

A STUDY ON AGILE AUTOMATION IN SUPPLY CHAIN MANAGEMENT

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Paper Received: 12.11.2021 / **Paper Accepted:** 04.12.2021 / **Paper Published:** 07.12.2021

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Abstract

Agile procedures have had a significant rise in popularity in recent years and have quickly become a widely accepted approach to development. As more organisations embrace agile practises, agile itself is also evolving to better suit the needs of the workplace. The growing acceptance of agile practises is evident in the rejection of rigid adherence to established principles. India is progressing towards providing high-value and advanced quality engineering products and services for multinational corporations. India serves as a significant hub for automobile manufacturers, both domestically and as a crucial link in the global automotive supply chain.

Keywords: Supply Chain Management, Agile, Automation, Economy, Demand.

Introduction

From an analytical perspective, a supply chain can be defined as a network of interconnected cells that handle the processing of materials and possess qualities related to supply, transformation, and demand. Supply chain management involves overseeing a network of interrelated businesses that work together to provide the required products and services to the end customer. Supply chain management involve the logistics of transporting and storing raw materials, work-in-progress inventory, and finished commodities from the production facility to the point of consumption. An effective supply chain and logistics system, enabled by proficient specialists who utilise optimal processes, is essential for succeeding in this challenging and continuously changing market.

An eminent feature of the present-day global economy is its reliance on huge supply chains that span throughout the entire globe. However, the growing reliance on supply chains has resulted in a heightened recognition that these complex networks are vulnerable to interruption. Furthermore, these pivotal economic systems have substantial impacts on other vital areas, such as the ecology and social structure of our planet, particularly in relation to sustainability.

Literature Review

Masoumi (2019) [1] The transition from a conventional supply chain to a sustainable supply chain has been implemented across several industries for a considerable period of time. The automotive industry, as one of the largest and most prominent sectors globally, has the potential to significantly impact the transition towards a sustainable society. Although there is an increasing amount of literature in the area of sustainable supply chain management, there is currently no review article that thoroughly combines and summarises the latest research in the automotive sector. In order to address this deficiency, the present study examines the existing body of literature on sustainable supply chain management in the automotive sector, specifically focusing on publications from 1995 to 2017. A comprehensive review and content analysis were performed to gather the studies and examine their content. The content analysis was organised according to a set of fundamental business processes using the Integration Definition Function method,

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which is a systematic approach to analysing business processes. The study offers a pragmatic framework for developing an environmentally-friendly automotive supply chain. It concludes by identifying the research areas that need further exploration and providing suggestions for future studies.

Angappa (2019) [2] The significance of agile manufacturing and its associated supply chains in attaining sustainable competitiveness for businesses has been widely recognised by both scholars and professionals. Nevertheless, there has been minimal, if any, investigation into the development of procedures within agile manufacturing supply chains and their correlation with competitive performance goals. In order to fill this need, we conducted a comprehensive analysis of the existing research on agile manufacturing. This analysis focused on the development of manufacturing agility, the characteristics of agile manufacturing, the factors that drive agile manufacturing, and the identification of the skills and abilities necessary for implementing agile manufacturing. Our hypothesis posits that agile manufacturing plays a pivotal role in attaining a lasting competitive advantage, particularly in the face of present unparalleled market volatility and intricate client demands. Agile manufacturing prioritises responsive adaptation to counteract the negative impact of competitive demands on an organization's performance objectives. We have identified five enabling competencies that serve as the catalysts for agility in agile manufacturing. These competencies include transparent customization, agile supply chains, intelligent automation, total employee empowerment, and technology integration. We have also examined how these competencies can be combined to generate positive multiplier effects. Additionally, suggestions were made for future research on the implementation of the five identified factors that facilitate agile manufacturing. Furthermore, the potential impact of emerging technologies such as big data, blockchain, and Internet of Things on shaping future agile manufacturing practises was discussed.

Analysis

The implementation of agile automation in supply chain management is a revolutionary strategy that is redefining the way in which firms organise their operations. A level of agility and responsiveness that has never been seen before is achieved by supply chains through the combination of Agile concepts and modern automation technology. Through this integration, activities throughout the supply chain are streamlined, ranging from inventory management to transportation and distribution.

This enables rapid adaptations to changing market dynamics and the expectations of customers. In the

same way that automation makes use of data insights to facilitate informed decision-making, the iterative approach that Agile takes helps to drive ongoing improvements within these processes. It is possible to establish collaborative ecosystems, which would improve communication and cooperation among many parties. Supply chains become more resilient as a result of automation by optimising inventories, logistics, and predictive analytics.

This allows supply chains to be able to proactively manage disturbances and maintain operational continuity. In general, the combination of Agile concepts and automation equips supply chains with the ability to function in a manner that is flexible, efficient, and responsive in the rapidly changing business environment of today. Agile automation in supply chain management is a revolutionary method that utilises both the principles of Agile and the technologies of automation in order to optimise and revolutionise the processes that are traditionally involved in supply chain management. This is a rundown of the effects that it has:

Enhanced Responsiveness: Supply chains are able to promptly adjust to changing market needs, consumer preferences, and unexpected disruptions when agile automation is implemented. The use of automation technologies helps to streamline processes such as inventory management, order processing, and logistics, which in turn enables organisations to make rapid adjustments in response to real-time data insights.

Iterative Supply Chain Processes: Agile approaches promoted iterative cycles of improvement when applied within the context of supply chain management. The utilisation of automation in these iterative cycles allows for the ongoing refinement and optimisation of processes, which ultimately results in higher efficiency and decreased lead times.

Automation systems provide a lot of data within supply chains, which may be used to drive decision-making based on the data. The concepts of agile development place an emphasis on the use of this data for the purpose of making informed decisions. This enables supply chain managers to make modifications that are data-driven and nimble, which in turn improves operational efficiency and resource allocation.

Agile principles encourage collaboration among various stakeholders, which results in a collaborative supply chain ecosystem. Automation makes it possible for suppliers, manufacturers, distributors, and retailers to communicate and collaborate in a smooth manner, which in turn

enables a supply chain network that is more integrated and responsive.

Automating inventory management through the use of technology such as RFID, Internet of Things sensors, or demand forecasting backed by artificial intelligence provides a more efficient inventory management process. This ensures that proper inventory levels are maintained, hence decreasing stockouts and minimising the expenses associated with surplus inventory.

Automation in logistics, such as route optimisation, automated storage systems, and autonomous vehicles, contributes to increased agility in distribution operations. Adaptive logistics and distribution are two examples of this. Deliveries may be made more quickly and accurately, resulting in a reduction in both transit times and expenses.

Agile automation helps to construct supply chains that are resilient to disturbances, which means they are able to mitigate risks and recover quickly from disruptions. Through the use of predictive analytics and automation, possible disruptions can be identified at an earlier stage, which enables proactive adjustments to be made in order to reduce their impact.

A transformation in culture, the incorporation of new technologies, and the reengineering of processes are all necessary steps in the implementation of Agile automation in supply chain management. On the other hand, it promises to develop supply chains that are more responsive, efficient, and adaptable, and that are able to satisfy the ever-changing demands of modern markets.

Conclusion

This study is to provide businesses with a thorough guide that will assist them in discovering their way through the complex landscape of agile automation. The purpose of this study is to provide readers with a detailed knowledge of how this paradigm shift in operations is not only imminent but also vital for organisations that are aiming to survive in the digital age. This is accomplished by synthesising empirical evidence, expert viewpoints, and theoretical frameworks. One of the most significant changes that has occurred in the way that business's function is the combination of automation and the Agile Principles.

- The ability to adapt in an iterative manner is a feature of agile approaches like as Scrum and Kanban, which facilitate iterative development and align neatly with automation. The use of automation helps to speed up these iterative cycles, which in turn ensures that the organisation can

quickly adjust to shifting market dynamics or specific requirements.

- Efficiency achieved through automation: Automation technologies improve operational efficiency by simplifying and streamlining procedures that are repetitive. The concepts of agile development complement this by allowing teams to concentrate on tasks with a greater value, which in turn fosters efficiency and innovation.
- Data Driven: Automation generates enormous amounts of real-time data, which enables real-time decisions to be driven by that data. This data is utilised by agile principles in order to provide direction for decision-making, which enables rapid adjustments and enhancements to be made during iteration cycles.
- Methodology: Agile methodology places a strong emphasis on collaboration between teams that work in different functional areas. Through the provision of a shared platform for team communication and task management, automation technologies facilitate the execution of workflows in a smooth manner, hence enhancing the effectiveness of collaboration.
- Continuous Improvement: A culture of continuous improvement is fostered by both the Agile methodology and automated development. The principles of agile development encourage teams to evaluate their performance at the end of each cycle, and automation technologies make it easier to analyse data in order to pinpoint areas that could use improvement.
- Enhanced Transparency and Feedback Loops: The Agile methodology places a strong emphasis on continuous feedback and transparency, which aligns well with the capability of automation to deliver comprehensive analytics and performance data. With the help of this integration, teams are able to make decisions based on data and immediately adjust their strategies based on feedback.

When Agile Principles and automation are combined, a tremendous synergy is created. This synergy enables organisations to function with increased efficiency, responsiveness, and innovation in the face of a constantly shifting business landscape.

Conflicts of Interest Disclosure

The authors declare that there are no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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