TechSaksham

CaseStudyReport

DataAnalyticswithPower BI

“Inventoryandsalesanalysisof Departmental store”

“BishopAmbroseCollege”

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ABSTRACT

Inthedigitalage,datahasbecomeaninvaluable assetforbusinesses,particularlyinthe banking sector. The proposed project, “Inventory and sales analysis of departmental store” aims to leverage PowerBI, a leading business intelligence tool, to analyze and visualize real time customer data. This project will enable departmental store to gain deep insights into customer behavior, preferences, and trends, thereby facilitating data-driven decision-making and enhancing customer satisfaction. The real-time analysis will allow departmental store to respond promptly to changes in customer behavior or preferences, identify opportunities for cross-sellingandup-selling,andtailortheirproducts andservicestomeetcustomerneeds.The project will also contribute to the broader goal of digital transformation in the departmental stores, promoting efficiency, innovation, and customer-centricity

INDEX

CHAPTER 1

INTRODUCTIO

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ProblemStatement

In today's competitive departmental store, understanding customer behavior and preferences is crucial for customer retention and revenue generation. However, departmental store often face challenges in analyzing customer data due to the sheer volume and velocity of data generated.Traditional data analysis methods are time-consuming and often fail to provide real-time insights.This lackofreal-timeanalysis can leadto missedopportunities forcustomer engagement,cross-selling,andup-selling,impactingthedepartmentalstorerevenuegeneration and customer satisfaction. Furthermore, the complexity and diversity of customer data, which includes transaction history, customer feedback, and demographic data, pose additional challenges for data analysis.

Proposed Solution

The proposed solution is to develop a PowerBI dashboard that can analyze and visualize realtime customer data. The dashboard will integrate data from various sources such as buying history, customer feedback, and demographic data. It will provide a comprehensive view of customer behavior, preferences, and trends, enabling departmental store to make informed decisions. The dashboard will be interactive, user-friendly, and customizable, allowingdepartmentalstoreto tailor itto theirspecificneeds.Thereal-timeanalysiscapability of the dashboard will enable departmental store to respond promptly to changes in customer behavior or preferences, identify opportunities for cross-selling and up-selling, and tailor their products and services to meet customer needs

Feature

- **Real-TimeAnalysis**:Thedashboardwillprovidereal-timeanalysis ofcustomerdata.
- **CustomerSegmentation**:Itwillsegmentcustomersbasedonvariousparameterslike age,
- name,buyingbehavior,etc.
- **TrendAnalysis**:Thedashboardwillidentifyanddisplaytrendsincustomer behavior.
- **PredictiveAnalysis**:Itwillusehistoricaldatatopredictfuturecustomerbehavior.

Advantages

- **Data-DrivenDecisions**:departmentalstorecanmakeinformeddecisionsbasedonreal-time dataanalysis.
- **ImprovedCustomerEngagement**:Understandingcustomerbehaviorandtrendscan help banks engage with their customers more effectively.
- **IncreasedRevenue**:Byidentifyingopportunitiesforcross-sellingandup-selling, departmental storecanincreasetheir revenue.

Scope

The scope of this project extends to all departmental store that aim to leverage data for decision-makingand customerengagement.Theprojectcanbefurther extendedtoincorporate more data sources and advanced analytics techniques, such as machine learning and artificial intelligence, to provide more sophisticated insights into customer behavior. The project also has the potential to be adapted for other sectors, such as retail, healthcare, and telecommunications, where understanding customer behavior is crucial. Furthermore, the project contributes to the broader goal of online buying details in the departmental store, promoting efficiency, innovation, and customer-centricity.

CHAPTER2

SERVICESANDTOOLS REQUIRED

ServicesUsed

Data Collection and Storage Services: departmental store need to collect and store customer data in real-time. This could be achieved through services like Azure Data Factory,AzureEventHubs,orAWSKinesisforreal-timedata collection,andAzure SQL Database or AWS RDS for data storage.

- **DataProcessingServices**:ServiceslikeAzureStreamAnalyticsorAWSKinesis Data Analytics can be used to process the real-time data.
- **MachineLearningServices**:AzureMachineLearningorAWSSageMakercanbe used to build predictive models based on historical data.

ToolsandSoftwareused

Tools:

- **PowerBI**:Themain toolforthisprojectisPowerBI,whichwillbeused tocreate interactive dashboards for real-time data visualization.

- **PowerQuery**:Thisisadataconnectiontechnology thatenablesyoutodiscover, connect, combine, and refine data across a wide variety of sources.

SoftwareRequirements:

- **PowerBIDesktop**:ThisisaWindowsapplicationthatyoucanusetocreatereports and publish them to PowerBI.

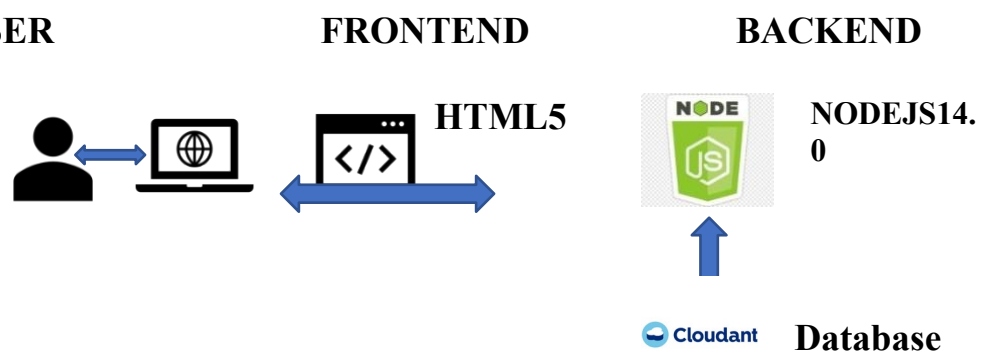
- **PowerBIService**:ThisisanonlineSaaS(Software asaService) servicethatyouuse to publish reports, create new dashboards, and share insights.

- **PowerBIMobile**:Thisisamobileapplicationthatyoucanusetoaccessyourreports and dashboards on the go.

CHAPTER 3

PROJECTARCHITECTURE

Architecture



Here'sahigh-levelarchitectureforttheproject:

1. **DataCollection**:Real-timecustomerdataiscollectedfromvarious sourceslikebank transactions, customer interactions, etc. This could be achieved using services like Azure Event Hubs or AWS Kinesis.
2. **DataStorage**:Thecollecteddataisstored inadatabaseforprocessing.AzureSQL Database or AWS RDS can be used for this purpose.
3. **DataProcessing**:Thestoreddata isprocessedinreal-timeusingserviceslikeAzure Stream Analytics or AWS Kinesis Data Analytics.
4. **Machine Learning**: Predictive models are built based on processed data using Azure MachineLearningorAWSSageMaker.Thesemodelscanhelpinpredictingcustomer behavior, detecting fraud, etc.
5. **DataVisualization**:Theprocesseddataand theresultsfromthepredictivemodelsare visualized in real-time using PowerBI. PowerBI allows you to create interactive dashboards that can provide valuable insights into the data.
6. **DataAccess**:ThedashboardscreatedinPowerBIcanbeaccessedthroughPowerBI

Desktop, PowerBI Service (online), and PowerBI Mobile.

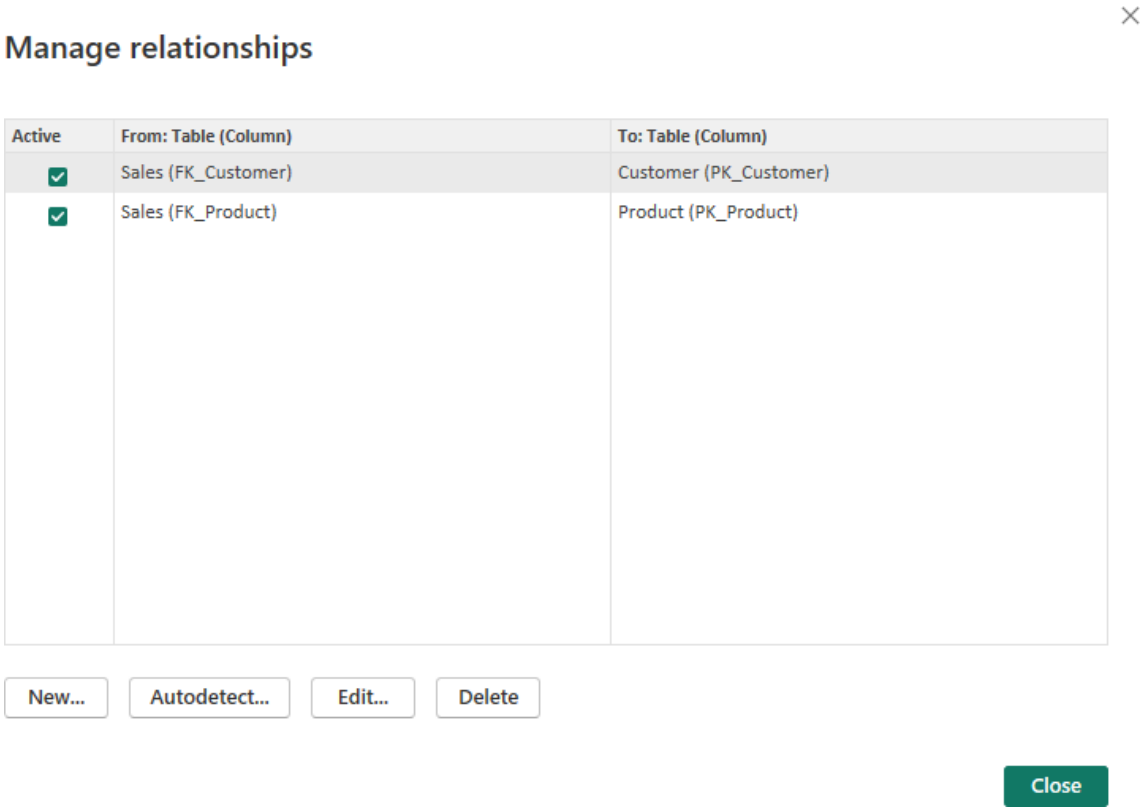
This architecture provides a comprehensive solution for real-time analysis of bank customers. However,it'simportanttonotethatthespecificarchitecturemayvarydependingonthebank's existing infrastructure, specific requirements, and budget. It's also important to ensure that all tools and services comply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

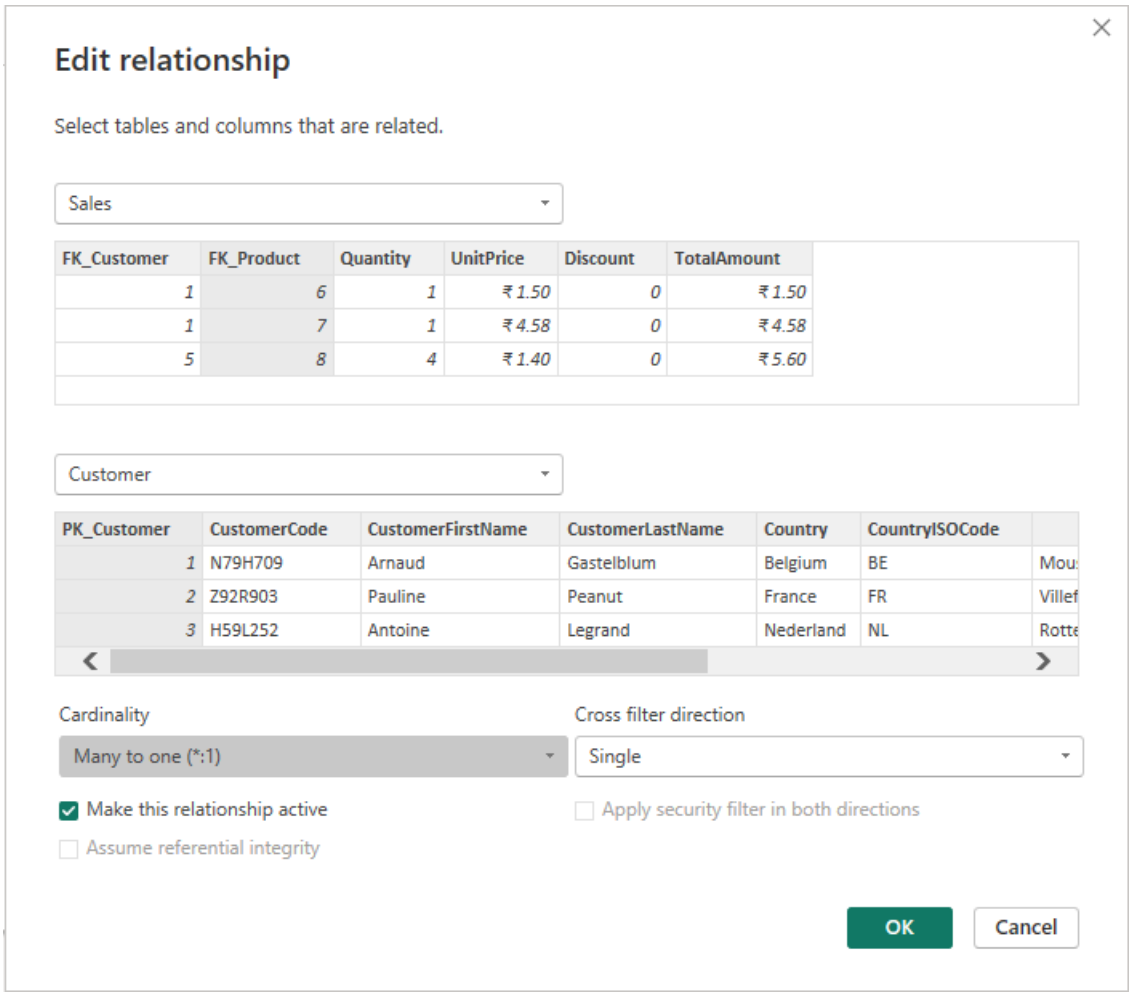
CHAPTER4

MODELINGAND RESULT

Manage relationship

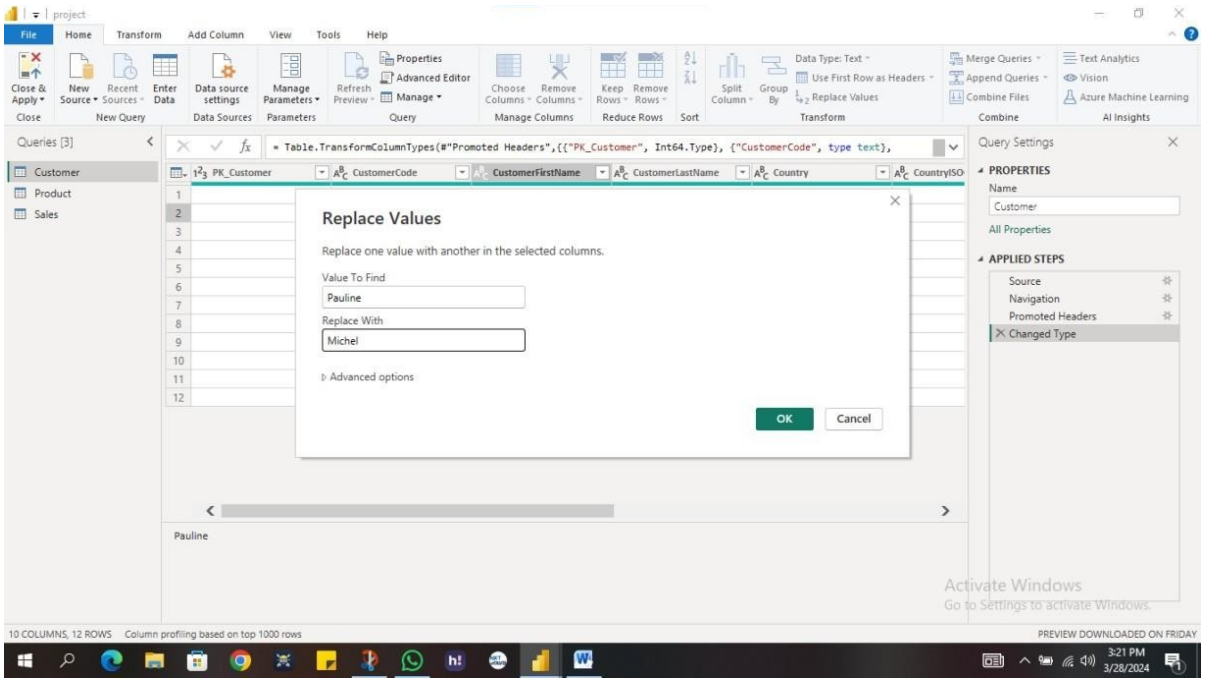
The“disp”filewillbeusedasthemainconnectorasitcontainsmostkeyidentifier (account id, client id and disp id) which can be use to relates the 8 data files together. The “district” file is use to link the client profile geographically with “sales id”



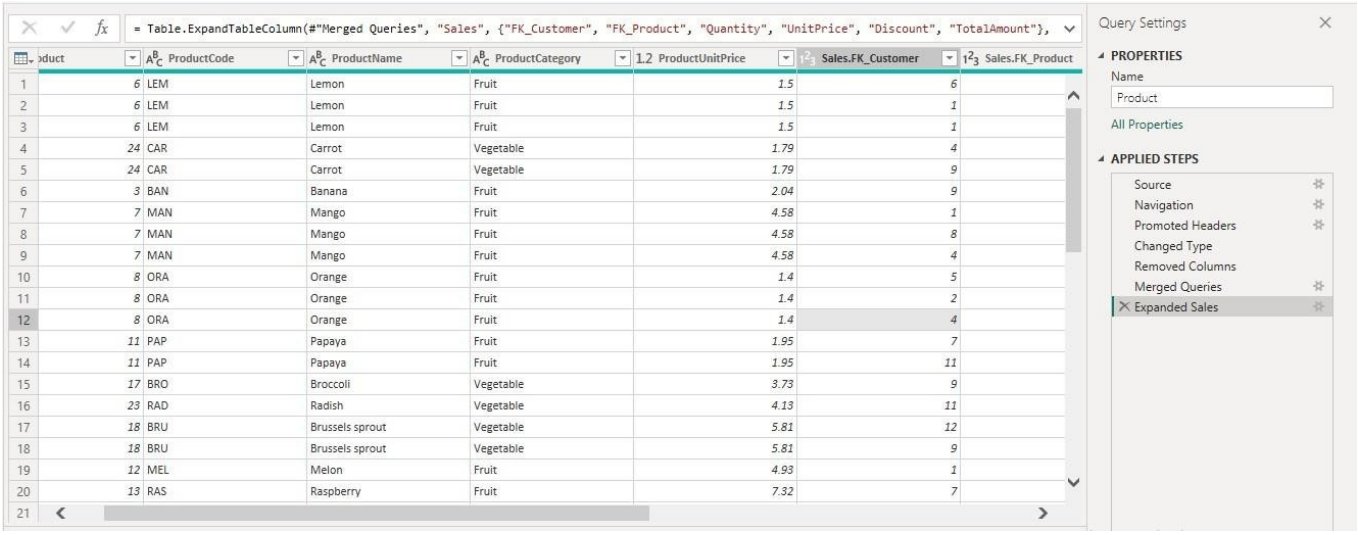

Edit relationship
Select tables and columns that are related.
Sales
FK_Customer FK_Product Quantity UnitPrice Discount TotalAmount
1 6 1 ₹1.50 0 ₹1.50
1 7 1 ₹4.58 0 ₹4.58
5 8 4 ₹1.40 0 ₹5.60
Customer
PK_Customer CustomerCode CustomerFirstName CustomerLastName Country CountryISOCode
1 N79H709 Arnaud Gastelblum Belgium BE
2 Z92R903 Pauline Peanut France FR
3 H59L252 Antoine Legrand Nederland NL
Cardinality
Many to one (*:1)
Cross filter direction
Single
Make this relationship active
Apply security filter in both directions
Assume referential integrity
OK
Cancel

Replacingvalues

SetsomefieldstoEnglishforeasyunderstanding,wereplacevaluestoEnglish with the Power Query Editor.



ThenmergecolumnbyRegionanddirection.Refertoappliedstepsfordetails.



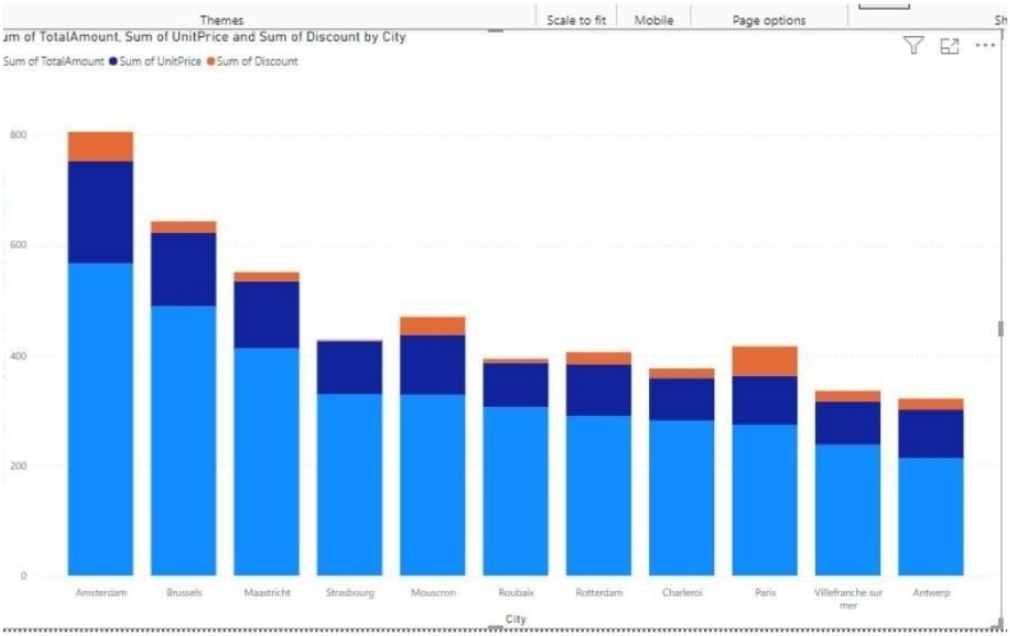
Groupingofagebyranges

Asproductisgroupedbytype ofcategorywhichcountthe cateory.


= Table.Group(#"Removed Columns", {"ProductCategory"}, {{"Number of Categories", each Table.RowCount(_), Int64.Type}})
ProductCategory
Number of Categories
1 Fruit 15
2 Vegetable 10
Query Settings
PROPERTIES
Name
Product
All Properties
APPLIED STEPS
Source
Navigation
Promoted Headers
Changed Type
Removed Columns
Grouped Rows

Dashboard


Objective : To Increase Sales and Profit in Department Store
Page 1
Page 2
Page 3


Themes
Scale to fit
Mobile
Page options
Sum of TotalAmount, Sum of UnitPrice and Sum of Discount by City
Sum of TotalAmount
Sum of UnitPrice
Sum of Discount
800
600
400
200
0
Amsterdam
Brussels
Maastricht
Strasbourg
Mouscron
Roubaix
Rotterdam
Charleroi
Paris
Villefranche sur mer
Antwerp
City


₹ 4.27
Average of UnitPrice
952
Sum of Quantity
₹ 13.81
Average of TotalAmount
Average of TotalAmount
₹ 13.81
₹ 0.00
₹ 27.62
Sum of Quantity and Average of TotalAmount by ProductUnitPrice
Sum of Quantity
Average of TotalAmount
ProductUnitPrice
Sum of Quantity and Average of TotalAmount
Sum of Quantity, Average of TotalAmount and Average of UnitPrice by ProductCategory
ProductCat...
Fruit
Vegetable
Average of UnitPrice, Sum of Quantity, Average of TotalAmount and Sum of Discount

CONCLUSION

The project “Real-Time Analysis of departmental store Customers” using PowerBI has successfully demonstrated the potential of data analytics in the departmental store. The real time analysis of customer data has provided valuable insights into customer behavior, preferences, and trends, thereby facilitating informed decision-making. The interactive dashboards and reports have offered a comprehensive view of customer data, enabling the identification of patterns and correlations. This has not only improved the efficiency of data analysis but also enhanced the departmental store’s ability to provide personalized services to its customers. The project has also highlighted the importance of data visualization in making complexdatamoreunderstandableandaccessible. TheuseofPowerBIhasmadeitpossibleto present data in a visually appealing and easy-to-understand format, thereby aiding in better decision-making.

FUTURE SCOPE

Thefuturescopeofthisprojectisvast. With theadventofadvancedanalyticsandmachine learning, PowerBI can be leveraged to predict future trends based on historical data. Integrating these predictive analytics into the project could enable the departmental store to anticipatecustomerneedsandproactivelyoffersolutions.Furthermore,PowerBI'scapability to integrate with various data sources opens up the possibility of incorporating more diverse datasets for a more holistic view of customers. As data privacy and security become increasingly important, future iterations of this project should focus on implementing robust datagovernancestrategies. This would ensurethesecurehandling of sensitivecustomer data whilecomplyingwithdataprotectionregulations.Additionally,theprojectcouldexplore the integration of real-time data streams to provide even more timely and relevant insights. This could potentially transformtheway banks interactwith their customers, leading to improved customer satisfaction and loyalty.

REFERENCES

https://medium.com/analytics-vidhya/analysis-of-department-customers-using-dashboard-in-power-bi-a366f2b3e563

LINK

https://github.com/githubtraining/hellogitworld.git