

Power BI KPI Reports Project

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Power BI KPI Reports Project

Practice School-2

Submitted in partial fulfilment of the requirements

for the degree of

Bachelor of Technology in Computer Science Engineering

By:

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May 2022

CERTIFICATE

This is to certify that the Practice School-2 project work entitled “**Power BI KPI Reports Project**” submitted by **Aayush Sharma (2018BtechCSE101)** towards the partial fulfillment of the requirements for the degree of **Bachelor of Technology in Computer Science & Engineering** of JK Lakshmipat University Jaipur is the record of work carried out by them under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for Practice School-II examination.


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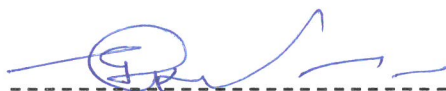
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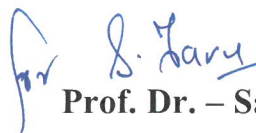
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Aayush Sharma

Sincerely yours,

Aayush Sharma

(2018BTECHCSE101)

ABSTRACT

In any industry, Analysis of the data is given big importance in their developing business strategy and development process. Analytics not only helps us to analyze the facts but also boosts the decision-making of any business. Data Analysts use data analytics techniques and powerful business intelligence tools in their research, and businesses also use it to inform their decisions.

Data analysis can help companies better understand their customers, evaluate their organization's functioning, personalize content, and create product development strategies. In the following report, I have explained how I approached and solved the given problem statement. I have also mentioned all the state-of-the-art technologies/frameworks that were used in the project.

The data provided by the client is totally based on consumers, product development, and other business-related fields. This makes data very challenging to work with as they are huge in terms of both features and records for making powerful business reports.

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CHAPTER 1: INTRODUCTION

1.1 About Celebal Technologies



Celebal Technologies is a premier software services company in the field of Data Science, Big Data, and Enterprise Cloud. We help you achieve a competitive advantage with intelligent data solutions, built using cutting-edge technology. Our core offerings are around Cloud Innovation, Supply Chain Analytics, Chat Bots, Power Platforms, and Data Analytics. Our solutions can help you accelerate decision-making and take giants leaps in your digital transformation journeys.

Celebal Technologies solutions are powered by Robotics, Artificial Intelligence and Machine Learning algorithms which offer improved business efficiency in the interconnected world. Companies clients are Product ISVs and delivery organisations across the globe who use our niche expertise in product development as well as Enterprise project implementations. We have adopted the highest standards of service quality and operational excellence, enabling its clients across a widerange of industries to transform into a data-driven enterprise. Our tailor-made solutions help enterprises maximise productivity, improve speed and accuracy.

Our adept team industry experts have strong expertise in various industry-standard technologies along with niche emerging areas including Blockchain, Analytics & Visualization, IoT, Chatbot, Data Science- AI & ML. We have hands-on experience in developing and performing supply chainanalytics and media greenlighting solutions, connect the dots across data pits for generating actionable insights. We help modernize legacy and on-premise applications by leveraging moderncloud paradigms such as Microservices, Advance Analytics, API Management, and other Cloud- native services.

With Celebal Technologies, who understands the core value of modern analytics over the enterprise, we help the business in improving business intelligence and more data-driven in architecting solutions. Our analytics team caters to ad-hoc and defined business analytics.

Website	http://celebaltech.com/
Phone	0141-4700659

Industry	Information Technology & Services
Company size	201-500 employees
Headquarters	Jaipur, Rajasthan
Type	Privately Held
Founded	2015
Specialties	Machine Learning, Artificial Intelligence, Big Data, Azure, Business Intelligence, Microsoft Dynamics 365, CRM, Power BI, InternetOfThings, ChatBot, EnterpriseBots, MicrosoftTeams, DeepLearning, NLP, Transformers, Supply Chain

CHAPTER 2: Power BI KPI Reports Project

2.1 Introduction

KPIs are the flags to measure the outcomes of the corporate strategy. These KPIs are developed for the various fields like the service contract, performance management, etc. 4 main KPIs are Financial, Customer, Process, and People. The analysis of the data is a crucial task. Corporate technologies changes with time which leads to making time to time changes in the data management strategies of corporates.

With the present solutions, it is possible for IT companies to develop meaningful data management strategies for their clients. A platform like azure cloud storage provides IT industries to load client data od different formats and provides many features to develop the solutions according to the client's needs.

We believe analysis of the client in with effective strategies helps the organization to make the decisions more effectively. This will help to reach the client's goal faster and the client can also up to date with the live market environment. With the help of Power BI, the client can get effectively analyze the data.

2.2 Background of the Project

The client had a use case for the data management and predictive analysis problem. They have data stored in multiple storage in different formats.

They want to collect all the data from different storage and with the help of this data, they want to extract some useful insights which could help to grow their business and take a better decisions. Client looking for a suitable solution for predictive analysis to enhance their system capabilities.

2.3 Objective of the Project

Design and develop an Power BI based Data Analytics and Visulization platform reports for the client analysis needs.

2.4 Scope of the Project

- Data source applications to be part of this project – SAP S/4 HANA, already existing Data Warehouse and Flat Files.
- 80-85% is already present in DW and 15-20% is to be extracted from SAP S/4 HANA to DW via Azure Data Factory.
- 3 Dashboards in total will be created that are named as Receivable Dashboard, Supply Chain Dashboard and Audit Dashboard consisting of approx. 40+ KPIs.

- The main objective is to figure out how the business performance could be shown, to figure out the potential issues, to showcase the information on daily basis and to show the data in visualized form.
- Data Modeling on Power BI.
- Data (Row Level) Security

2.5 Project Plans:

- Business logic and KPI definitions are owned by the client business team.
- All responsible users shall give sign off on visualisation layer formats before Celebal Tech team creates the same.
- Weekly progress reports shall be provided to the client on every Friday.
- Business Team feedback turnaround time is 2-3 days for each piece/report.
- Any more time taken may have implications on total project timelines.
- Maximum 2 iterations of changes as per feedback shall be taken up by the business team. Any more time and it has direct impact on Dashboard timeline.
- Total project time will be as per the Gantt chart shared in Timeline's slide. In case of any delay from the client side for pre-requisites related to requirement gathering, data modelling, data access, Azure access, all kind of business query response, feedback response, UAT sign-off, business availability for testing reports and vendor payment, will attract additional charge at requisite rate.

2.6 Technical Architecture of the Project

The architecture of the project can be explained as follows:

1. The Client Data which includes organization financial data, production data, revenue data, etc are collected from the client and uploaded to the Azure Data Factory.
2. The data from the ADF and integration will take place
3. The data from blob will be used further for the different tasks.
4. After data integration, ADF will connect with the SSMS for developing queries.
5. By making the store procedure of incremental load, data will be upload on developer side for creating views.
6. After creating views, SSIS will be integrated with the Power BI for creating the reports.

The Fig1 represent the propose architecture for the project according to the client requirements. The whole architecture divided into 4 different sections as shown in the figure named as source, Data ingestion, EDW and Reporting.

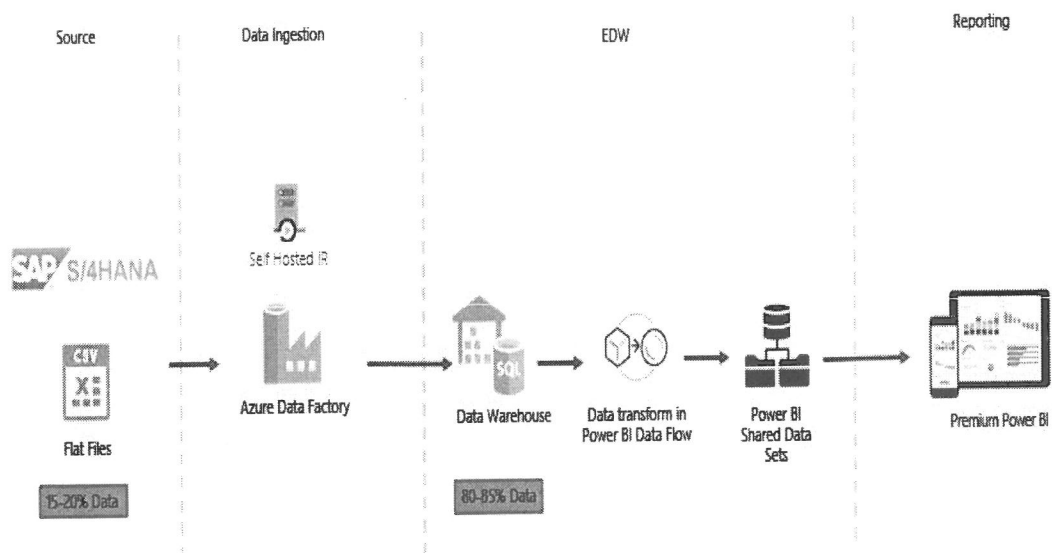


Fig 1: Project architecture

CHAPTER 3: Implementation of the project

3.1 Loading Data from the client side

According to the project architecture, client data store in the 4 different storage places. Firstly we have to import the client data from all these source and upload on the Azure Data Factory (ADF).

For the backup purpose we take client data to the Azure Data Lake Storage (ADLS). Keeping data in the ADLS will provide you the backup incase if client data get corrupt during integration or delete from the development side. We are importing the client data from the 4 data sources name as below in the Fig 2:

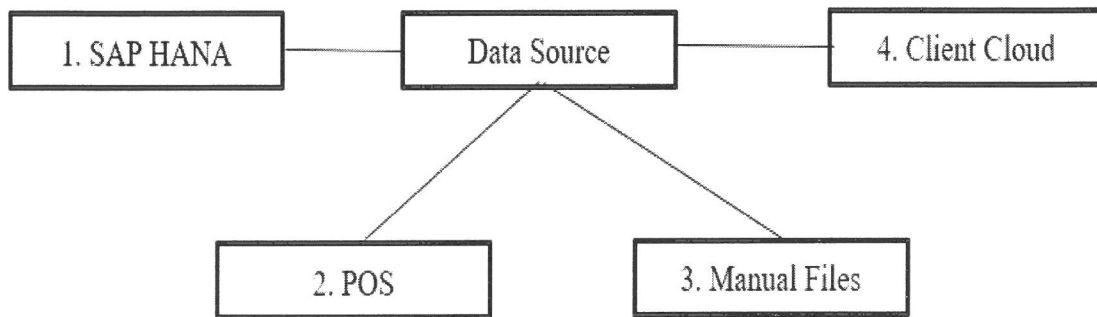


Fig 2: Client Data Sources

- **SAP HANA**

SAP HANA is a database management system developed by the SAP. Client store his data in the SAP HANA cloud database management system. SAP HANA handle transactions and analytics in a efficient manner because it stores data in memory and bringing online analytical processing (OLAP) and online transactional processing (OLTP) together.

- **POS**

POS stands for “Point Of Sale”, POS is responsible for handling and maintaining the transactional data.

- **Manual Files**

Manual files are the files which contain the client internal data related to different business fields.

- **Client cloud**

Client cloud represent the data store on the client data store on the different cloud storages. Client stored stream data related to the transactions, production movement etc.

3.2 Data Intigration in ADF

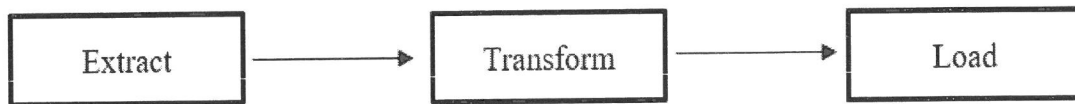


Fig 3: ETL stages

Azure Data Factory (ADF) is azure cloud ETL service for data integration and data transformation. The ETL process divided into 3 stages as shown in the Fig 3 given above. For this project we are doing ETL to analye the client data. These ETL process contain also some steps to successfully load the client data for generating the client reports.

The data we got from the client side is not the structured but data is the combination of the structured, unstructured and streaming data. To do the ETL we follow the steps from connecting data sources to data migration.

3.2.1 Connect and collect

At this stage, we have the different types of data from the client-side. The client gets the data related to the different business fields like production, invoices, revenue, product tracker, etc. All this data is stored in a structured, unstructured, and semi-structured way. The speed of the data getting to the client also varies.

The client uses more than one cloud platform for storing data on the basis of the business requirement. The rate of uploading the data also depends upon the client's use and the necessity of that particular data of the respected field.

To handle this problem we have created an information production system that connects to all the required sources of data. For centralized data processing, we have used the ADF.

For moving data we are using the copy activity in a data pipeline to move data from one place to another, this includes one premise to another or from cloud storage to other.

3.2.2 Transform and enrich

Importing the data in teh centralized data store in the cloud, Data is going to be process and transform according to the project requirement by using the ADF mapping data flows.

Data flows is the feature of the ADF to iterate the graphical data int the pipelines.

Data flows allows you to develop and maintains the data trasnformation without the support of the spark..

3.2.3 CI/CD and publish

CI/CD support for the pipelines in Azure DevOps. Azure DevOps is a Microsoft service that provides different services like version controls, reporting, etc.

This helps us to incrementally develop and deliver the ETL processes. After refining the client's side raw data for the development..

3.2.4 Monitor

After developing the data integration pipeline for the development process from the refined data. The monitor will schedule the activities and pipelines for determining the failure and success rate.

This is because during the migration process if the pipeline faces any error then troubleshooting the problem is important. data migration a crucial task and it is important to run the state in healthy manner.

3.3 Data Migration

In Azure, we are using the special fabric layer for the specialized operating system. Mapping Data flow in ADF help to perform the task without any prior coding. We have designed the data transforming job for performing the task according to the development requirements.

New data factory

* Name ⓘ

Name

* Subscription

Microsoft Azure Internal Consumption (b2c) ▼

* Resource Group ⓘ

☒ Create new ☐ Use existing

Version ⓘ

V2 ▼

* Location ⓘ

East US ▼

Fig 4: New Data Factory dialog box

Fig 2 represents the new Data Factory dialog box, here we have different options to select according to our requirement in the project.

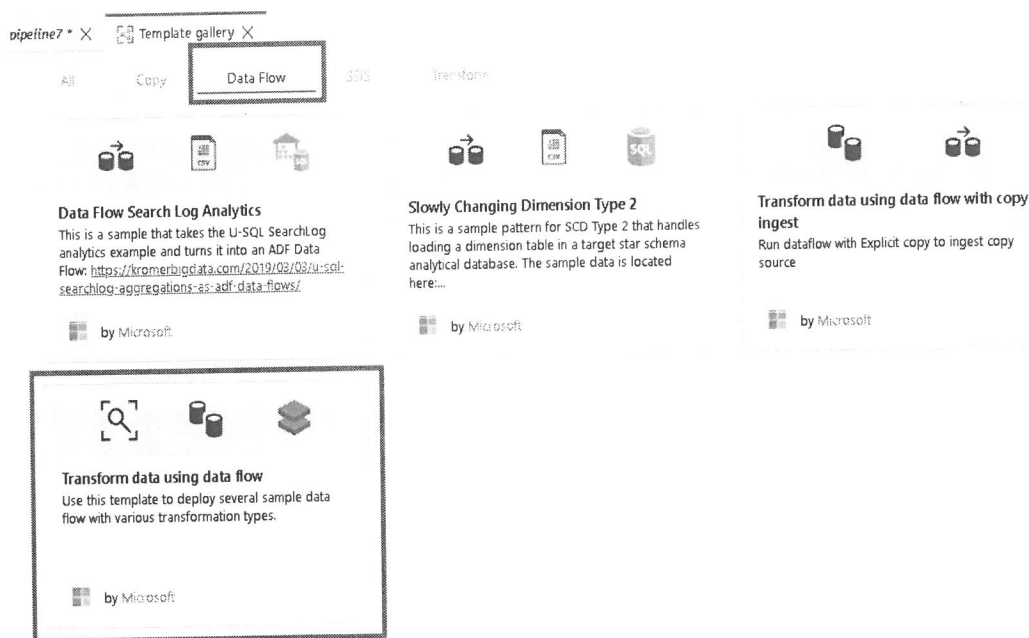


Fig 5: Template Gallery

Now we have to setup our azure blob storage account for the storing the unstructured data.

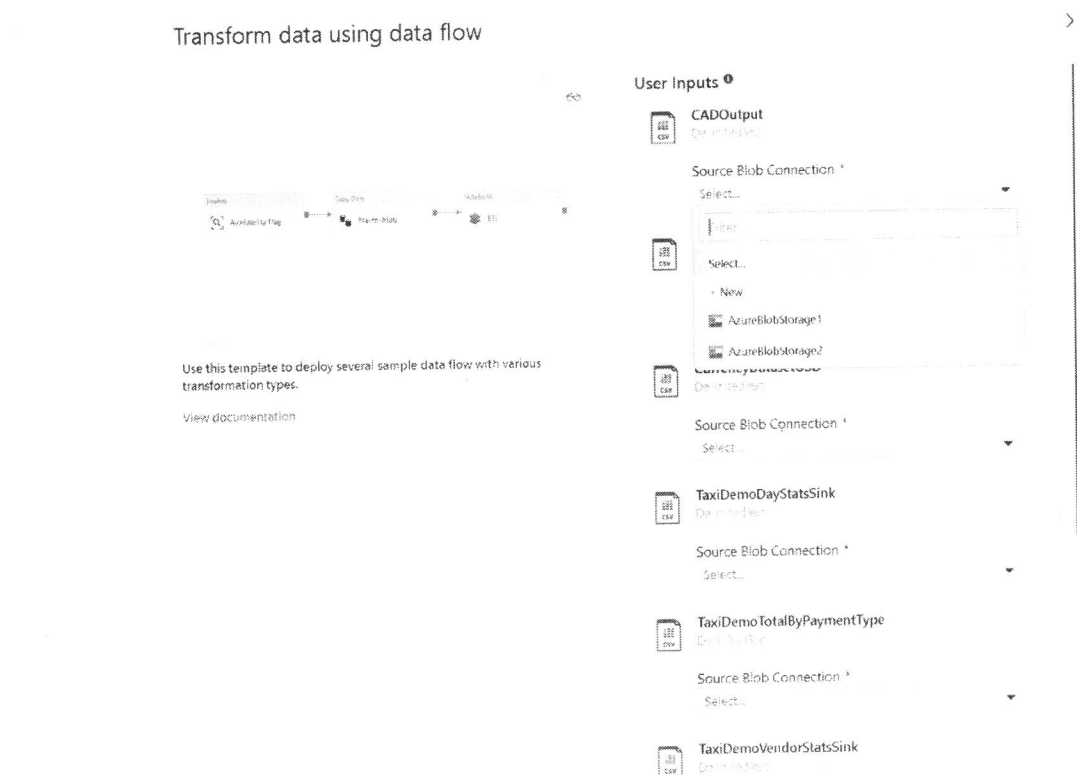


Fig 6: Transforming Data flow.

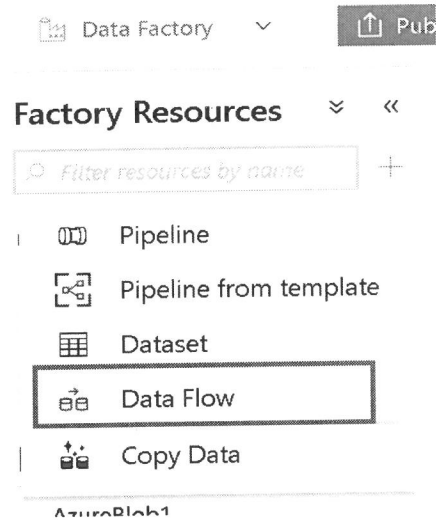


Fig 7: Data Factory Resources

3.4 Enterprise Data Warehouse

An enterprise data warehouse (EDW) is a relational data warehouse, Here we import the client's business data, including information about its customers, product, and revenue after the data migration process. At this stage, we enable data analytics, which can inform actionable insights.

At this stage, data is already imported from all the data sources, now the edw is the centralized data storage which hold and provide platform for analytics. For this project client data is first send to the staging storage, staging area is a palce where data send for the futher analytics. It is lie between the data source stage and data target stage as shown in the below figure.

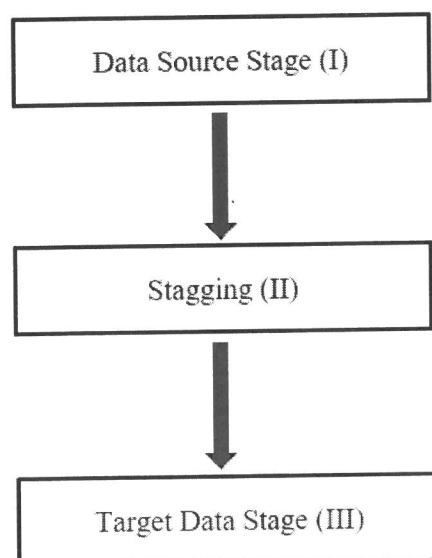


Fig 8: Data Stagging

After loading the data in staging, with the help of the store procedure we query and analyze the data for making the Power BI reports. EDW stages for the client project

- A EDW stages for this project consists of:
- Data sources from 4 data storage of client. We are using the copy activity to analyze the data.
- A staging area for data aggregation and cleaning
- A presentation or access space where data is made accessible for analytics (querying, reporting) and sharing. We are using SQL Server management studio for querying and reporting the data.
- Integration with the Power BI to managing the reports.

3.4.1 Copy Activity

In ADF, with the help of the copy activity we copy the data from one data storage to another data storage located on the on-premises and in the cloud. Copy activity runs during the integration time and need to be connected with the source and sink data store.

To copy data from a source to a sink, the service that runs the Copy activity performed these steps:

1. Reads data from a source data storage.
2. Performs serialization/deserialization, compression/decompression, column mapping.
3. It performs these operations based on the configuration of the input dataset, output dataset, and Copy activity.
4. Writes data to the sink/destination data store.

3.4.2 Creating Store Procedure for Incremental load.

Store procedure are a bunch of logical sql statements perform specific tasks. In this project we develop number of store procedures to perform data manipulation and other important tasks.

After calling the from the copying activity we stored the data in the staging area. Staging area is storage where data stored from the ADF. This data further use for the development process. The data movement can be understood from the below mentioned stages.

1. ADF to staging area using copy activity
2. Loading data from the staging to dbo (dbo represents the developer side environment) through the store procedure.
3. Creating views.

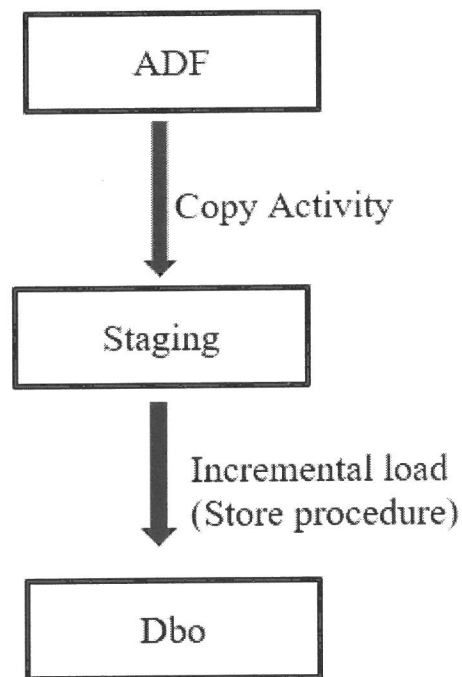


Fig 9: Incremental load from ADF to Dbo

Store procedure plays an important for loading the data by incremental load from staging to dbo. Creating a store procedure for the increment load based on the requirement of the client-side.

Our client requires the new data on staging by running the pipelines at once in the day and on the next day previous data will get removed from the staging area.

Removing data from the staging area after the incremental load maintains the client budget, for the staging area and it also saves the client money.

I have created the store procedures for different purposes as per client requirements. Some of the roles are mention below for which we have created the store procedures:

1. Incremental load
2. Deletion from the staging area after incremental load
3. Loading data from staging to Dbo.
4. Insertion
5. Updation
6. Removing duplicates
7. Testing
8. Maintain history in the slowly changing dimensions

```

19 insert into [dbo].[loy_promotions]
20 (
21     [PRM_CODE] ,
22     [PRM_OFFER_ID] ,
23     [PRM_OFFER_CODE] ,
24     [PRM_SHORT_NAME] ,
25     [PRM_LONG_NAME] ,
26     [PRM_START_DATE] ,
27     [PRM_END_DATE] ,
28     [PRM_CREATE_USER] ,
29     [PRM_CREATE_DATE] ,
30     [PRM_UPDATE_USER] ,
31     [PRM_UPDATE_DATE] ,
32     [PRM_LAST_MODIFIED] ,
33     [BONUS_BUY_ID] ,
34     [STATUS]
35 )
36
37 select
38     [PRM_CODE] ,
39     [PRM_OFFER_ID] ,
40     [PRM_OFFER_CODE] ,
41     [PRM_SHORT_NAME] ,
42     [PRM_LONG_NAME] ,
43     convert(date,nullif([PRM_START_DATE],'NULL')) ,
44     convert(date,nullif([PRM_END_DATE],'NULL')) ,
45     [PRM_CREATE_USER] ,
46     convert(date,nullif([PRM_CREATE_DATE],'NULL')) ,
47     [PRM_UPDATE_USER] ,
48     [PRM_UPDATE_DATE] ,
49     convert(date,nullif([PRM_LAST_MODIFIED],'NULL')) ,
50     [BONUS_BUY_ID] ,
51     [STATUS]
52 from [stg].[loy_promotions]
53 GO
54
55
56 |

```

Fig 10: Store Procedure for Staging to Dbo incremental load

3.4.3 Implementing Slowly changing dimensions

Slowly changing dimension or SCD in data warehousing plays a important role to analyze the historiacal aspects of the data. According to the client requirements we need to build the SCD_Type 2 to maintain the history of data.

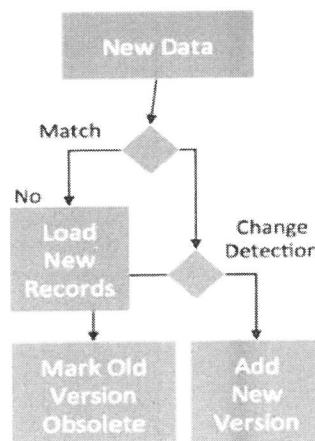


Fig 11: Flow of Slowly changing dimewnsions Type 2

Fig 11 represents the flow of the SCD type 2 dimensions, whenever new data coming in the dbo dimensional tables. Data fill follow the same process as shown in the fig 11. In SCD_type 2, changes occur in the dimensional tables will be well preserved in the SCD table. In this project, I have created SCD type 2 dimesioanl table for the customer dimensional table. The schema of the customer table is as shown below:

Table Name: Customer

Columns

- Customer_id: Primary Key, INT
- First name: VARCHAR
- Last name: VARCHAR
- Phone: INT
- Email: VARCHAR
- Street: VARCHAR
- City: VARCHAR
- State: VARCHAR
- Zip_Code: VARCHAR

The above mention schema is just the reference of the customer dimensional table schema use in the project. Now the below mention figure represents the SCD_T2 columns of the customer dimensional table.

customers (SCD T2)
customer_id
first_name
last_name
phone
email
street
city
state
zip_code
Updated_first_name
Updated_last_name
Updated_phone
Updated_email
Updated_street
Updated_city
Updated_state
Updated_zip_code
Version
Updation_Time

Fig 12: Customer Dimensional table SCD_Type 2

3.4.4 Views for Power BI report

As a result, we have to create the views to make the analytical reports on the Power BI. We are creating views instead of directly picking up the data from the tables according to the following reasons:

- Performance
- Views are the virtual table, if data changes in the defined table, updated data will be automatically reflected in the views.

Power BI engine helps to make powerful dashboard analytical graphs for prediction, analysis, etc. We connected the SSIS with the Power BI through the APIs for uploading the views query. Now through the API connection, views data will be shown on the Power BI dashboards or reports which help the client for his business analytical process for the betterment in the business strategies.

CHAPTER 4: TECHNOLOGY STACK

4.1 Architectural component used in the project

The following architectural component are used in the project according to the client use case:

4.1.1 Azure Blob Storage:

Azure Blob Storage helps you create data lakes for your analytics needs and provides storage to build powerful cloud-native and mobile apps. It optimize the cost with the tiered storage options for long term data scale up for the better and highend performance.

4.1.2 Azure Power BI

Azure Power Bi is a cloud based business intelligence tool provided by the Microsoft. It is available as the SaaS solution. Power Bi allow you to connect your data sources and visluiaze to discover important aspects of the data.

4.1.3 Azure SQL

Microsoft Azure SQL Database is a managed cloud database provided as part of Microsoft Azure. A cloud database is a database that runs on a cloud computing platform, and access to it is provided as a service. Managed database services take care of scalability, backup, and high availability of the database.

4.1.4 Azure Synapse Analytics

Azure Synapse is an enterprise analytics service that accelerates time to insight across data warehouses and big data systems. Azure Synapse brings together the best of **SQL** technologies used in enterprise data warehousing,

4.1.5 ADF

ADF stands for Azure Data factory is ETL tool and the part of the Microsoft Azure cloud ecosystem . It pull the data from the different data sources or storages for the ETL process which help the developer to transform and filter the data. In my project I am using the ADF to pull the client data from the different sources.

4.1.6 ADLS

ADLS stands for the Azure Data Lake Storage a service provided by the Microsoft as asecure file management system. It can work with the apache hadop environment and gives the industry standard security and huge amount of storage for the big data analytics

4.1.7 SSMS

SSMS stands for the SQL Server Management Studio is a tool for develop, access and manage the SQL server database, Azure SQL Database and Azure Synapse Analytics. It allow you to manage SQL by graphical interface.

CONCLUSION

While developing the system a conscious effort has been made to create and develop the dashboard, making use of available tools, techniques, and resources – that would generate a proper system for cases.

An eye has been kept on making it user-friendly. As in the case of any dashboard development process where there are several shortcomings, there have been some shortcomings in the development of this dashboard also.

In our project work, we attempt to develop the Power BI reports for the client. We develop this project that helps the client to make business decisions and strategies for advancement in business growth. By doing this project I have faced a real-time problem in developing enterprise software at a big level and learned the in deep and hands-on the ETL process by using enterprises platforms.

Our supervisor helps us by giving a roadmap on how to complete the task and grow our knowledge in the domain of big data.

I believe my time spent in research and discovering it was well worth it and contributed to finding an acceptable solution to build a fully functional dashboard. This experience helps me to understand the value of time management and how to be self-motivated.

REFERENCES

- <https://www.celebaltech.com/>
- <https://docs.microsoft.com/en-us/azure/databricks/getting-started/overview>
- <https://azure.microsoft.com/en-us/services/storage/data-lake-storage/>
- <https://medium.com/microsoftazure/building-your-data-lake-on-adls-gen2-3f196fc6b430>
- <https://powerbi.microsoft.com/en/>
- <https://azure.microsoft.com/en-us/services/databricks/>
- https://www.tutorialspoint.com/dbms/dbms_data_models.html
- <https://azure.microsoft.com/en-in/services/devops/>
- <https://docs.microsoft.com/en-us/azure/devops/user-guide/what-is-azure-devops>
- <https://azure.microsoft.com/en-us/services/developer-tools/power-bi/>
- <https://www.tutorialsteacher.com/sqlserver/sql-server-management-studio>
- <https://data-flair.training/blogs/power-bi-architecture/>
- <https://docs.microsoft.com/en-us/azure/data-factory/monitor-using-azure-monitor>



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📍 India: A-2 7th floor, UDB Corporate Tower, J.L.N. Marg, Jaipur

STRICTLY CONFIDENTIAL

Dated: 26th May, 2022

Ongoing Internship Certificate

To Whomsoever It May Concern

This is to certify that **Aayush Sharma** had undertaken Internship with Celebal Technologies, Jaipur, starting from 17th January 2022 in **Big Data & EDW** Department.

During his 4 months of Internship, he was working under the mentorship of **Mr. Shivam Patel**.

Best Regards

Tejal

Tejal Mangal
Sr. Executive
Human Resources
Celebal Technologies