Into Enterprise Information Systems (EIS)

AI Techniques:

- Machine Learning (ML): Used for predictive maintenance, anomaly detection, and sales forecasting.
- Deep Learning: Utilizing Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) for quality control and process monitoring.
- Transfer Learning: Adapting pre-trained models to new domains, showcasing algorithm adaptability.
- Logic-Based Methods: Including deductive logic systems and Multi-Agent Systems (MAS) for autonomous decision-making and interoperability.
- Explainable AI (XAI): Addresses bias concerns and ensures model transparency, fostering trust and regulatory compliance.

d. Implement Artificial Intelligence (AI) Into Enterprise Information Systems (EIS)

Impact on Manufacturing:

- Optimizes processes such as quality control and supply chain management.
- Enables autonomous decision-making and reasoning.
- Addresses complex challenges like predictive maintenance and automated transportation.
- Drives innovation and competitiveness in manufacturing enterprises.

FUTURE TRENDS AND DIRECTIONS IN EIS FOR MANUFACTURING

FUTURE TRENDS AND DIRECTIONS IN EIS FOR MANUFACTURING

- Cloud-Based Solutions
- Advanced Analytics and AI/ML
- Cybersecurity and Data Privacy

CONCLUSION

Conclusion

- EIS plays a critical role in enhancing efficiency within manufacturing.
- While there's progress with MES and ERP integration, challenges persist.
- Understanding the motivations behind EIS adoption, such as improved planning and responsiveness to market dynamics.
- Leveraging AI and BPR can further enhance operational effectiveness.
- Addressing heterogeneity is key to developing new EIS architectures.
- Ensuring wise utilization and ongoing investigation of EIS is vital for innovation and efficiency.

Thank you!