



Implementation of Artificial Intelligence in the FMCG Industry and Its Impact on Logistics Management

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Abstract: The FMCG industry primarily deals with the manufacture, distribution, and marketing of a wide variety of mostly ready-to-use consumer goods. The company profiled in this study is part of the FMCG industry. The study is being carried out to determine the impact of artificial intelligence on the logistics of the company's supply chain. Artificial Intelligence (AI) is clearly at the centre of potentiality in the modern world, with a rapid push for development. When it comes to innovative levels of enablement, it is often known as the "technical forerunner." It extends far through vertical functions with its potential power and influence. The use of AI certainly brings its advantages to the field and especially to the SCM functions, starting from the procurement of the raw materials to the delivery of the finished goods.

The research also aims to demonstrate the benefits or advantages provided by AI in procurement and supply chain management through the use of a specific software used in better routing transportation (logistics) in the company. The working model and related evidential data are provided along with the required statistical information. Thus showing the merits provided by the usage of artificial intelligence in a particular sector and also leading to the total benefit of the supply chain of the particular business firm. The research is carried out in light of the data provided by Crofarm, their employees, employers, and customers. The primary concern is the application of AI in logistics and its later outputs, which will reflect on the whole supply chain, along with customer satisfaction and market demand.

Key Words: FMCG Industry, Artificial Intelligence, Logistic Management, Regression, SCM

Introduction

It is well known that the complexity of supply chains is increasing and the margin for error is decreasing. Maximizing efficiency by reducing uncertainties and waste of all kinds becomes much more important with rising competition in the modern world. The face of the supply chain industry is already starting to shift artificially, which would further cause rapid fluctuations in the basic structure of every industry. Artificial intelligence drives enterprise-wide insight into all facets of the supply chain and methodologies by taking out deep-rooted inefficiencies and uncertainties that people simply cannot mimic on a simple scale. In supply chains, AI helps maximise the capacity needed for more precise planning of resources, increased efficiency, high quality, lower costs, and higher performance, all while promoting a safer working environment.

Artificial intelligence (AI) is clearly at the centre of potentiality in the modern world, with a rapid push for development. When it comes to innovative levels of enablement, it is often known as the "technical forerunner." It extends far through vertical functions with its potential power and influence. From finance to pharmaceuticals, logistics fleets to CRM, in every market, AI affects nearly every layer of the modern organization. The use of

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This has not gone unnoticed or unaccounted for in the lines of business leading from the operations floor right up to the C-suite, which is increasingly acknowledging the potential opportunities surrounding AI, as well as the processes, platforms, and risks that underlie it. AI's efficiency and insights can be used to improve procurement and supply chains, as can the huge amount of data they create. In some cases, this is already happening. However, the level of ambition, capabilities, and change required to get the most from the technology can be seen as more challenging over time.

Supply chain managers struggle to build an end-to-end process for preparing profitable accounting for the supply network, especially when faced with a competitive market environment on a daily basis, globalization, changing product portfolios, greater complexity, and fluctuating consumer demand. Managers may strengthen their decision-making by forecasting build-up bottlenecks, unexpected abnormalities, and solutions by incorporating artificial intelligence in the supply chain and logistics in order to streamline production scheduling that could otherwise turn out to be highly unpredictable due to reliance on manufacturing operations management. In the supply chain, AI can also help make accurate predictions and estimates of how things will change at different stages. This allows better alternatives to be scheduled.

By using cognitive forecasts and recommendations on optimal behaviour, the use of AI amplifies crucial decisions. In terms of time, cost, and revenue, it also helps producers with potential consequences across different scenarios. Along with that, as relative circumstances change, it continually learns over time and builds on those recommendations. Today, many businesses lack valuable actionable knowledge to make timely choices that meet demands with haste. Automation that harnesses the power of AI has the potential to move patterns much more efficiently than traditional systems through large amounts of dispersed information.

In logistics, AI offers real-time monitoring mechanisms to gain timely insights into where, when, and how deliveries could and should be made, such as optimum times. Moreover, such efficient multi-dimensional data analytics help to reduce unplanned downtime, maximise fuel efficiencies, identify and prevent bottlenecks, etc. It offers the intellect of managers the ability to struggle against management challenges that arise on a day-to-day basis.

Literature Review

In their paper, "Internet of Things and Supply Chain Management," Mohammed Ben Dayal, Elkafi Hassini, and Zied Bahrour(2022) have explained enough to help understand the role of the Internet of Things (IoT), artificial intelligence (AI), and its effect on supply chain management (SCM) through a comprehensive literature review. Including its description and further briefing, along with major IoT technology enablers and different SCM processes and applications, important aspects of IoT in SCM are covered. The use of digitalization and internet use, along with its other characteristics, are explained. Automation and Artificial Intelligence in Business Logistics Systems: Mathias Klumpp's(2018) Human Reactions and Collaboration Criteria focuses on a specific case study where automated truck driving in logistics is taken as an example, and a basic demonstration is compiled inside to test the idea of practical implications. The results of the findings include the notion of four distinctive and growing levels of resistance before eventually achieving a successful "trusted" partnership between human operators and systems of artificial intelligence. This is important for the design of many automated logistics systems, including in the field of autonomous driving supervision for drivers and other related transport professionals.

Blockchain technology and its relationships with sustainable supply chain management, written by Sara Saberi, Mahtab Kouhizadeh, Joseph Sarkis, and Lejia Shen(2019), is a crucial review of how Blockchains can resolve the possible obstacles in the industry. It is a highly disruptive technology that is early in its development. Four types of Blockchain technology adoption barriers are introduced: inter-organizational, intra-organizational, technological, and external. True Blockchain-led business and supply chain transformation is still in its early stages of development and involves the proposal of potential research initiatives and directions that can provide insights into overcoming obstacles and the implementation of supply chain management Blockchain technology. The "Effects of Digital Technology and Industry 4.0 on the Ripple Effect and Supply Chain Risk Analysis" study by Dmitry Ivanov, Alexandre Dolgui, and Boris Sokolov(2018) integrates the findings from

two fields, i.e., the impact of digitalization on SC management (SCM) and the impact of SCM on the regulation of the ripple effect. This may be the first study linking the perspectives of industry, information, engineering, and analytics on digitalization and SC risks. This paper does not claim to be comprehensive in nature, but rather analyses recent literature and case studies with the aid of a conceptual context for researching the relationships between threats of digitalization and SC disturbances, seeking to take the topic further. It also brings with it a SC risk analytics platform and relative knowledge.

Bruzzone, Orsoni, and Mosca's(2002) "AI-based optimization for fleet management in maritime logistics" is a research paper that highlights and clarifies the features of an automated decision support system (DSS) developed for a large chemical company to optimise maritime transport logistics. To complement the DSS, the paper focuses on the design and implementation of an optimization module. Research was carried out to understand the edge provided by using this particular AI in the field of cargo transportation through water bodies.

Methodology

The type of approach used in this research is of the descriptive type. Primary data is collected for the study and further analysis. The questionnaire was constructed and passed on to the company officials, their employees, and their clients. The calculations are carried out in order to prove the stated scope of study and to solve the problem stated above. Two hypotheses were charted out, and the calculations were carried out to determine the best alternative. The research was concentrated on the new AI that was introduced in the logistics department. There were only a handful of AI users with prior knowledge of the AI, and thus, a convenient sampling was carried out while collecting the data. The sample size was 219, and it consisted of the employees of Crofarm and their customers.

The objectives of the study are:

1. Ascertain the applicability and utility of AI in logistics and supply chain management.
2. Calculate the total output of the company's use of the specific program.

Results

From the questionnaire, the results were evaluated for 219 respondents. From the results, it was found that AI and its implementation had a positive impact on the company's working and total output. The merits brought by Locus and its major feedback provided by the respondents are depicted below in the form of bar charts.

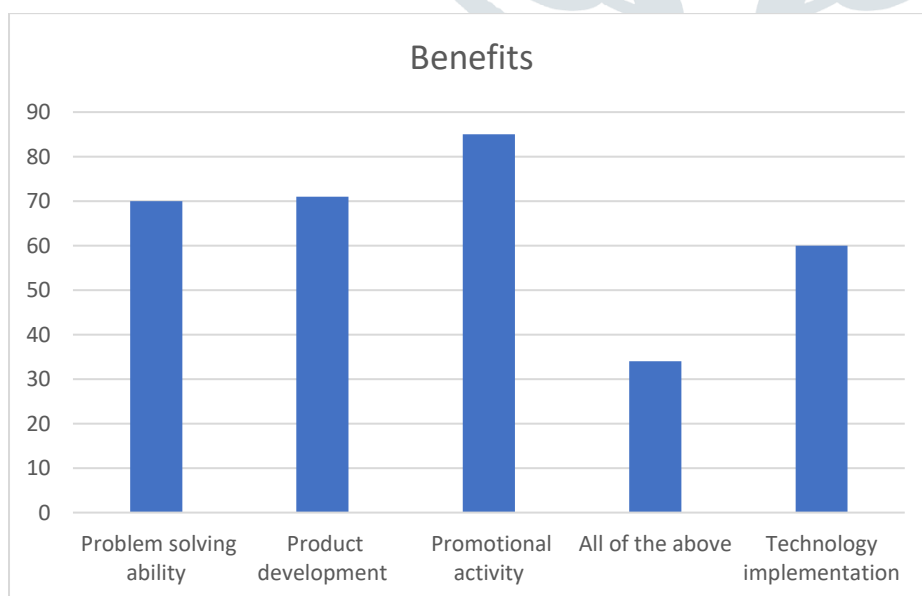


Chart :1 Benefits of AI

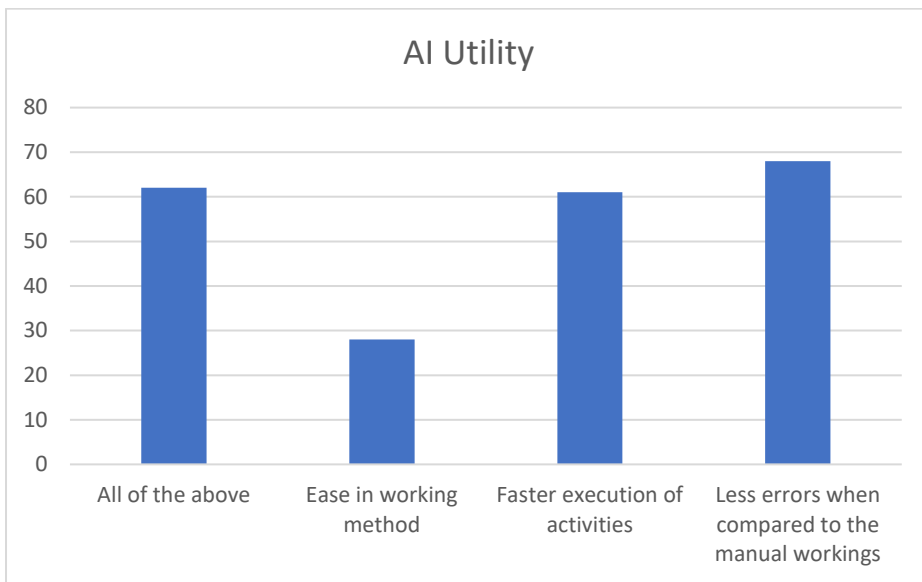
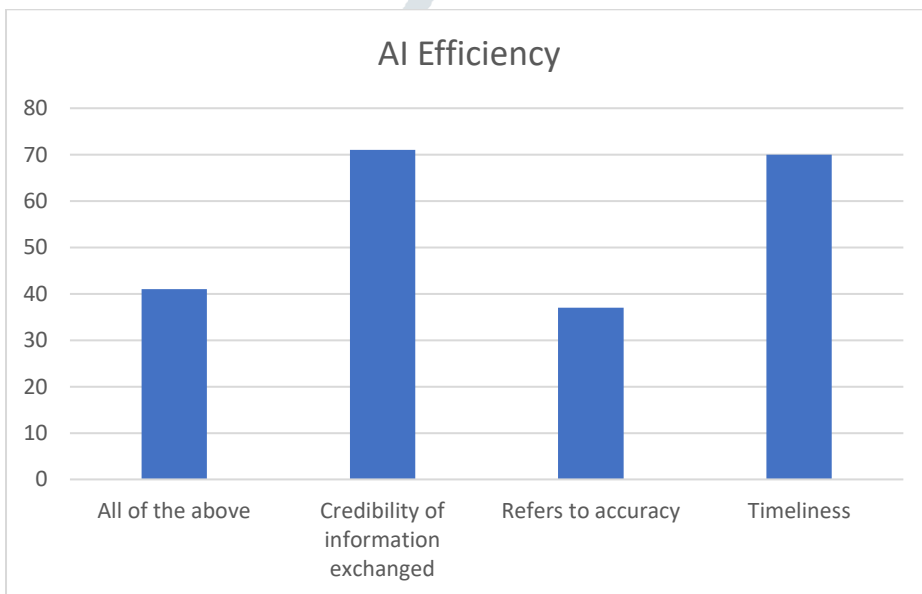


Chart 2: AI Utility



Model Summary				
Model	R	R Square	Adjusted R Square	Estimate's Standard Error
1	.064 ^a	.004	-.001	.69273

a. Predictors: (constant), AI

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.357	.130		18.197	.000
	AI	.045	.048	.064	.939	.349

a. Dependent Variable: Logistics

The significant value is .000, which is less than .05, and thus an alternative is to be chosen. Therefore, H1 is taken into account. Introduction of AI is resulted in more productivity and improvement in production efficiency.

Discussions and analysis

Based on the collected data, most of the people who answered said that the use of AI in the department led to technological progress and the ability to solve problems. The establishment of "Locus" in the firm and its cost were less when compared to manual functioning. Wastage of time, money, inefficiency, and dissatisfaction among the clients were reduced after the proper application and utilisation of the new technology. Delivery lead time and resource consumption decreased while productivity, data visualization, and other functions in the organisation were enhanced. The majority of respondents agreed that AI was credible and dependable. Accuracy and efficiency, along with the credibility of data and data processing, show the value of the total output generated by the usage of Locus. It was decided that the majority of respondents rely on AI more frequently. The use of AI generated more output and effectiveness than in the past, where manual functioning was once used. The employees of the company must be better acquainted with the basic details of AI, its mode of functioning, its cost, etc.

The introduction of Locus was considered a very revolutionary change for the business. This type of AI is common and is used in almost all developed organizations, which means that the company still has a long way to go in terms of technological advancements. The establishment and maintenance of the AI were properly carried out, and sufficient training was given to its users. But any hint of an upgrade or development in the current technology was not sensed. This must be taken into account, and the technology must be ensured to be fool-proof, secure, safe, and error-free. Locus seems to be efficient enough to bring a major change to the profit scale of the company. Crofarm developed the technology on its own. The firm should try to develop more tools like these and introduce them in each and every department.

Conclusion

We can conclude from this study that the establishment of locusts in the logistics department resulted in hugely beneficial changes for Crofarm. The application of AI for charting courses or routes, real-time tracking, statistical analysis of distance, plotting the best alternative, etc. were the main features of Locus. This helped the business cut costs in both the transportation segment and in warehousing. The respondents appeared to be slightly overly reliant on AI users and had little idea or information about the cost of establishing and maintaining the technology. But as the employees reported, it was definitely a less costly and better alternative than using a manual structure in the department. We can also conclude that implementing new technology or AI in business will almost certainly add merits and advantages to the overall operations of business organizations.

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