GenAI Expo Winter 2025

Executive Summary – First Draft Template

Group #: 17

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Demonstrate ways businesses can leverage AI or generative AI to automate tasks, with a focus on increasing productivity, efficiency and/or value to the consumer.

Executive Summary Preview

Provide a brief (50-100-word) answer to each of the following questions.

1. Describe the business problem your project addresses and how automation plays a role.

   Answer: The objective of the project is to optimize warehouse inventory management inefficiencies that often result in stock gaps, high carrying costs, and product unavailability that threaten supply chain integrity. By implementing automation, we combine stock monitoring with artificial intelligence-based demand forecasting, reducing human error, maximizing stock turnover, and ensuring accurate safety stock quantities. In addition, automation of inventory management increases process efficiency, order fulfillment accuracy, and minimizes expenses while maintaining high service levels. Overall, this approach enables companies to meet demand without overstock or stockout issues in the warehouse.

2. Explain the specific role played by Gen AI and the associated Gen AI tools in your project.

   Answer: Generative AI was a key enabler of the project. Firstly, to analyze the historical sales data and its pattern, demand forecasting techniques are used to accurate predictions of future demand for the most sold product. Secondly, for numerous demand scenarios including holidays and seasonal trends, it simulates and provide an understanding of demand fluctuations. Followed by, calculating optimal inventory levels, reorder points, safety stock and economic order quantity (EOQ). Moreover, the project utilized a range of Generative AI tools to meet its objectives. A time series forecasting tool (Prophet) helped to model demand patterns. Used non-linear regressor (Random Forest Regressor) for feature importance to identify lead time and geographic factors. Lastly, to enrich and expand our training dataset, data augment techniques are used to improve the accuracy of forecasting model.

3. Describe the target audience/end users of your project (ex: specific industries, types of companies, customer demographics).

   Answer: Our automated inventory management system primarily targets mid to large-sized warehouses and distribution centers across multiple industries, including retail, manufacturing, and wholesale distribution. The end users include warehouse managers seeking to optimize their operations, inventory control specialists requiring accurate real-time data, and C-level executives looking to reduce operational costs. The focus of the model is for Fashion, Sports and Electronic supplies businesses handling large volumes of inventory with complex supply chain requirements, multiple SKUs, and those experiencing challenges with manual tracking systems. The solution is precisely valuable for companies with a large capital and revenue, who are looking to modernize their operations and maintain competitive advantage through improved efficiency and reduced costs.

4. Explain the specific benefits of your project and anticipate the impact on productivity, efficiency, and/or value to the consumer.

   Answer: The system brings considerable benefits to the entire organization. The primary advantage is a considerable reduction in stock control mistakes, accomplished through accurate stock leveling. With stock monitoring in place and automatic reorder points set up, one can expect a considerable reduction in stockout and overstock expenses. Business processes would be more efficient owing to transparency created by stock movement in real time, automatic capture of data, and simplification of reporting processes. In addition to that, there is also a boost in staff productivity as staff move away from time-consuming manual entry of data to more strategic and added-value work. Eventually, these gains are to lead to higher customer satisfaction, expressed in better order fulfillment and shorter delivery times, indirectly strengthening our competitive position in the marketplace.

5. What existing Gen AI products/tools are closely related to or would be considered competitors of your project? How does your project differ from, expand upon and/or leverage those existing products/tools?

   Answer: Our automated inventory management system enters a market where several established players offer AI-driven solutions. Major competitors including (Manhattan Associate' warehouse management system, Blue Yonder's intelligent fulfillment platform, and Oracle's AI-powered Fusion) Cloud Inventory Management offers predictive analytics for inventory optimization and AI forecasting capabilities.

   Nevertheless, our approach is marked by a number of distinct features. As compared to other systems that focus mainly on prediction and forecasting, our system is endowed with real-time flexibility and leverages day-to-day business processes to gain insights. We support easy integration with existing warehouse infrastructure, hence requiring incremental investments in hardware to be low. As compared to competitors that offer static one-size-fits-all options, our system leverages dynamic AI-based models that adjust to each warehouse's unique patterns and constraints, hence improving accuracy over time. In addition, we take advantage of existing tools' APIs when beneficial, mainly in terms of data integration and forecasting validation, resulting in a more integrated and stronger solution without competing in every aspect.

6. What legal or ethical concerns may arise in your project?

   Answer: There are key legal and ethical considerations that we have to take care of regarding our automated inventory management system. A system that processes sensitive business data on sales trends, vendor relations, and operational metrics brings with it a serious concern over data privacy and security. Further, we need to remain alert to data protection laws and have in place efforts to protect our information from breaches and unauthorized access.

   Within an ethical framework, fairness in relation to the workforce must also be one of the considerations that automation will demand in the ensuing future. While we are relieving or minimizing manual labor, we still need to consider the potential complaints about job replacement in a manner where our technology uplifts the worker instead of replacing them. However, there are also going to be tough decisions on the transparency of our AI algorithms in situations in which out-of-stock scenarios arise that affect business operations and customer satisfaction.

7. What is the intended format/delivery method for your team's demonstration? Please describe, considering the information below.

   Answer: The team presentation will display two main sections featuring both a Jupyter Notebook tutorial and a live dashboard review for observers. The demonstration presents real-time simulation of the forecasting model that shows its positive effects on inventory optimization. We will present a business case assessment which demonstrates both efficiency enhancements and cost reduction potential to the organization. The presentation will finish with a question-answer segment about technical solutions and strategic aspects of our proposed service.