# A Study of Technology Based Software Solutions for Supply Chain

DATTATRAYA SURESH UTEKAR[1], KESHAV KUMAR[2]
[1, 2] *Department of Management Studies, Alamuri Ratnamala Institute of Engineering and Technology, University of Mumbai*

## I. INTRODUCTION

This paper provides a comprehensive and systematic literature review focusing on the evolution of digital supply chains (DSC) and the integration of seven critical technologies IoT & RFID, 5G, 3D Printing, Big Data (BD), Blockchain, Digital Twins (DT), and Intelligent Autonomous Vehicles (IAVs). It explores how these technologies collectively and individually transforms supply chain efficiency, visibility, and flexibility in a highly dynamic digital environment.

## II. OBJECTIVES

- To examine the current state of application and development trends of key digital technologies in supply chain management.
- To analyze the advantages, limitations, and implementation barriers of each technology.
- To identify knowledge gaps and propose a development framework aligning digital technologies with supply chain strategies.

## III. MATERIALS AND METHODS

The study employed a systematic literature review methodology using major academic databases such as Scopus and Web of Science. Articles were screened and categorized based on their focus on specific technologies and their application domains within supply chains. The researchers also conducted a comparative analysis of the performance and maturity levels of these technologies

## IV. RESULTS

The analysis revealed that each technology offers unique benefits:

- IoT & RFID enhance real-time visibility and tracking.
- 5G enables faster communication and data transmission.
- 3D Printing supports customization and localized production.
- Big Data improves predictive analytics and decision-making.
- Blockchain ensures transparency and trust in transactions.
- Digital Twins enable virtual simulations and system optimization.
- Intelligent Autonomous Vehicles enhance automation in logistics.

However, integration challenges such as interoperability, data security, and high implementation costs remain.

## V. CONCLUSION

The review concludes that the convergence of these seven technologies has the potential to create fully digitalized, intelligent, and adaptive supply chains. However, achieving this requires overcoming interoperability barriers and developing a unified data management framework.

## VI. FUTURE DIRECTIONS

Future research should focus on:
- Cross-technology integration models for synchronized data exchange.
- Scalability of DSC technologies in SMEs.
- Sustainability impacts of digital technologies.
- Policy and governance frameworks for ethical and secure deployment of DSC innovations.

REFERENCES

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