

Inventory Management & Demand Forecasting with






Google Cloud Platform

Team 12: Trung Le, Riya Sarda, Ssu Hsien Lee, Vineeth Gorla, Wei Chun Chang



Table of Contents

- What is Inventory Management & Demand Forecasting?
- Why Business Should Use Cloud Computing?
- Compare Cloud Computing Platforms & Why Google Cloud Platform (GCP) ?
- Introduce Tools for Analysis & Steps:
 - a. Create a project on  **Google Cloud**
 - b. Connect to  **BigQuery** to get the data
 - c. Build a demand forecasting Model
 - d. Analyze the result
 - e. Build an interactive dashboard in  **Looker Studio**
- Case Demonstration



Inventory Management & Demand Forecasting

- There are usually several stages that a product goes through from purchase to sale.
- Undesirable events can occur at any stage, leading to product shortage.
- **Inventory Management** keeps companies informed of the **health of their inventories**.
- Potential issues can be immediately identified and resolved.
- Companies need to ensure adequate supply of products at all times.
- Demand for specific products vary a lot based on seasons, days of the week or other factors.
- **Just-In-Time** Inventory systems reduce costs greatly and increase efficiency.
- Accurate **demand forecasting** helps companies achieve Just-In-Time Inventory systems.

Why Business Should Use Cloud Computing?

- “ Firms adopting cloud computing technology yield **higher accounting returns** in the next year. “
“ Do firms adopting cloud computing technology exhibit higher future performance? A textual analysis approach “,
Min Zheng, Rong Huang, Xintong Wang, Xiaorong Li
- “ Cloud computing can be an effective means of **business model innovation**,
giving businesses the adaptability, speed, and knowledge
they need to remain ahead of the curve. “
“ Cloud computing enabled business model innovation “,
Bhavana Godavarthi, Nirmalajyothi Narisetty, Kalpana Gudikandhula, R. Muthukumaran, Dhiraj Kapila, J.V.N. Ramesh

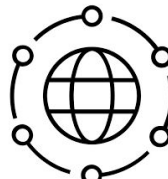
Compare Cloud Computing Platforms

	Amazon Web Services (AWS) 	Google Cloud Platform (GCP) 
Business Features	Offers more raw computing power , which focuses on managing services	Excels in big data management , processing , and machine learning analytics
Better for Who?	Businesses and developers requiring more control over their computing environment , and a large global presence and scalability	Businesses and developers who wants to focus on their application code
Disaster Recovery Management	AWS Elastic Disaster Recovery: support both on-premises and cloud DR services	Backup and DR Service: support both on-premises and cloud DR services
Gen AI & ML Model Service	<ul style="list-style-type: none"> ● Amazon Bedrock: a fully managed service for high-performing foundation models (FMs) from leading AI companies ● Amazon SageMaker: a fully managed service integrating tools for high-performance, low-cost machine learning (ML) 	<ul style="list-style-type: none"> ● Vertex AI notebooks: includes user's choice of Colab Enterprise or Workbench, integrated with BigQuery providing a single surface across all data and AI workloads ● Vertex AI Training and Prediction: reduces training time and deploys models easily with open source frameworks and optimized AI infrastructure

Unlocking GCP's Power for Inventory Mastery!



Machine Learning Capabilities



Global Infrastructure



Cost-Efficiency



Scalability and Flexibility



Integration Capabilities



Security and Compliance

Google BigQuery



Real-time Data Analytics: BigQuery enables dynamic and up-to-the-minute inventory insights through low-latency queries, ensuring real-time data analytics in our fast-paced industry.

Serverless and Fully Managed: With BigQuery's serverless and fully managed features, our focus remains on analytics, eliminating manual infrastructure management. This enhances operational efficiency and ensures high availability.

Scalable Storage and Compute: BigQuery's scalability with separate storage and compute allows flexible resource scaling. It adapts to the evolving demands of e-commerce analytics, guaranteeing optimal performance as data and computation needs grow.

Machine Learning Integration: Integration with BigQuery ML empowers our project with in-database machine learning capabilities. This elevates the sophistication of our forecasting system, contributing to enhanced accuracy and effectiveness.



Looker Studio

Intuitive Dashboard Creation: Looker Studio offers a user-friendly platform for creating interactive dashboards tailored to inventory management needs.

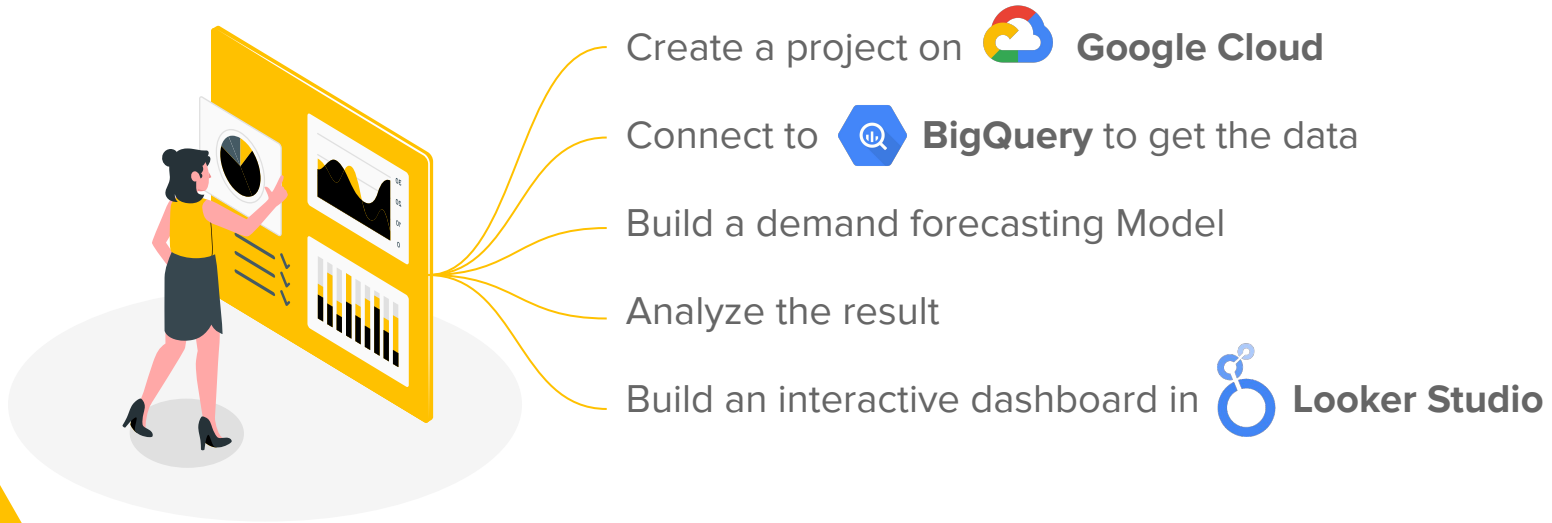
Collaborative Data Exploration: Encourage stakeholders to interact collaboratively with inventory data for actionable insights.

Customizable and Adaptable: Adapt dashboards to specific business requirements, ensuring flexibility in the e-commerce landscape.

Embedding and Sharing: Enhance accessibility by embedding dashboards into applications and sharing insights across the organization.

Scheduled Data Delivery: Ensure timely updates with Looker's scheduled data delivery, empowering decision-makers with the latest inventory trends.

Demonstration



Reference

- **Cloud computing benefits in ScienceDirect:**

- “Cloud computing enabled business model innovation”. Bhavana Godavarthi, Nirmalajyothi Narisetty, Kalpana Gudikandhula, R. Muthukumaran, Dhiraj Kapila, J.V.N. Ramesh.
<https://www.sciencedirect.com/science/article/abs/pii/S1047831023000196>
- “Do firms adopting cloud computing technology exhibit higher future performance? A textual analysis approach”. Min Zheng, Rong Huang, Xintong Wang, Xiaorong Li.
<https://www.sciencedirect.com/science/article/abs/pii/S1057521923003824>

- **AWS, GCP comparison:**

- <https://aws.amazon.com/sagemaker/> (AWS Sagemaker)
- <https://cloud.google.com/vertex-ai?hl=en> (Google vertex AI)
- <https://aws.amazon.com/disaster-recovery/> (DR)
- <https://www.guru99.com/google-cloud-vs-aws.html#:~:text=Google%20Cloud%20volume%20size%20is,cloud%2Dbased%20disaster%20recovery%20services.>
- <https://www.revelo.com/blog/google-cloud-vs-aws#:~:text=GCP%20and%20AWS%20both%20offer,control%20over%20their%20computing%20environment.>
- <https://www.digitalocean.com/resources/article/comparing-aws-azure-gcp>