

## **Abstract**

This research investigates the role of data analytics in enhancing supply chain transparency, focusing on how data-driven insights can improve visibility, traceability, and accountability across the supply chain. With increasing global complexity and consumer demand for ethical sourcing, businesses are seeking ways to ensure their supply chains are transparent and efficient. Data analytics provides the tools necessary to monitor supply chain activities in real time, identify bottlenecks, and ensure compliance with regulatory and sustainability standards, ultimately fostering trust and improving operational performance.

A mixed-methods approach is employed to offer a comprehensive analysis of how data analytics contributes to supply chain transparency. The quantitative phase involves analyzing supply chain data, such as inventory levels, lead times, and supplier performance, to develop predictive models that enhance decision-making and increase transparency. Statistical methods are used to assess the effectiveness of analytics in identifying inefficiencies and potential risks. The qualitative phase consists of interviews with supply chain managers, data scientists, and industry experts to understand how data is leveraged in practice, the challenges faced, and the benefits of implementing data analytics for transparency.

The findings from this study highlight the transformative potential of data analytics in improving supply chain transparency. By integrating both quantitative insights and expert perspectives, the research provides actionable recommendations for businesses seeking to use data analytics to optimize supply chain operations, build consumer trust, and enhance overall supply chain resilience.