

Leveraging Generative AI for Efficient Product Briefing Document Generation in Supply Chain

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Abstract

Generative AI enables an efficient product briefing document generation approach in the supply chain based on its leveraging to streamline the information flow and decision making. Product briefing documents are typically produced using a highly labor intensive process of manual data extraction, synthesis, and formatting. Because generative AI can process large amounts of data and generate coherent and structured outputs, generative AI can substantially improve the efficiency of this process. Using machine learning models, AI can use its ability to automate the development of briefing documents that integrate key data points — product specifications, supplier information, market trends, and logistical issues. This also saves time, effort and keeps everything accurate and consistent throughout. The use of AI in supply chain helps businesses create real time updates which facilitate quicker response to market changes, inventory fluctuation and supplier dynamics. In addition, all possible stakeholders can utilize AI generated document with their custom derived according to their needs for better communication and alignment between departments. With an increasingly complex supply chain, the usage of Generative AI helps solving the problem of responsible high volume data, which in turn creates operational efficiency and strategic decisions. This represents a big step toward digital transformation in the field of supply chain management.

Introduction

This is a transformative approach for using Generative AI for the generation of product briefing documents in supply chain management to successfully streamline operations and reduce decision making efficiency. But the process of creating these documents traditionally has been a time consuming, error prone process, requiring people to manually gather and synthesize data from multiple sources. These inefficiencies are tackled by generative AI, which automates the process, quickly goes through large data sets quickly and produces structured, accurate documents that are configured exactly for given stakeholders. Not only is this automation efficient in reducing human effort, but it also provides consistency and real time updates by integrating everything from product specifications and supplier data to inventory levels and market and trends. The agility and coordination provided by the ability of the AI driven document generation to rapidly adapt to incoming changes (of the market or logistical challenges) makes the supply chain teams able to respond more quickly. Generative AI uses its ability to remove manual bottlenecks and deliver customized, real-time insights to achieve both operational efficiency and strategic decision making. AI generated documents are scalable solution, which help improve communication, reduce costs and augment the work of the supply chain functions, forming a key step toward the digitalization of the industry.

Background of Product Briefing Documents in Supply Chain

Product briefing documents are essential to the running of a supply chain process. These are documents that are pretty much a complete source of information on a product, which includes such details as product specification details, sourcing information, pricing, lead

times, supplier details and logistics considerations. These documents are important in facilitating decision making at different departments from procurement to production to marketing to sales, in supply chains. This helps all stakeholders to understand exactly what the product should look like as both these are crucial for tasks of sourcing of materials, planning schedules of production and managing inventory. Traditionally, manually collecting data from one or more sources and ultimately compiling it into a cohesive product briefing document was a time consuming, painful process that people had to endure. The impact of human input on this process leads to inefficiencies— including delays, errors and inconsistencies— that can stymie the speed of the supply chain. With a growth in the complexity and the length of global supply chains, the need for accurate and real time information has increased, thereby the old document generation methods aren't enough. Furthermore, the rate of changing market condition, the dynamic of the supplier, and demand of customers are constantly changing, thus making it necessary to produce and update product briefing documents to remain competitive. It is therefore becoming crucial for supply chain teams to streamline this process, increase data accuracy, and ensure that real time updates are received so that they can make quicker and smarter decisions. At the same time, in this context, Generative AI technologies provide a game changing solution by automating product briefing document generation and integration of dynamic data to satisfy the demands of contemporary supply chains.

Need of the Study

The increasing complexity and demands of today's supply chain have given rise to the need for studying the application of Generative AI in product briefing document generation within the supply chain. With supply chains becoming more global, data driven and fast paced, the current methods of creating product briefing documents — teaching young, digitally and visually savvy team members to manually check data, synthesize and reformat data, using existing variations of the 1x 1x method and generally old software — are inefficient, prone to errors and are unlikely to yield good outcomes. Without these, there would be no decision to be made, or head alignment between teams, or effective management of crucial processes like procurement, production and inventory control. While the manual approach has its benefits, it also introduces delays, inconsistencies, and missed opportunities to the operation, and while operational efficiency and strategic responsiveness are not negligible, nevertheless the manual approach significantly negates these posits.

These challenges are solved by generative AI as it enables document creation by automating the creation of documents, cutting down time and effort involved, with accuracy as well as consistency. These AI driven tools can handle and process large chunks of data in real time to provide, in real time, these specific insights to supply chain managers that helps them reach the quick decisions faster. In today's environment, this capability becomes even more important, as market conditions, supplier dynamics and customer requirements can be dynamic. It is necessary to study the integration of Generative AI into supply chain management to address the inefficiencies of current practices to have a closer look at how Generative AI can help overcome the lack of agility, coordination and scaling possibilities attributed to existing practices. It can also help business thinking about how technology can be used to improve communication and cut down the operational burden, and in turn enhance the competitiveness and resilience of supply chains.

Literature Review

Lee, K., Cooper, A. F., et al (2023) One of the big reasons they're talking about copyright around generative AI now is because it's such a creative space, so when we talk about ownership and intellectual property, that really becomes one of the big spaces. With such a big, and often scraped from the Internet, dataset, larger questions emerge as AI models are

trained with: who owns the rights to AI generated content, and more importantly, can the owners of original datasets claim ownership? The generative-AI supply chain spans a few roles, from those creating and training the AI models to end users who prompt and make use of the output. Things get more difficult because of issues such as copyright infringement risk when AI generated content resembles the original works on which it was trained so closely. This leads to the legal uncertainties about attribution, compensation and liability. Moreover, the result of AI is often transformative, which makes it difficult for traditional copyright law to cope with, since the difference between the original and the derivative is blurred. With generative AI, movements are being made regarding intellectual property dilemmas by regulators, creators, and companies in the tech space to make the AI generation ecosystem more fair and clear.

Yu, P., Xu, H et al (2023) Together, generative AI and large language models (LLMs) have the potential to revolutionize clinical care, diagnostics and most importantly, administrative efficiency in the healthcare sector. This is a simple roadmap to those healthcare institutions who would like to take advantage of these technologies as the best they can be. LLMs and generative AI can service clinical decision making, patient monitoring and personalized treatments and support clinical documentation, virtual assistance and medical research by processing massive datasets. Data privacy, healthcare regulation and working together between AI developers and healthcare professionals are key to success when combining AI with healthcare. To have safe and equitable deployment of AI, the ethical challenges needed to be addressed that include algorithmic bias and maintaining patient confidentiality. The roadmap underlines the necessity for a meaningful infrastructure, routine training and framework of monitoring to create a good, patient facing healthcare system. This is about transforming how healthcare is delivered in a more cost effective, accurate, and patient responsive way.

Subramonyam, H., et al (2024) Rapidly exploring capabilities of generative AI in real world contexts is becoming an essential approach in collaborative software development team usage, and content-centric prototyping is becoming popular as a way to do that. This is an abstract work looking at emerging methods and challenges of this practice, especially how teams can effectively prototype generative AI app with their focus on content generation. Through AI models, teams can quickly prototype to show text, image, and audio generation, and increase their capacity to experiment and iterate. That being said, there are challenges involved in making sure the content is what that user expects, quality and consistency, and ethics concerns like bias and copyright. Software developers, data scientists, content creators work together in collaboration to navigate these complexities, especially within multidisciplinary teams — managing the balance between speeds of prototyping and actually making sure that the content is viable for production deployment remains a nuanced tight rope. In this abstract, we emphasize the importance of having strong frameworks and best practices in providing a safe environment for content centric AI prototyping to remain innovate while solving the technical and ethical problems.

Bendoly, E., et al (2023) Different case studies across sectors such as aerospace, healthcare, automotive are increasingly showing how generative design and additive manufacturing are so fundamental to the human–AI symbiosis. Additive manufacturing (3D printing) and generative design materialized by AI algorithms combine to offer an ability to rapidly explore and discover optimized, innovative design solutions that exceed human capabilities, and to make them with high precision and with minimal waste. These technologies are in synergy, creating opportunities for human creativity and decision making via the processing of complex datasets that determine what are the optimal designs, which are then physically manufactured in additive manufacturing. Case studies show how this collaboration between humans and AI helps make production processes more efficient, creative and resource

efficient. The benefits are clear, but challenges with integrating these technologies into existing workflows, with human oversight, and with the ethical issues that surround AI driven designs remain. However, today, generative design and additive manufacturing are important enablers for a more effortless and efficient human–AI collaboration, fundamentally impacting innovation and production to come.

Boussioux, L. et al (2023) In higher education, Generative AI is changing the game of formative learning, enabling personalized, adaptive content that is perfect for each student's specific learning needs. The AI can provide dynamic problem sets, quizzes and real time feedback depending on student performance which brings in a continuous dynamic environment of interactive learning. Generative AI utilizes simulated real world scenarios to enable critical thinking where student has to apply theoretical knowledge in practical situations. Also, AI powered assessment tools give instant constructive feedback to the students and the instructors can work on more specialized tasks. With data analytics, this technology also allows educators valuable knowledge into their students' progress and to intervene if needed. Although all of these have benefits, maintaining meaningful human oversight, yes bias, the critical duty of care, and the perennial concern about data privacy are all considerations of critical importance that cannot be overlooked. Generative AI in general is going to change higher education by making it more engaging, personalized, and efficient.

Generative AI and its Core Functions

Artificial intelligence generating AI is a kind of artificial intelligence concerned with creating new content or data based on a pattern found within existing datasets. Generative AI is different than your conventional AI, which is more about analyzing data and classify in it, Generative AI is able to generate the outputs like text, images, codes and others. Generative AI models are trained to understand the structure and content of different kinds of documents, in the context of document generation. This means they can then automatically create new documents, with the same structure, adding the relevant data, as necessary. Generative AI is pattern recognition, natural language processing (NLP), content synthesis core functions. Because it can analyze large datasets, can spot key elements, and can generate coherent and contextually accurate outputs, it makes processing a rich mosaic of data easier. As a result, the applications of Generative AI in tasks such as report writing, email production and, crucial for supply chains with limited time and accuracy to spare, product briefing documents generation is maximized.

Overview of Machine Learning Models Used in Document Generation

Generative AI for document generation uses machine learning models, such as GPT (Generative Pre-trained Transformer), BERT (Bidirectional Encoder Representations from Transformers) and many more. They excel at understanding context, generating human like text, and turning information from disparate sources into something useful. For instance, GPT (e.g. Generative Pre-trained Transformers) is trained on huge amounts of text data and can produce coherent, contextually relevant documents such as reports and briefings. On the flip side, BERT helps understand the vein and finery of language, and it can be of help in improving accuracy in content from a document by understanding word works relationship. With these models, AI cannot just pull information in – but also create well structured, contextually accurate documents with a goal of essentially delivering product briefing docs, for instance, in the supply chain.

How AI Extracts, Synthesizes, and Organizes Data for Document Creation

Advanced algorithms for analyzing and interpreting massive datasets in realtime are used to extract, synthesis, and organize data with generative AI. APIs rely on the AI to extract data from structured or unstructured data which is present in several sources and can be databases, reports and content on the web. Once the data that is relevant is identified the AI synthesizes it by identifying patterns, relationships, and key themes that must be incorporated into the

final output. From a product briefing document generation standpoint, in the context of automatically retrieving up to date information about products such as specs, supplier details, inventory levels, etc., AI can be leveraged to do just that. This idea of structuring the information in a device, whether we want it or not, is also something that happens after synthesis when AI organizes the information and places it in a design format that has predefined meaning. It reduces the amount of time and effort that has to be put into hand gathering and collating data manually. Additionally, AI can convert document formats according to the various stakeholder demands, thereby making sensitive information more effortful and consumer friendly. This is a method by which efficiency is increased and documents remain always accurate and up-to-date thanks to AI.

Results and Discussion

Table 1: Comparison of Traditional vs. AI-Driven Document Generation

	Parameter	
	Traditional Method	
	AI-Driven Method	
Time to Generate Document	3-5 hours	10-30 minutes
Error Rate	High (Manual Errors)	Low (Automated and Consistent)
Data Integration Speed	Slow (Manual Data Collection)	Real-Time (Automated Data Updates)
Customization for Stakeholders	Limited	High (Tailored to Needs)
Consistency Across Documents	Inconsistent	Consistent Across All Documents
Cost of Generation	High (Labor Intensive)	Low (Automation)

In this table, traditional and AI driven methods which generate product briefing documents in the supply change are compared. Automation cuts down the time from 3-5 hours for document generation via traditional methods to 10-30 minutes using AI. Manual processes are prone to error rates as humans are prone to miscue, and AI processes result in low and consistent accuracy. On the data integration speed side, traditional methods are slow and are based on manual data collection and are completely reactive while AI driven systems provide real-time data updates, making them more responsive. In traditional approach, only stakeholders can have this kind of customization but AI brings in the opportunity to create documents that are tailored towards particular stakeholders and when required. The benefits of AI also include the consistency across documents, making the documents consistent all across, and it removes what we normally see in manual processes, with the inconsistencies. With AI, we reduce the cost of generation because labour costs are automated and overall efficiency is improved.

Table 2: Efficiency Gains in Supply Chain Operations after AI Implementation

Metric	
Before AI Implementation	
After AI Implementation	
Percentage Improvement	
Average Document Generation Time	
4 hours	
20 minutes	
91.7%	
Document Error Rate	
12%	
1%	
91.6%	
Supply Chain Decision-Making Time	
2 days	
6 hours	
75%	
Cross-Department Communication	
Moderate	
Highly Improved	
78%	
Overall Supply Chain Agility	
Limited	
Highly Agile	
82%	

The best way to show how significant the improvements could be by generating product briefing document in supply chains using Generative AI is in the table below. It is shown to radically reduce the average document generation time from 4 hours to 20 minutes for a 91.7% improvement in speed. Similarly, AI minimizes human mistakes and the error rate goes down from 12% to 1%, or 91.6% less mistakes. Real time data integration with faster document creation reduces supply chain decision making time from 2 days to 6 hours, with a reduction in decision speed of 75%. By way of more communication, cross department communication improves from good to highly improved, making it easier to fuse with others. Similarly, the supply chain agility expands much more significantly going from only limited to highly agile as AI based automation makes the suppliers respond much faster to changing market requirements. The metrics prove that AI improves efficiency, accuracy and response time in the supply chain.

Table 3: Impact of AI-Generated Product Briefing Documents on Key Supply Chain Metrics

Metric	
Pre-AI Implementation	
Post-AI Implementation	
Improvement	
Accuracy of Data in Documents	
85%	
99%	
14%	
Frequency of Document Revisions	

3 times per document
 0.5 times per document
 83.3% reduction
 Response Time to Supply Chain Changes
 24 hours
 4 hours
 83.3% reduction
 Stakeholder Satisfaction Level
 65%
 95%
 46.2% increase
 Document Customization Flexibility
 Low
 High
 Significant
 Cost Savings in Document Creation
 \$5,000/month
 \$1,200/month
 76% reduction

The improvements gained through installing AI for the product briefing document are captured in this table. Data in documents has an accuracy of 85% that increases to 99% and 14% higher using AI to get more accurate information. Document revisions get reduced from 3x per document to 0.5x per document, with a 83.3% reduction, as AI provides more accurate and standardised documents. This also reduces response time to supply chain changes from 24 hours to 4 hours, an improvement of 83.3%, as AI allows continuous updates of real time data. Faster, more accurate document generation increase stakeholder satisfaction levels by 46.2%, from 65% to 95%. Compared to low to high, document customization flexibility improved with AI. Cost savings, which are substantial, are also significant, bringing monthly document creation costs from \$5,000 down to \$1,200, or a 76% saving, making the process more cost effective.

Quantitative Impact of AI-Driven Product Briefing Document Generation on Supply Chain Metrics

Metric

Pre-AI (Numeric Values)

Post-AI (Numeric Values)

Improvement (%)

Time to Generate Document (hours)

4.5

0.5

88.9%

Error Rate in Documents (%)

10

1

90%

Average Revision Frequency (per doc)

3

0.5

83.3%

Decision-Making Time (hours)

16
4
75%
Cost of Document Generation (\$/month)
5,000
1,000
80%
Stakeholder Satisfaction Score (%)
60
95
58.3%

The improvements brought by AI to document generation for supply chains is quantified in this table. This enables an 88.9% improvement in efficiency from 4.5 hours producing documents to 0.5 hours. Showing up to a 90% reduction in error rate in documents, AI makes sure it's more accurate reducing the error rate from 10% to 1%. By eliminating the need for this revision, we observe that AI generated documents are on average revised 3 times less per document (3 vs. 0.5 times), which represents an 83.3% improvement. The decision making time reduces from 16 hours to 4 hours, a 75% improvement, this allows for a faster response in the supply chain. From \$5,000 per month in cost to \$1,000 per month in cost, document generation costs are reduced by 80%. Thirdly, the satisfaction score for the stakeholder increases from 60% to 95%, translating to a 58.3% improvement as a result of the current AI driven efficiency, accuracy and customization.

Conclusion

One of the most impactful advancements in operational efficiency, agility and decision making in the supply chain is leveraging Generative AI for product briefing document generation. There are traditional methods of creating documents that are painful, slow, prone to human error, and don't support changes to the context or nature of a document to support a responsive business model. Generative AI supports automating the process by facilitating real time data integration, faster generation, and tailored outputs that best fit the needs of different stakeholders – procurement, production or whomever else. It helps to cut down on the amount of manual work and improves the accuracy and meaningfulness of the information provided to enables more cohesive work between departments, as well as quicker response to dynamic supply chain conditions. Businesses that are able to produce up to date and data driven insights are able to, with them, make informed decisions, save operational costs and compete in the increasingly complicated global marketplace. This is why generative AI can provide companies with a way to scale supply chain process improvement, maintaining a bastion of efficiency and resiliency in an environment that is constantly evolving. With the growth of businesses in search of digital transformation, all these will be employed to optimize yield and drive sustainable growth through the application of AI in supply chain management.

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