



# AMPLIFYING SUPPLY CHAIN PERFORMANCE: THE POWER OF GENERATIVE AI COMBINED WITH TRADITIONAL AI

## Abstract

In today's competitive environment, AI and Generative AI are no longer luxuries, but necessities. They offer a wealth of evolving applications, especially in the supply chain, impacting costs, revenue, and customer experience. This point of view discusses the practical applications of AI and Generative AI in real-life supply chain scenarios.



## GenAI: The buzzword

The IBM Institute of Business Value conducted a study in the first quarter of 2024 with top supply chain executives

across industries to understand how they perceive Generative AI impacting supply chain processes. The results seem to be in

line with the disruption being caused by Gen AI in other business functions.

## GenAI is expected to impact many supply chain processes

When asked where they expect generative AI to impact the supply chain processes, more than half of the respondents chose providing self-service to customers.

Other expected impact areas include analysing and processing orders, demand forecasting, and analysing and optimising inventory.

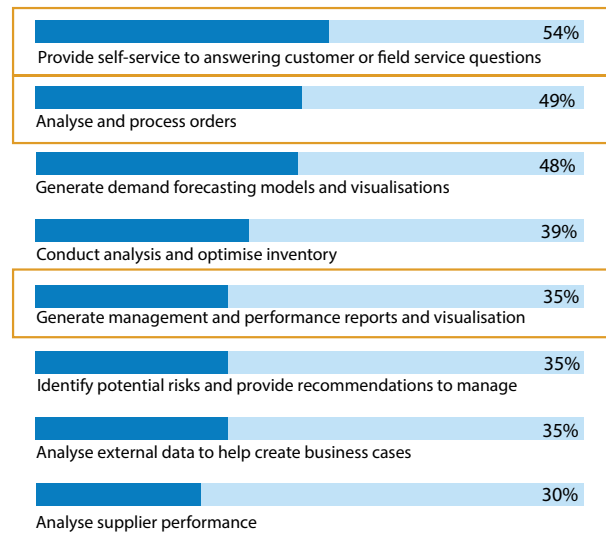


Figure 1: Generative AI usability across supply chain processes

## Traditional AI vs Generative AI: What is the real difference in a supply chain context?

The supply chain has been one of the forefront functions to elevate the usage of automation from traditional rule-based robotic automation to advanced cognitive

automation that can perform scenario-based decision-making. Some of the examples include dynamic credit clearance based on a preset boundary condition,

simulating inventory patterns and dynamic allocation in order management.

The next generation of technology enablement in the supply chain came about by using AI for forecasting and inventory management processes. It helped in predicting demand plans by combining statistical forecasting based on historic demand and bottom-up forecasts from the sales team to arrive at

best-fit algorithms, prescribing alternative scenarios to optimise the cost and maximise revenue.

The latest technology, Generative AI in the supply chain is beyond traditional AI. It not only predicts and prescribes actions but goes above and beyond to create new sets of data like market insight based on

competitive landscape, intelligent order promise and proactive alerts on order status. These new data sets are created by combining completely unlinked information from multiple data sources and arriving at a logical correlation between them, making them close to human ability and creativity.

## Generative AI as the game changer for supply chain

The supply chain industry is on the cusp of a transformation. Generative AI, unlike fleeting trends, has the power to be a game-changer. Its capabilities are awe-inspiring, prompting a sense of wonder and, perhaps, a hint of apprehension about what the future holds.

Let's start by exploring some fundamental concepts of Generative AI before delving deeper.

### Platform and data foundation for Generative AI

Successful generative AI implementation hinges on a robust platform and high-quality data. The ideal platform must be secure, scalable, and flexible to accommodate diverse AI models and

workloads. It should align with responsible AI principles and leverage existing cloud resources for cost-efficiency. Additionally, strong community support is essential. Master data management is paramount for providing context and accuracy to AI models. By organising and harnessing data effectively, organisations can generate valuable insights and improve decision-making.

### Prompt engineering as a catalyst

While powerful generative AI models are readily available, fine-tuning prompts is crucial for optimising performance and tailoring models to specific use cases. Techniques like zero-shot, single-shot, and few-shot learning can be employed

to achieve this. Effective prompts are clear, concise, and action-oriented, often incorporating visual elements. Progressive disclosure, contextualisation, and user feedback mechanisms enhance the overall user experience. By mastering prompt engineering, organisations can unlock the full potential of Generative AI and drive meaningful business outcomes.

With such a foundation in place, Generative AI can increase efficiency, effectiveness, and experience in the supply chain lifecycle. See the following illustration to explore how it revolutionises every stage of the supply chain.

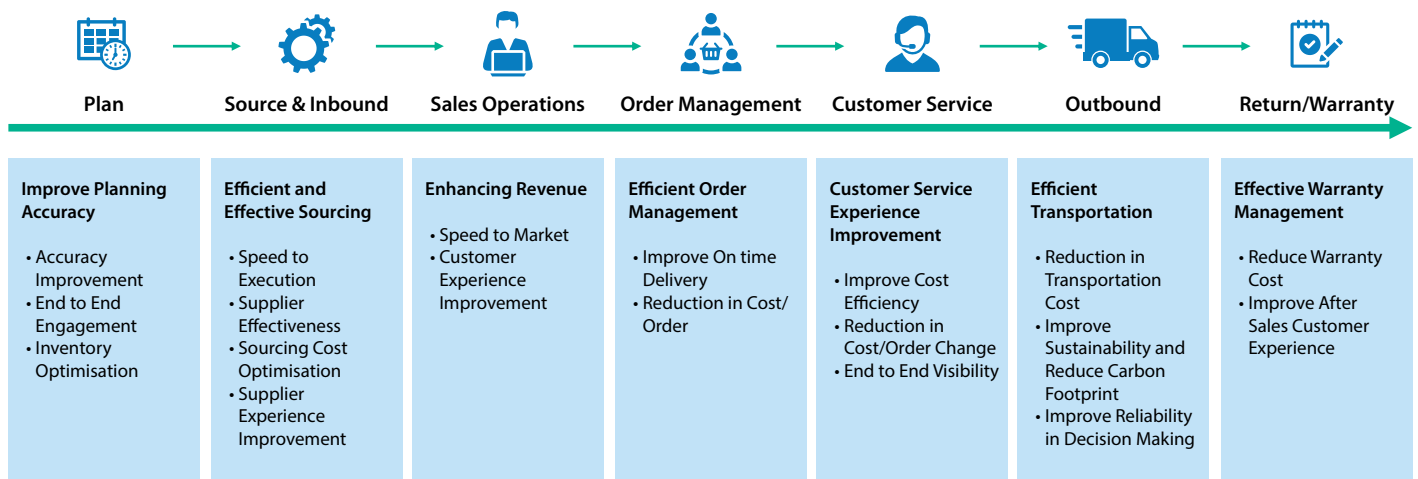


Figure 2: Typical outcomes expected from Generative AI across the chain

As seen above there are far-reaching benefits of Gen AI in the supply chain lifecycle, however, there is merit in diving deeper into each stage to see the potential impact of AI and GenAI on the business value chain.

The following illustration highlights the typical effort allocation across the supply chain lifecycle and the potential positive impact of AI/GenAI interventions (represented by low/Medium/High). This

data showcases the significant value these technologies can unlock across the entire organisation.

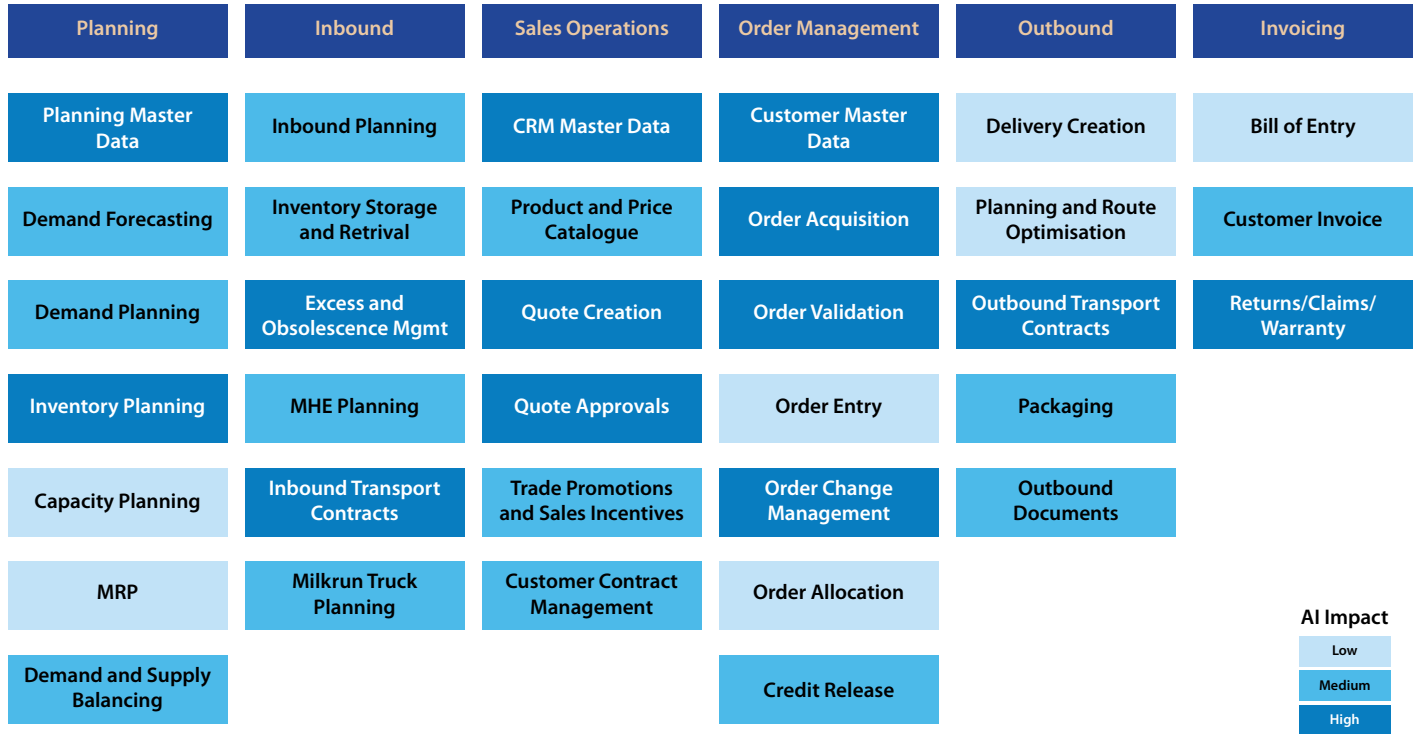


Figure 3: Typical human effort that Generative AI could impact

## A few examples of typical applications of Gen AI across the value chain of supply chain operations

### 1. Improvement of accuracy in supply chain master data:

With the ever-changing customer and market demands, establishing and maintaining accurate supply chain master data – including material, planning and customer parameters – has become a complex and time-consuming activity. Businesses now face the dual challenge of not only keeping this data up to date but also ensuring its complete accuracy.

AI simulations can optimise planning parameters like reorder point, reorder level, and safety stock, striking the ideal balance between service levels and inventory. Generative AI algorithms can further enhance this process by enriching the

master data with external sources like Dun & Bradstreet thereby ensuring “Get Clean and Keep Clean”.

### 2. Demand forecasting:

It is challenging to accurately predict the demand due to the continuously changing market conditions. Traditional forecasting models use historical demand and statistical techniques to suggest the best-fit forecast.

In addition to advanced time series algorithms like ARIMA-Bootstrap, and prophet models, newer models like state space, vector autoregression, and long short-term memory (LSTM) can be leveraged to include external factors like market dynamics to improve forecasting

accuracy. Additionally, Generative AI based diffusion models can be used to capture how information, innovations, or behaviours spread through a population over time.

### 3. Inventory optimisation:

Inventory forecasting is critical for organisations to manage their costs. Deciding on the impact of incorrect inventory levels leading to missed sales opportunities or increased working capital makes it a suitable candidate for AI and Generative AI interventions.

AI can be used to analyse input variables like lead times, supplier reliability, forecast accuracy, etc. to calculate safety stock settings. Generative AI can simulate various

scenarios jointly with human intervention and help organisations fix the right inventory levels.

#### 4. Sourcing and procurement:

Sourcing and procurement are vital functions in any organisation as they are responsible for a significant portion of the organisation's expenditure. Therefore, it is crucial to consider the use of AI and generative AI technology.

Generative AI can be used to create comprehensive RFP documents, assess responses, and develop robust contracts with necessary liability clauses. AI interventions can aid in supplier choice by using external data to evaluate and qualify the suppliers systematically.

#### 5. Sales operations

The sales operations functions play a crucial role in product placement, promoting sales growth, and managing the sales network using incentives and discounts. Organisations use various sales channels, and one of the primary channels in recent times is the online platform.

With the right AI interventions, organisations can use market data to develop product placement and pricing strategies and time their product launches

through the right channels. Generative AI can analyse social media to find sales strategies by comparing them with market conditions and the competitor landscape.

#### 6. Order management

Customers place orders through various channels and expect a seamless omnichannel experience. A significant amount of effort is dedicated to order acquisition, document extraction, validation of business rules and entering orders into order management systems.

Both accuracy and speed provide a competitive advantage to the organisation.

Generative AI can function as a front-end interface, interacting with customers throughout the ordering journey. This allows for an omnichannel experience, facilitating order placement, changes, and status inquiries. Additionally, AI models can predict potential order holds and backlogs, proactively reducing delays and enhancing the customer experience.

#### 7. Outbound and transportation management

After globalisation, the supply chain has seen drastic growth where products can be manufactured, sourced, and delivered from anywhere globally. In these conditions

transportation management is vital. Multiple cross-border documentation and regulatory requirements exist for organisations to move goods from one place to another. Not adhering to these regulatory requirements may lead to huge fines and impact on the reputation of the organisation.

Generative AI can guide employees on the right documentation requirements and provide all the necessary process steps to meet the right statutory requirements.

#### 8. Warranty and claims

Organisations lose millions of dollars annually due to improperly managed warranty claims. Not honouring valid claims damages customer experience and leads to revenue loss. Conversely, missing fraudulent claims erodes profit.

Generative AI can help us understand our customers better and make smarter decisions about warranties and returns. For example, imagine AI analysing past customer behaviour. If someone often returns items, the AI could flag them and suggest a suitable return fee structure. This helps ensure fairness for everyone.



## Conclusion and future outlook

Adopting AI and Generative AI isn't optional; it's essential. These technologies offer a multitude of evolving use cases, particularly within the supply chain, which directly affect cost, revenue, growth, and customer experience. Therefore, selecting the right technology platform

and investing in high-impact use cases becomes crucial. This ensures a maximised return on investment (ROI) with minimal risk.

Generative AI paves the way for a larger vision in the supply chain industry: building autonomous, resilient systems

that mitigate risk and yield higher profits. Organisations that embark on their generative AI journey will now become early adopters, fostering growth and securing a competitive edge in the market.

### Authors



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Karthikeyan leads the digital transformation of supply chain processes at Infosys BPM and is globally responsible for digital solution design and delivery. He has successfully driven digital transformation for leading clients in the US and Europe, delivering immense business value to clients.

Having joined Infosys BPM in 2017, Karthikeyan has worked with multiple clients to provide supply chain consulting and advisory services across industry verticals such as manufacturing, Hi-tech, and CPG. He has 24 years of experience in various facets of supply chain globally. Prior to joining Infosys BPM, he has worked with Daimler, Nokia, and Godrej, in managing supply chain operations, technology transformation and business excellence.

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