Tech Saksham

Case Study Report

Data Analytics with Power BI

“Real – Time Analysis of Bank Customers”

“College name “

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**Introduction**

Power BI is popular business analytics service from Microsoft . It helps user to create report , visualization , and dashboard from various data sources . power BI can be create accessed as a fully managed cloud services or a desktop application .

Microsoft also provides a stripped – down version of the power BI could as a power BI report server for the user who are keen on having a web version deployed on premise. With more and more business choosing cloud over on-premise setups ,power BI cloud has now become a hot favorite among business analysts. It’s ability to integrate seamlessly with the active directory authentication and Azure servicesmakes it a good fit for companies who are already in the Microsoft stack.

**Pre-Requisites**

* A Power BI account.
* Basic understanding of Python and REST APIs.
* Basic understanding of Real-Time data.

**Need to Implement Power BI Real-Time Streaming**

Power BI is primarily a decision-making tool that helps to extract valuable insights from the data. In the new age of analytics-driven decision-making, the one who has the latest data typically wins the market. There are also specific IOT-based requirements where Real-Time data has to be analyzed. In all these cases, Power BI’s Real Time data Streaming capability is a boon for organizations.

**Understanding Power BI Real-Time Streaming**

Power BI facilitates Real Time Streaming using the following mechanism:

* [Streaming Datasets](https://hevodata.com/learn/power-bi-real-time-streaming-2-easy-methods/#streaming)
* [Push Datasets](https://hevodata.com/learn/power-bi-real-time-streaming-2-easy-methods/#push)
* [PubNub Datasets](https://hevodata.com/learn/power-bi-real-time-streaming-2-easy-methods/#pubnub)

**1) Streaming Datasets**

Streaming Datasets allows external data sources to Push data to Power BI through REST APIs. They help you process the Real-Time data as and when it comes in. Streaming Datasets do not store the data anywhere and hence are not suitable for cases where historical data analysis is required. They support data retrieval for up to an hour. They can ingest up to 5 requests per second with a maximum payload of 15KB. A caveat is that you can not build reports using a pure Streaming Dataset.

### 2) Push Datasets

Push Datasets are similar to Streaming Datasets except for the fact that they can store data for historical analysis. This ability to store data also helps them to report on the data. They can ingest up to 1 request per second with a maximum payload of 16MB.

### 3) PubNub Datasets

PubNub provides an SDK based on which you can implement Real Time communication platforms. Since this is a separate infrastructure as a service product, Power BI does not ingest any data and only displays the data by accessing the streams. PubNub will allow users to work around the throughput and request data size limits imposed by Power BI.

**2.1 Services Used**

* Data collection and storage services : Banks need to collect and store customer data in real-time . this could be achieved through services like Azure Data factory, Azure event hubs, or AWS kinesis for real-time data collection, and Azure SQL data base or AWS RDS for data storage .
* Data processing services :Services like Azure stream analytics or AWS kinesis data analytics can be used to process the real-time data .
* Machine learning services : Azure machine learning or AWS sage maker can be used to built predictive models based on historical data .

**2.2. Tools and software used.**

TOOLS:

* Power BI: The main tool for this project is power BI, which will be used to create interactive dashboard for real-time data visualization.

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* Power Query: This is a data connection technology that enables you to discover , connect, combine , and refine data across a wide variety of sources.

SOFTWARE REQUIREMENT:

* Power BI Desktop: This is a windows application that you can use to create report and publish them to Power BI .
* Power BI Service: This is an online SaaS (Software as a Service) Service that you use to publish report, create new dashboards , and share insights .
* Power BI Mobile : This is a mobile application that you can use to access your report and dashboard on the go.

**3.1 .HIGH – LEVEL ARCHITECTURE FOR THE PROJECT :**

1. **Data Collection** : Real-time customer data is collected from various sources like bank transaction , customer interaction , etc . This could be achieved using services like Azure events hubs or AWS kinesis .
2. **Data Storage**: The collected data is stored in a database for processing .Azure SQL database or AWS RDS can be used for this purpose .
3. **Data Processing** : The stored data is real-time using services like Azure stream analytics or AWS kinesis data analytics .
4. **Machine Learning** :Predictive models are built based on processed data using Azure machine learning or AWS sage marker .These models can help in predicting customer behaviour , detecting fraud , etc.
5. **Data Visualization** : The processed data and the result from the predictive models is visualized in real-time using BI. Power BI allows you to create interactive dashboard that can provide valuable insights into the data .
6. **Data Access** : The dashboards created in power BI can be accessed through power BI desktop , power BI service (online) , and power BI mobile .

This architecture provides a comprehensive solution for real-time analysis of bank customers. However , it’s important to note the specific architecture may vary depending on the bank’s existing infrastructure , specifics requirements , and budget .It’s also important to ensure that all tools all services comply with relevant data privacy and security regulations .

DASHBOARD

