# GCP

## LOOKER IMPLEMENTATION AND BEST PRACTICES

### A White Paper



Prepared by Devang Maniar

Research Paper

May 2023

# Table of Contents

1.0 Introduction to Business Intelligence (BI) ..... 4
1.1 What is Business Intelligence (BI)? ..... 4
1.2 How does BI work? ..... 4
1.2.1 What is OLAP (Online Analytical Processing)? ..... 5
1.2.2 What is Hadoop? ..... 5
1.3 What is the history behind BI? ..... 5
1.4 What are the concepts of BI? ..... 6
1.4.1 Extract Raw Data ..... 6
1.4.2 Consolidate Information ..... 6
1.4.3 Access and Analyze Data ..... 6
1.4.4 Create Dashboards and Reports ..... 6
1.5 Why is BI so important? ..... 6
1.5.1 Understand Customers ..... 7
1.5.2 Get Actionable Insights ..... 7
1.5.3 Access to Real-Time Data ..... 7
1.5.4 Provide Competitive Advantages ..... 7
1.5.5 Identify Market Trends ..... 7
1.5.6 Increase Revenue ..... 8

2.0 Introduction to Google Looker BI and Implementation ..... 8
2.1 What is Google Looker BI? ..... 8
2.2 What some popular features of Looker? ..... 8
2.2.1 Simple to Use Cloud Based Solution ..... 8
2.2.2 Integrates with other Third-party Platforms ..... 8
2.2.3 Supports various SQL Databases ..... 9
2.2.4 Tell a more Visual Story ..... 9
2.3 What is LookML? ..... 9
2.3.1 Reusability ..... 9
2.3.2 Easily Track Version Controlled ..... 9
2.3.3 Built for Complex Data ..... 10

2.3.4 Empowers Data Professionals and Non-Techs ..... 10
2.4 Why choose Looker? ..... 10
2.5 What are some other alternatives to Looker? ..... 10
2.6 What are some Best Practices? ..... 11
2.6.1 Provide users with meaning field names ..... 11
2.6.2 Group similar fields together for easier navigation ..... 11
2.6.3 Expose only what is needed ..... 11
2.6.4 Add descriptions to Fields ..... 11
2.6.5 Build workflows into Looker ..... 11

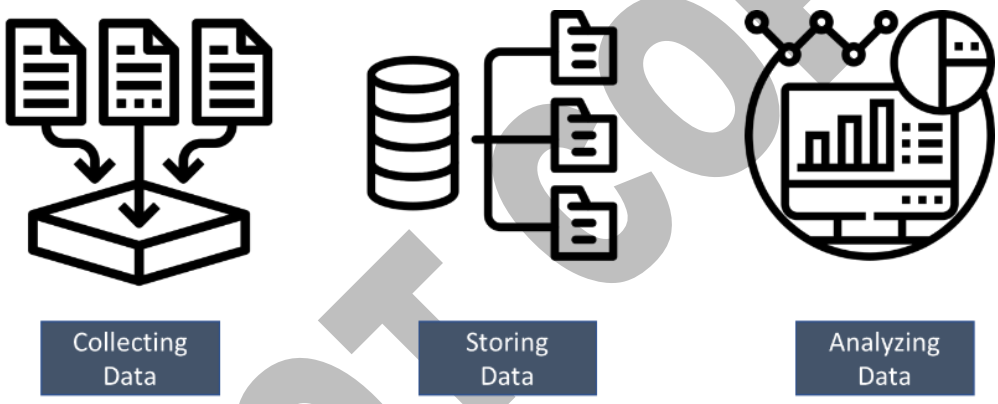
3.0 Conclusion ..... 12

4.0 Reference Links ..... 12-13

# 1.0 Introduction to Business Intelligence (BI)?

## 1.1 What is Business Intelligence (BI)?

BI in simpler terms takes business data and presents it in user-friendly views such as reports, dashboards, charts, and graphs. It is a technology that converts raw data into meaningful information to ultimately optimize performance and drive business decisions. BI covers the process of collecting data, storing data, and analyzing data into that meaningful information.




## 1.2 How does BI Work?

BI relies on data warehouses for their baseline information. It uses facts-based data and historical data for predictions, analyze market trend, understand your customers, and help with business strategy. A data warehouse aggregates data from multiple sources into one central system. Once the data is collected, it can then support analytics and reporting using queries. It can further provide results to the user in the form of reports, graphs, charts, and maps. Within BI, there are different technologies that can facilitate and analyze data such as OLAP (online analytical processing) or Hadoop. However, regardless of technology, BI will still require a data warehouse to work with.

### 1.2.1 What is OLAP (Online Analytical Processing)?

Online Analytical Processing (OLAP) is a technology support multi-dimensional queries for complex and predictive analytics. It is a type of method that enables users to easily and selectively extract and query data in order to analyze it from different points of view. OLAP provides trends analysis, financial reporting, sales forecasting, budgeting and other planning purposes. For example, a user can request a data to be analyzed to display on a spreadsheet showing company's sales for a specific month in each state, compare revenue figures to a different month, and see a comparison of sales from other states in the same time period.

### 1.2.2 What is Hadoop?

Hadoop is also another technology supporting big data and analytics for BI. It is designed to process terabytes and even petabytes of unstructured and structured data. It breaks large workloads into smaller data blocks for faster processing. It is also an open-source software making it inexpensive for companies to use hence it is also widely adopted. For example, Hadoop can provide suggestions when a customer tries to buy a mobile phone, then it suggests a customer for the phone back cover and screen guard. Based on these suggestions, retailers can make the best decision which helps them to improve their business and maximize their profits.

## 1.3 What is the history behind BI?

One can argue that the history of BI predates the digital era before computers and databases were introduced. But the first set of true BI vendors were formed in the 1970s such as IBM, SAP, and Siebel. These companies were among the first to develop a comprehensive BI system. Applications such as Crystal Reports became essential for any manager looking for insightful business strategies. Eventually in the early 2000's,

more companies started concentrating BI such as Microsoft, IBM, SAP, and Oracle. By 2010, cloud technologies and internet-based software came to life for real-time data analytics and improved visualizations. In the current era of social media such as Facebook and Twitter, whole new variety of big data was introduced. Hence, rea-time data streaming emerged and data warehouses and BI Tools are now utilized in every industry sectors.

## 1.4 What are the concepts of BI?

There are basically four concepts behind Business Intelligence:

### 1.4.1 Extract Raw Data

Organizations carry data in various systems, and so the first component of BI solution is to gather this data from different sources including CRM, ERP, flat files and more.

### 1.4.2 Consolidate Information

Once data is collected, it is then cleansed and stored into a data warehouse for faster processing and analyzing.

### 1.4.3 Access and Analyze Data

BI solution here will access the data, interpret it for trends and patterns, and present it intuitively.

### 1.4.4 Create Dashboards and Reports

Dashboards and reports can be created to share findings and discoveries for businesses to drive their decisions.

## 1.5 Why is BI so important?

Businesses are moving at lighting speed to stay competitive. Obtaining an edge over competitors requires leveraging data to make critical decisions. Businesses have huge amounts of data they can use to their advantage. BI plays a vital role in taming this unstructured big data and visually presenting it in the form

of insights and charts. BI also helps boost productivity and ensure effective decision making.

### 1.5.1 Understand Customers

BI can gauge your customers by analyzing their buying patterns and create a personalized profiles to help develop better products and rich experiences for their users. For example, BI can provide companies feedback on what products their customers buy, when they buy, which channels they use to purchase and how often they buy.

### 1.5.2 Get Actionable Insights

With enormous collection of data, companies require valuable insights to make better decisions. BI provides metrics on customers that can help companies take necessary actions enable customer loyalty.

### 1.5.3 Access to Real-Time Data

BI provides access to real-time information for companies so it reduces the risk of potential errors while preparing critical reports. It addresses short-term market fluctuations.

### 1.5.4 Provides Competitive Advantages

BI allows you to understand what your competitors are up to, their strategies, approaches and more. It helps companies always stay ahead of the game.

### 1.5.5 Identify Market Trends

Some organizations rely on leveraging external market data to detect sales trends and target regions that qualify for huge profit margins. BI provides valuable insights into customer preference and pain points through user comments and feedback.

#### 1.5.6 Increase Revenue

Identify sales weakness, get customer feedback, analyze competitors, and improve operations with the help of BI to boost revenue.

## 2.0 Introduction to Google Looker BI and Implementation

### 2.1 What is Google Looker BI?

Looker is a cloud-based BI tool that helps you explore, share, and visualize data that drive better business decisions. Looker is a platform that allows you to create and share reports fast and smart. It allows anyone in your business to analyze and find insights into your datasets quickly. Looker makes it incredibly easy to build a data exploration platform that makes your data accessible in a meaningful, intuitive way for your entire organization.

Unlike other traditional BI Tools, Looker is on cloud which bring everything into your browsers avoiding any custom downloads. It also provides security settings to access your data. Looker was originally founded in 2012, and was later acquired by Google in 2019. It now forms a part of Google Cloud and powers part of Google's Data Studio platform.

### 2.2 What are some popular features of Looker?

#### 2.2.1 Simple to Use Cloud Based Solution

Looker is easy to deploy and you do not require to download any desktop software as it is browser based. Since all your data is stored in cloud, organizations can create and manage their own permissions and security a lot easier and safer. With Looker, you don't have to write any code.

#### *2.2.2* Integrates with other Third-party Platforms

Looker has a very vast third-party ecosystem that you can use to extend it beyond just being a visualization

software. It integrates with other major platforms and tools such as Salesforce, Confluence, Powerpoint, AWS, Azure, and on-premise databases.

#### 2.2.3 Supports various SQL Databases

Looker can connect to several RDBMS systems, and not just cloud data warehouses. It can connect with Microsoft SQL Server, Azure SQL Database, MySQL, Redshift, Oracle, PostGres, and BigQuery

#### 2.2.4 Tell a more Visual Story

Looker allows to create easy-to-read reports and beautiful dashboards that helps users in exploring various patters in data. Using Looker, you can easily share rich visualizations anytime from any device.

### 2.3 What is LookML (Modeling Language)?

LookML is a modeling language for describing dimensions, aggregates, calculations, and data relationships in a SQL Database. Google Looker uses a model written in LookML to construct SQL queries to extract data against a particular database. A LookML project is a collection of dashboard, model, and view files. They are version controlled via a Git repository. LookML carries several benefits and below are few:

#### 2.3.1 Reusability

Majority of times you extract raw data, prepare it, deliver an analysis, and then never use any of that work again. With LookML, once you define a dimension, you build on it, rather than rewriting it again.

#### 2.3.2 Easily Track Version Controlled

Doing data well requires tracking what was changed and when, by whom and why. LookML provides version control using Git repository.

#### 2.3.3 Built for Complex Data

LookML captures complexity in a way other tools do not. It supports multi-level aggregation and fosters collaboration.

#### 2.3.4 Empowers Data Professionals and Non-Techs

LookML makes the knowledge of data available to everyone. Data Analysts and Developers can also empower non-technical users to build dashboards and complex metrics.

### 2.4 Why choose Looker?

Looker is considered one of the best analytics platforms on the market by its users. Its data visualization capabilities are easy for non-technical users who need real-time access to data that would otherwise require them to write SQL queries to pull. It is a self-service analytics tool that is cloud friendly so its accessible to anyone. It is highly customizable as developers can build and deploy their own custom end-to-end applications.

### 2.5 What are some of the other alternatives to Looker?

Though Looker is one popular choice for companies but its not always the right choice for every company. Below are some alternatives to Google Looker:

a) Microsoft Power BI
b) Tableau
c) Trevor.io
d) Sisense
e) Holistics
f) Metbase
g) Qlik Sense
h) Redash
i) SAP BusinessObjects BI Suite
j) MicroStrategy
k) IBM Cognos Analytics

## 2.6 What are some best practices?

There are certain best practices that Looker recommends when it is shared by a cross-functional team of users.

### 2.6.1 Provide users with meaning field names

Use label parameter to apply user-friendly names. For example, change "Count of Inventory" to "Number of Inventory Items." Avoid exposing multiple fields with the same name.

### 2.6.2 Group similar fields together for easier navigation

Use the group_label parameter to consolidate dimensions and measures from individual or multiple joined views that are related.

### 2.6.3 Expose only what is needed

By rolling out in small modules with Looker, it avoids too much exposure to users. You can expose the most important fields first and then continue to build in more functionality as business users become more confident with data exploration.

### 2.6.4 Add descriptions to Fields

Use description parameter on dimensions and measures to provide additional information to users about the logic or calculations that are used within the model.

### 2.6.5 Build workflows into Looker

Set up links that enable users to easily navigate and pass filters to other Looker dashboards or to systems or platforms that are external to Looker.

## 3.0 Conclusion

Looker is an innovative BI product with its unique approach to data modeling. It is great for experienced data teams that have complex data modeling needs and appreciate maintainability and reusability. It is built for enterprises that want to have centralized source of data, create advanced data models, and deploy machine learning models. Looker can also be used as a customer data platform (CDP) where you create a complete profile of your customers. It offers business intelligence to non-technical users through beautiful data visualizations and the ability to connect to other popular Google services.

BI Software like Looker connects people with information when and where they need it, and provides capabilities beyond spreadsheets to deliver a true picture of the business. Organizations start small with BI implementations by creating periodic reports. And then over time, organizations can move from using data to making predictive decisions. Looker helps organizations make smarter decisions, streamline their data, and focus on the customer. You can have all the data in the world but it does not mean anything if you do not understand it.

## 4.0 References

"Get Started for free." Google Cloud, https://cloud.google.com/looker. Accessed May 12, 2023.

Tech, Google Looker. "Looker Demo Video" YouTube, https://www.youtube.com/watch?v=FBlyD2nCJds&pp=ygUNZ29vZ2xlIGxvb2tlcg%3D%3D. Accessed May 30, 2023.

Gayathri. "Looker Tutorial." https://hkrtrainings.com/looker-tutorial. Accessed May 30, 2023.

"Looker & Google Cloud" Google Cloud, https://www.looker.com/google-cloud. Accessed May 30, 2023.

Tech, IBM. "What is Business Intelligence?" https://www.ibm.com/topics/business-intelligence. Accessed May 30, 2023.

Doherty, Shanna. "The Basics of Google Looker Studio https://www.bespoke-digital.co.uk/guides/google-looker-studio. Accessed May 30, 2023.

Bello, Juan. "How to Design the Best Marketing Reports on Looker Studio." https://portermetrics.com/en/tutorial/best-marketing-reports/. Accessed May 30, 2023.

FineReport. "Business Intelligence Platform: How To Choose the Suitable One?" https://www.finereport.com/en/bi-tools/business-intelligence-platform.html. Accessed May 30, 2023.