



# A STUDY ON ROLE OF DIGITAL SUPPLY CHAIN MANAGEMENT IN MITIGATING FINANCIAL RISKS AND ENHANCING PROFITABILITY IN THE CONSTRUCTION AND REAL ESTATE INDUSTRIES

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## ABSTRACT

This research paper shows the Construction and real estate industries are highly susceptible to financial risks due to cost overruns, supply chain disruptions, and inefficiencies in procurement and logistics. Digital Supply Chain Management (DSCM) has emerged as a transformation approach to mitigating these risks while enhancing profitability. This study explores the role of DSCM in optimizing procurement, inventory management, and logistics through technologies such as Artificial Intelligence (AI), Blockchain, Internet of Things (IOT), and Big Data analytics. By improving real-time visibility, predictive analytics, and automation, DSCM minimizes financial losses caused by delays, material shortages, and market fluctuations. Additionally, the research highlights case studies demonstrating cost savings, increased operational efficiency, and improved project timelines in construction and real estate firms that have integrated DSCM strategies. The findings suggest that adopting DSCM can lead to enhanced financial stability, competitive advantage, and long-term profitability in these industries.

**KEYWORDS:** Digital Supply Chain Management (DSCM), Construction Industry, Real Estate, Automation, Profitability, Internet of Things.

## INTRODUCTION

The construction and real estate industries faced many financial risks, such as cost overruns, delays, and supply shortages. Managing these risks is crucial for companies to remain profitable. One of the best ways to reduce these risks is by using Digital Supply Chain Management (DSCM). This modern approach uses technology to improve the flow of materials, data, and finance making construction and real estate projects more efficient.

### 1.1 Background

Traditionally, supply chain management in construction relied on manual processes, paper-based orders and face-to-face communication. These outdated methods often led to miscommunication, delays, and increased costs. Overtime, industries began adopting digital solutions such as software for tracking materials, automations for inventory management and data analytics for better decision-making.

### 1.2: Historical Development

- **Pre-1990s:** - Construction supply chains were mostly manual, involving direct communication with suppliers and handwritten records. Delays and mismanagement were common.

- **1990s-2000s:** -The introduction of Enterprise Resource Planning (ERP) systems helped companies track materials and finances more effectively.
- **2010s:** -The rise of cloud computing, data analytics and automation made supply chain management more efficient and transparent.
- **2020s and Beyond:** -Digital technologies such as Artificial Intelligence (AI), Blockchain and the Internet of Things (IOT) are revolutionizing supply chain management, allowing real-time tracking and better risk management.

By embracing DSCM, construction and real estate companies can reduce cost, prevent project delays, and increase profitability, making their businesses more competitive in today's fast-paced market.

### 1.3 Definition and key terms

- **Digital Supply Chain Management (DSCM):** The use of digital technologies to manage, monitor, and optimize supply chain operations in real-time.
- **Financial Risks:** Potential monetary losses due to market fluctuation, delays, or inefficiencies in operations.
- **Construction Industries:** A sector involved in building infrastructure, residential, and commercial properties.



- Real Estate Industry: The business of buying, selling, or renting land, buildings, and housing
- Profitability: The ability of a company to generate profit from its operations after expenses.

- Market reports and investment analyses from financial institution focused on real estate technology.
- Examples of firms that have successfully adopted digital supply chain system to improve financial performance.

#### 1.4 Research Gaps

The specific use of digital supply chain management (DSCM) in the construction and real estate sectors and its effects on financial risk mitigation and profitability remain under-marked. Most research focus on DSCM in retail and manufacturing, with minimal attention begin paid to cost inflations, payment delays, and market fluctuation. Most studies agree that blockchain, AI, and IoT enhance operational efficiency, but the scope of financial benefits to construction and real estate firms in inadequately explored. More focus should be directed to how DSCM strategies in this sector can assist firms in managing risks, minimizing costs, and enhancing financial control.

#### 1.5 Research Objective

Here are some research objectives

- Understand Digital Supply Chains: Understand the application of introduction technology in the management of supply chains in construction and real estate.
- Identify Financial Risks: Determine the particular financial risks prevalent in these industries and their impact on businesses.
- Explore Risk Reduction: investigate the role of digital supply chain management in mitigating financial risks (e.g. cost overruns and delays).
- Analyze Profitability Impact: Evaluate the impacts of profit achieved by real estate and construction companies with the incorporation of digital technologies into supply chains.
- Recommend Best Practices: Outline reasonable criteria for risks and earnings management to be achieved through effective utilization of digital supply chain management by businesses.

## MATERIALS AND METHODS

### 2.1 Step by step procedures

1. Data collection: Collecting data from companies using surveys, interview, and financial reports.
2. Financial Ratios Calculation: Calculating key ratios like profit margin, ROI, and cost efficiency before and after using digital tools.
3. Trend Analysis: Analyzing financial performance and risk levels over times.
4. Comparative Analysis: Comparing companies that use digital supply chains with those that don't use.
5. Interpretation and Discussion: understand the impact of digital tools on reducing financial risk and increasing profits.

### 2.2 Resource

The research utilizes secondary data, such as

- Financial reports from digitally enabled construction and real estate companies.

## FINDINGS AND RESULTS

### 3.1 Importance

In sectors like real estate and construction, digital supply chain management (DSCM) has become crucial because

- High Complexity: These sectors have complicated timelines, a large number of stakeholders, and a lot of materials.
- Financial Vulnerability: ineffective procurement, delays, and cost overruns raise financial risks.
- Real-time Visibility: It is essential for risk detection, inventory control, and accurate forecasting.
- Regulation and Sustainability: Digital systems aid in waste reduction and compliance.

### 3.2 Methods

These are the quantitative analytical methods that are employed

1. Ratio Analysis: Ratio analysis will be used to measure financial health and performance indicators before and after the installation of DSCM solutions.
  - Profitability ratio: (e.g., Net profit margin, Return on Assets)
  - Liquidity ratio: (e.g., Current ratio, Quick ratio)
  - Efficiency ratio: (e.g., Inventory turnover, Days sales outstanding)
  - Leverage ratio: (e.g., Debt-to-Equity ratio)
2. Trend Analysis: Considering trends in financial performance over time to determine improvement attributed to digital SCM uptake.
3. Comparative Analysis: Comparing between financial metrics in companies with and without digital SCM to gauge relative effect.
4. Cash flow Analysis: Examining cash inflow and outflow to identify the impact of digital SCM on liquidity and operational effectiveness.

### 3.3 Impacts

- Improved cost control: Real-time tracking and predictive analytics reduce unexpected expenses and budget overruns.
- Enhanced Transparency: Digital tools offer better visibility into the supply chain, minimizing fraud and procurement errors.
- Risk Mitigation: Early identification of potential disruption helps avoid project delays and financial penalties.
- Increased Operational Efficiency: Automation and integration reduce manual processes, lowering labor costs and time delays.



- Better Supplier Management: Digital platform streamlines communication and performance tracking, ensuring timely and cost-effective sourcing.
- Customer Satisfaction: Efficient processes lead to timely delivery and quality outcomes, enhancing brand value and profitability.

## CONCLUSION

By integrating Digital Supply Chain Management (DSCM) into the business processes of construction and real estate value chain is a milestone towards improving their financial results and mitigating the risk associated with real estate projects. As the industries moves from the manual operations to more automated solutions, companies are in a better position to manage the complexities such as controlling cost, managing delays, and inefficient procurement processes. This study demonstrates how DSCM can enhance profitability, manage operational costs, and secure a competitive edge in an environment dominated by technology and data analytics.

### 4.1 Key Findings

- The adoption of ERP, AI, blockchain, and IOT technologies by construction and real estate firms is facilitating the automation of previously manual business processes.
- Companies mitigate cost and project delay challenges through the use of digital supply chain by real time tracking and intelligent predictive analysis.
- Return on investment, Profit margin, and cost management are all higher for companies that utilize digital technologies compared to those that do not.
- Enhanced supply chain visibility allows timely problem identification, avoidance of missteps, and improved control within the supply chain.

### 4.2 Implications

- Industries practitioners: Construction and real estate companies need to direct their focus and resource towards digital system to remain industry leaders, protect their investment, and improve their profit margins.
- Policymakers and Regulators: Policies that support and promote the use of technology especially in the context of transparency and environmental sustainability should be put in place.
- Research and Academics: Research needs to be concentrated more on the financial implications of DSCM on construction and real estate, particularly relating to cost management with its optimization through blockchain and AI technology.
- Technology Provider: there is considerable unserved demand in construction and real estate supplied with DSCM that is specially designed for these industries with respect to ease of optimization, scalability, and functionality.

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