Tech Saksham

CASE STUDY REPORT

Data Analytics with Power BI

Real-Time Analysis of Bank customers (Data Analytics with power BI)

Government Arts college For Women

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ABSTRACT

In the banking sector, data analysis involves using fashionable special effects and modern tools to explore data. The utilization of such modern research methods has been increasing rapidly and widespread throughout the nation. The main objective is to bring customer satisfaction features a positive response on customer loyalty within the banking system, especially with the income improving, the connection between them becomes more and more strong. Finally, the banking systems mainly focus on customer satisfaction and the ways to increase customer loyalty. They are constantly working on the ways to strengthen their business benefits like proper product promotion to the customers and to reduce the improper functioning of online bank applications and so on.

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CHAPTER:1

INTRODUCTION

0verview of the importance of real-time analysis in the banking sector.

Introduction to the case study focusing on the application of real- time analysis in understanding bank customer behaviour.

BACKGROUND

Explanation of the banking industry's shift towards data-driven decision making.

Importance of real - time data analysis in providing personalized banking experiences.

OBJECTIVE

Clear statement of the objectives of the case study, such as improving customer satisfaction, reducing churn, or increasing cross – selling opportunities.

CHALLENGES

Handling large volumes of diverse data from multiple sources, including transaction histories, demographic information, and digital interactions.

Ensuring data privacy and compliance with regulatory requirements.

Implementing a scalable and efficient real- time analytics solution.

Developing algorithms to predict customer behaviour and preferences accurately.

Strategies and solutions for overcoming these challenges such as data governance frameworks, cloud – based architectures, or collaboration with fintech partners.

METHODOLOGY

DATA COLLECTION:

Swift bank collects data from various sources, including transaction history, customer demographics, online interactions, and feedback.

REAL-TIME DATA PROCESSING:

The collected data is processed in real-time using advanced analytics and machine learning algorithms.

CUSTOMER SEGMENTATION:

Based on transaction patterns, demographics, and behaviour, customers are segmented into different groups for targeted marketing and personalized services.

REAL-TIME DECISION MAKING

Swift bank uses real – time insights to make decisions on product recommendations, risk management, fraud detection, and customer service.

CONTINOUS IMPROVEMENT

The bank continually refines its models and algorithms based on feed back and evolving customer preferences.

ADVANTAGES

IMMEDIATE FRAUD DETECTION: Real-time analysis can quickly identify suspicious transactions, enabling banks to react promptly to potential fraud attempts and protect their customer's accounts.

PERSONALIZED OFFERINGS: By analysing customer behaviour in real time, banks can tailor their offerings and promotions to individual preferences, enhancing customer satisfaction and loyalty.

RISK MAMAGEMENT: Real-time analysis allows banks to assess risk factors associated with customer activities promptly, enabling them to make informed decisions to mitigate risks effectively.

ENHANCED CUSTOMER SERVICE: banks can provide timely assistance and support to customers by analysing their interactions in real-time, leading to improved overall customer experience.

OPERATIONAL EFFICIENCY: Real-time analysis streamlines operational processes by identifying bottlenecks or inefficiency promptly, allowing banks to optimize their resources and improve productivity.

COMPETETIVE ADVANTAGE: Banks that leverage real-time analysis gain a competitive edge by staying ahead of market trends, responding swiftly to changing customer needs, and offering innovative solutions.

REGULATORY COMPLIANCE: Real-time analysis helps banks ensure compliance with regulatory requirements by monitoring transactions and detecting ant potential violations promptly.

FRAUD PREVENTION: By continuously monitoring customer activities, real-time analysis can proactively identify patterns indicative of fraudulent behaviour, helping banks prevent financial losses and protect their reputation.

FEATURE

REAL TIME ANALYSIS: The dashboard will provide real-time analysis of customer data.

TREND ANALYSIS: The dashboard will identify and display trends in customer behaviour.

PREDICTIVE ANALYSIS: It will use historical data to predict future customer behaviour.

SCOPE

Analytics plays a vital role in the banking sector, transforming traditional practices and guiding strategic decision-making. Through the use of advanced data analysis techniques, banks can effectively manage risks, detect fraud, understand customer behaviour, enhance operational efficiency, ensure regulatory compliance, and innovative product offerings. By leveraging banking analytics can uncover new growth opportunities, improve customer satisfaction, and achieve sustainable success in an increasingly data world.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

Services used:

Data streaming platforms: Services like Apache Kafka, Amazon kinesis, or google cloud Pub/sub facilitate the ingestion and processing of real-time data streams from

various

sources, including transactional systems, customer interactions, and external data feeds.

Real-time Dashboards and visualization tools: services like Tableau Power BI, or Google Data Studio provide interactive dashboards and visualizations that enable banks to monitor key metrics, track performance and gain actionable insights from real-time data analysis.

API Integration Platform: Banks leverage API integration platforms like IBM API connect to integrate real-time data from internal systems, third- party providers, and external sources, enabling seamless data exchange and interoperability.

TOOLS AND SOFTWARE USED

TOOLS

POWER BI: the main tool for this project is power BI which will be used to create interactive dashboards for real-time data visualization.

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 REQUIREMENTS

POWER BI DESKTOP: This is a windows application that you can use to create reports and publish them to Power BI.

POWER BI SERVICE: This is an online SaaS(Software as a service) service that you use to publish reports, create new dashboards and share insights.

POWER BI MOBILE: This is a mobile application that you can use to access your reports and dashboards on the go.

CHAPTER:3

PROJECT ARCHITECTURE

DATACOLLECTION: real time customer data is collected from various sources like bank transactions, customer interactions, etc. this could be achieved using services like Azure Event Hubs or AWS kinesis.

DATA STORAGE: The collected data is stored in a database for processing. Azure SQL Database or AWS Kinesis.

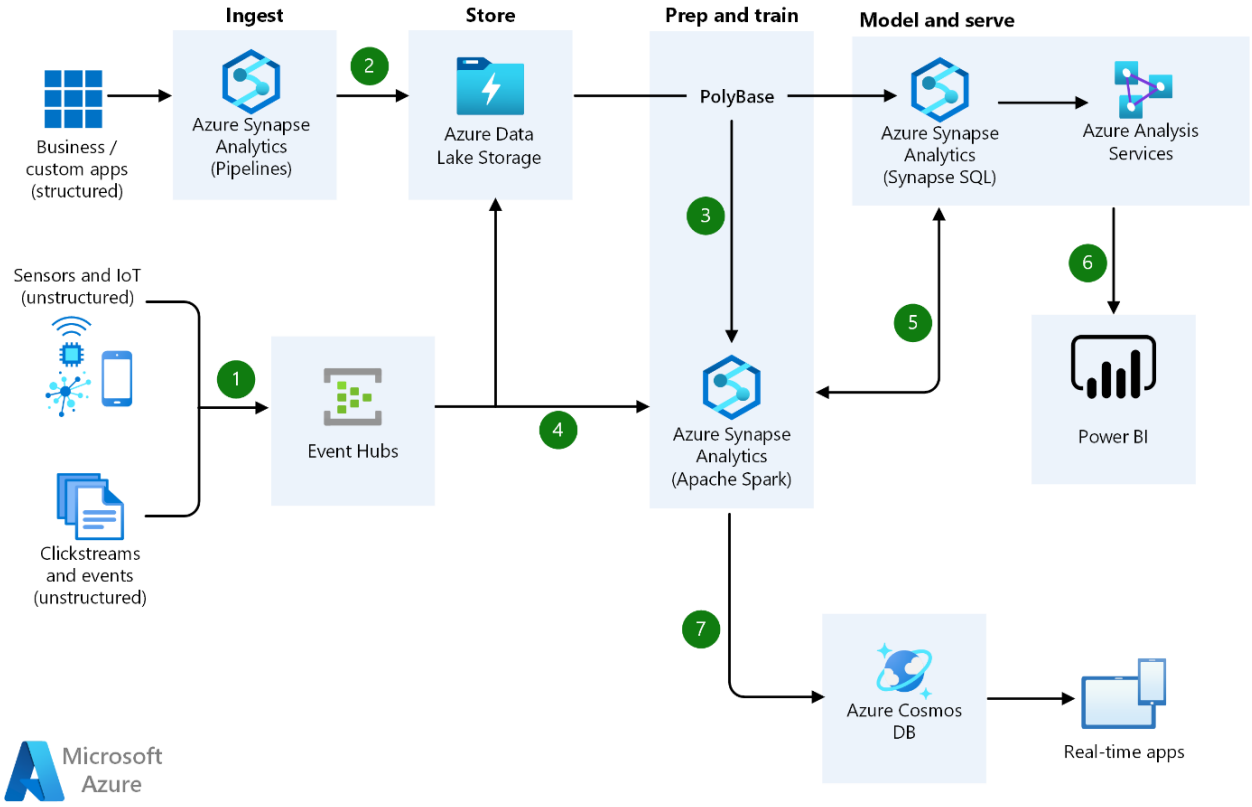
DATA PROCESSING: The stored data is processed in real-time using services like Azure Stream Analytics or AWS Kinesis Data Analytics.

MACHINE LEARNING: Predictive models are built based on processed data using Azure Machine Learning or AWS Sage maker. These models can help in predicting customer, detecting fraud etc.

DATA VISUALIZATION: The processed data and the results from the predictive models are visualized in real-time using Power BI. Power BI allows you to create interactive dashboards that can provide valuable insights into the data.

DATA ACCESS: The dashboards created in Power BI can be accessed through power BI Desktop, powerful service (online) and Power BI Mobile.

Project architecture:



CHAPTER :4

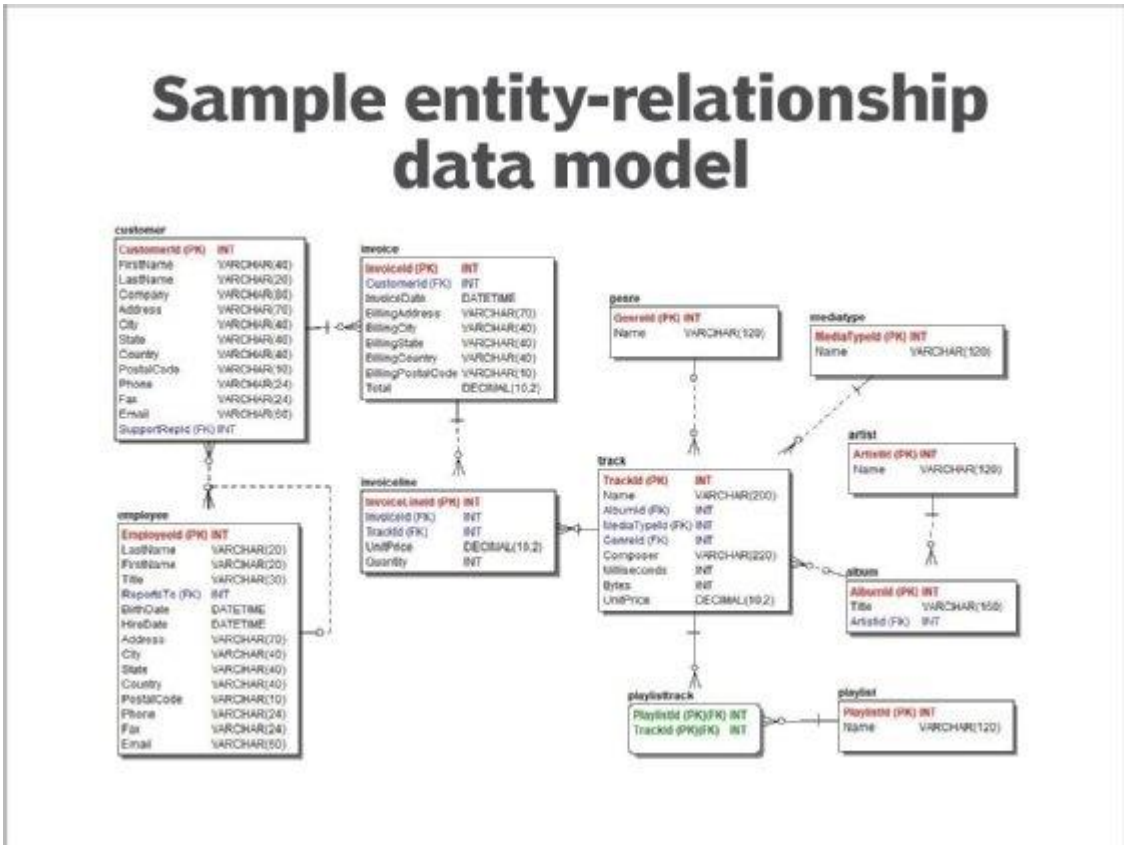
MODELING AND RESULT

Manage relationship

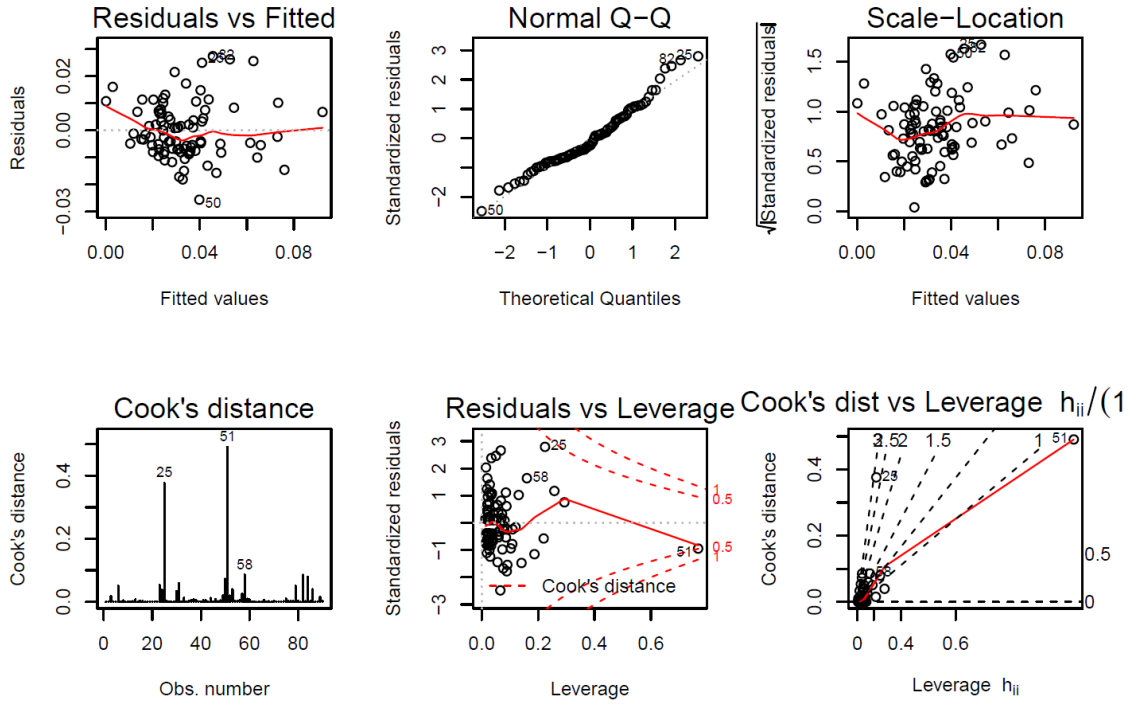
This is a sample of entity relationship data model

STUDENT: Attributes could include student ID, name, address, date of birth, etc.

COURSE: Attributes should include course Id Account ID, Amount, payment.



This is a modelling and result for residual vs fitted in fitted values, theoretical quartiles, scale-location leverage, cook's distance vs leverage.



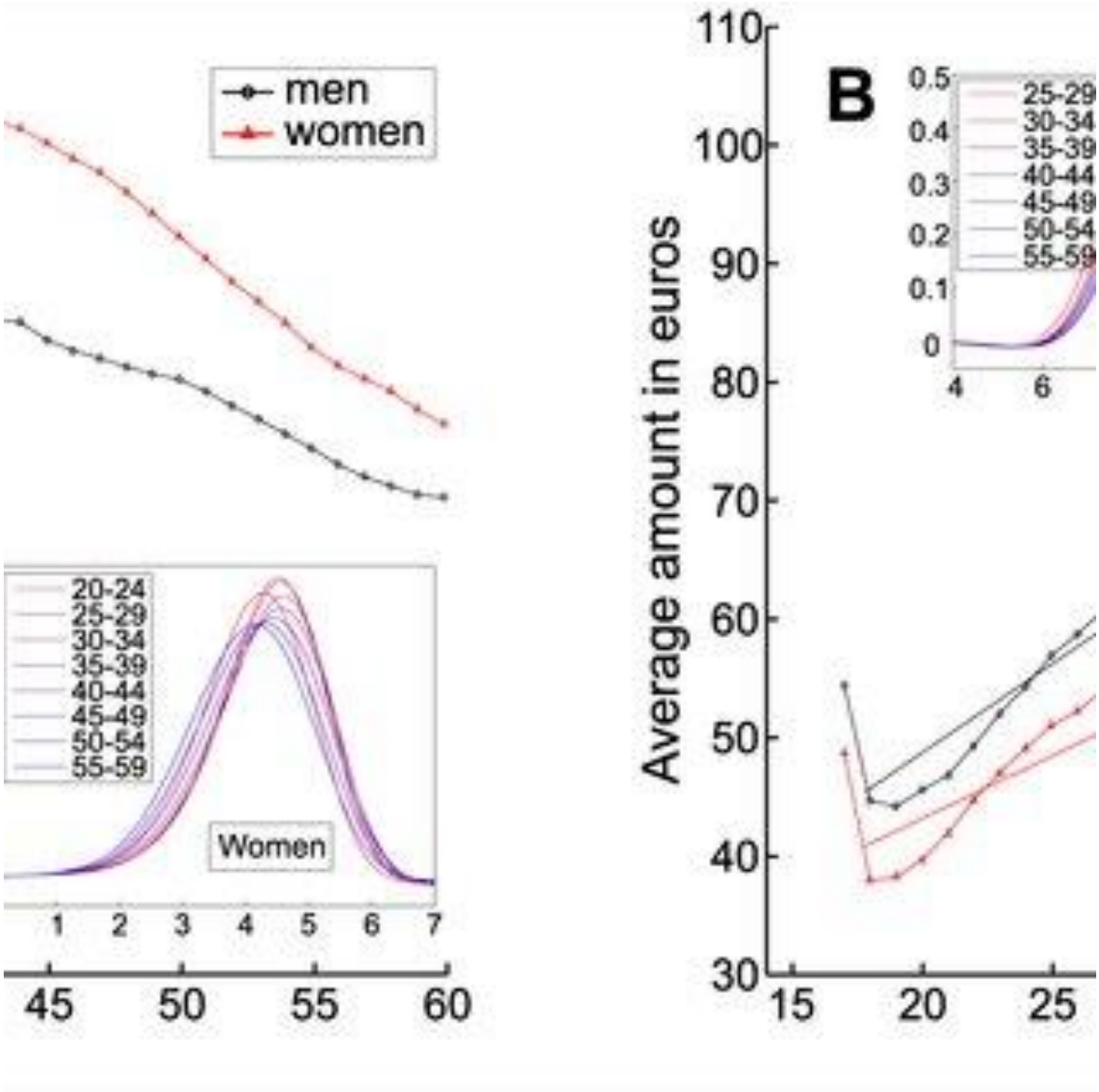
BETWEEN AGE AND GENDER

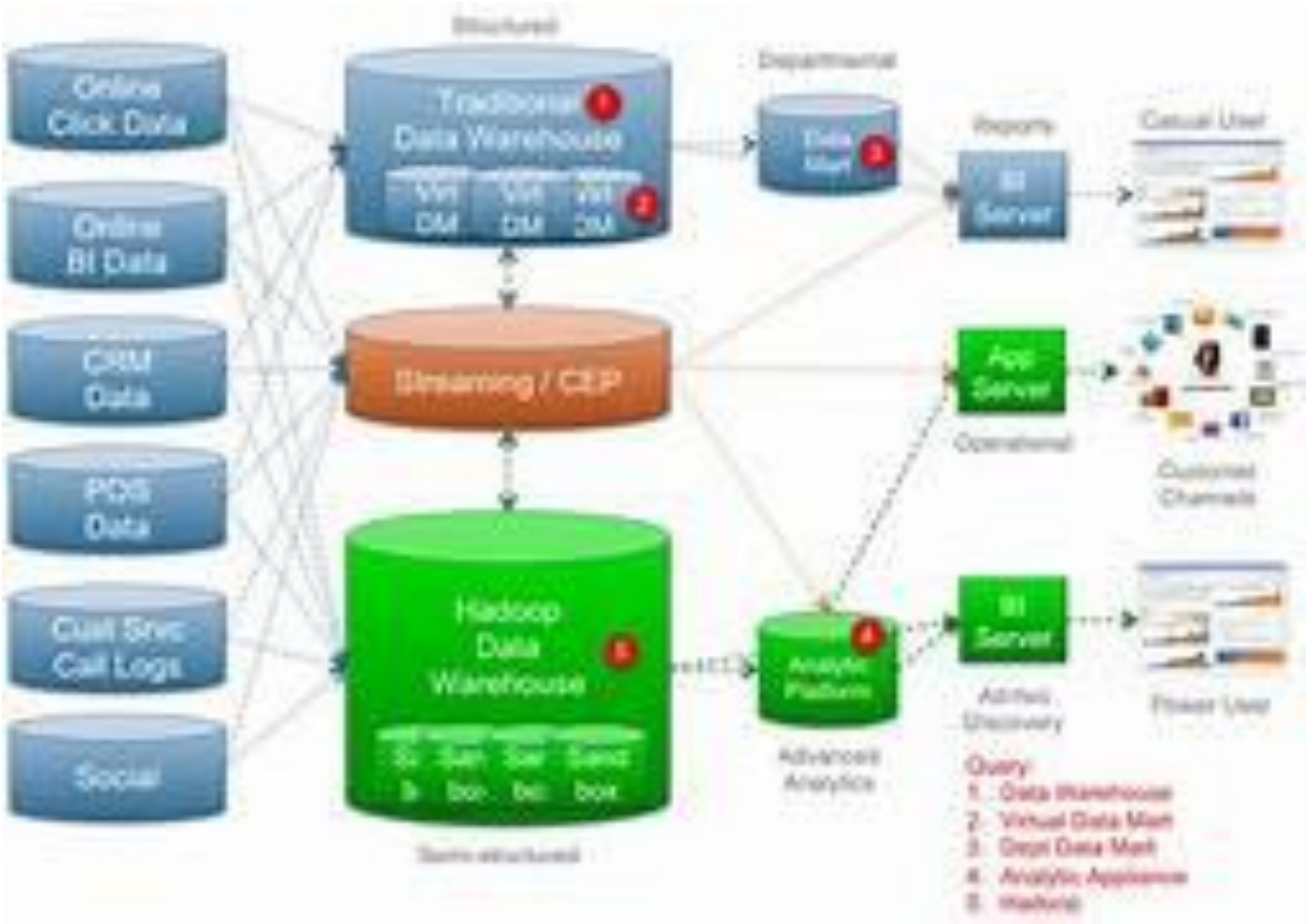
This is a result between age and gender from age 7years to 11 years and gender- female and male.

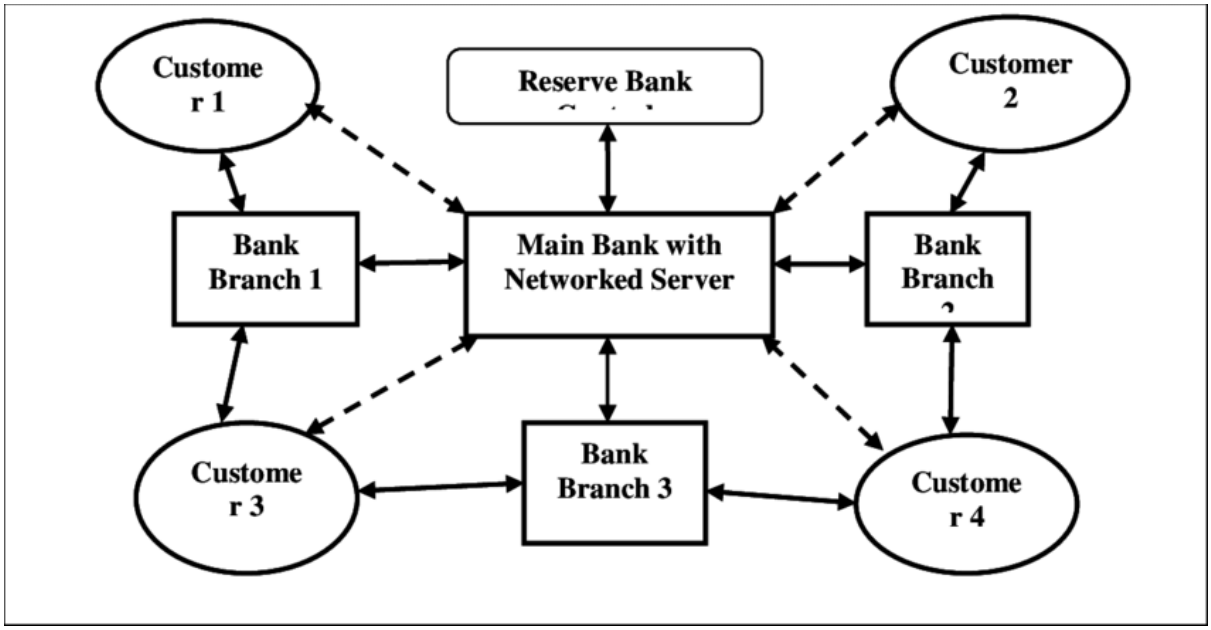
(N=880)

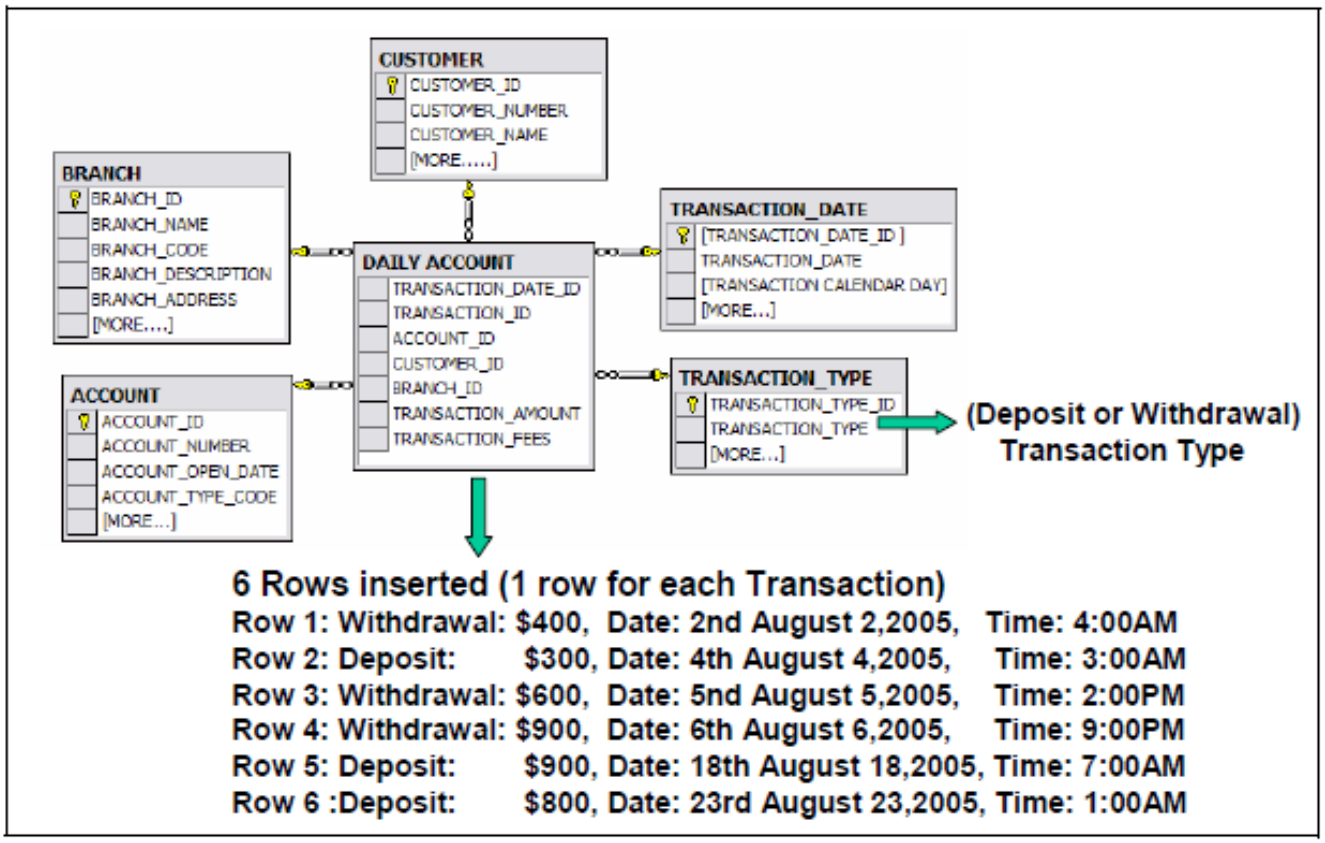
			Gender		Total
			Female	Male	212
Age	7 y.o.	No	106	106	
		% . Age	50%	50%	100%
	8 y.o.	No	132	122	254
		% . Age	59,3%	40,7%	100%
	9 y.o	No	67	88	155
		% . Age	36,0%	64%	100%
	10 y.o	No	96	93	189
		% . Age	52,2%	47,8%	100%
	11 y.o	No	37	33	70
		% . Age	62,3%	37,7%	100%
Total		No	438	442	880
		% . Age	49,9%	50,1%	100%

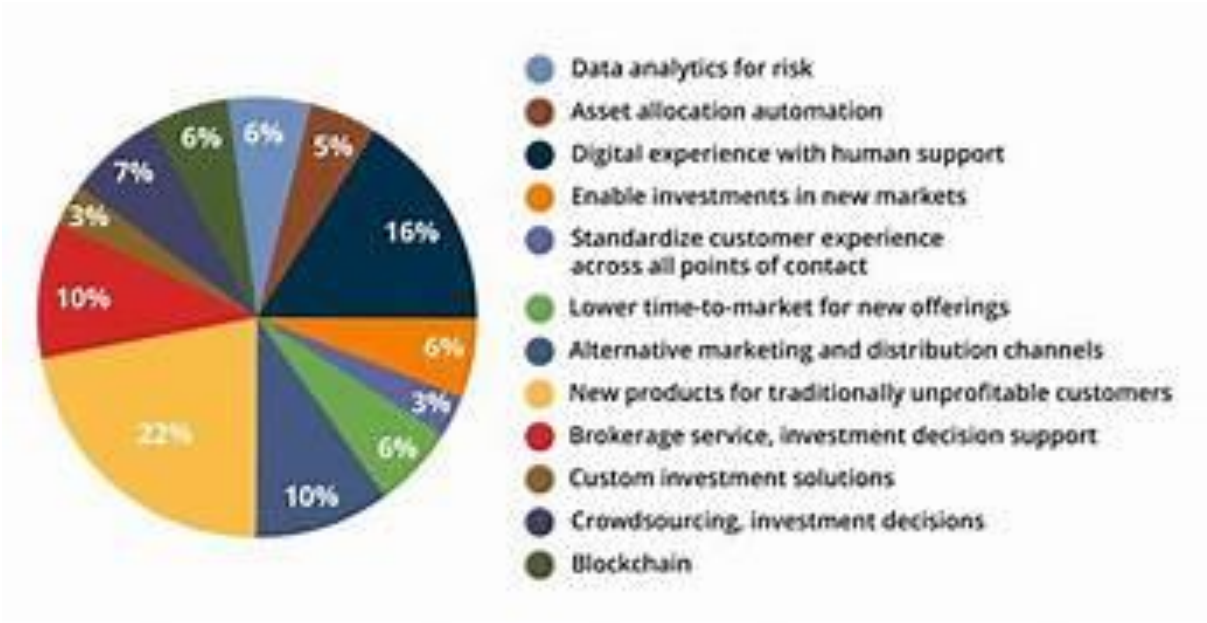
This is between men and women of average amount in euros

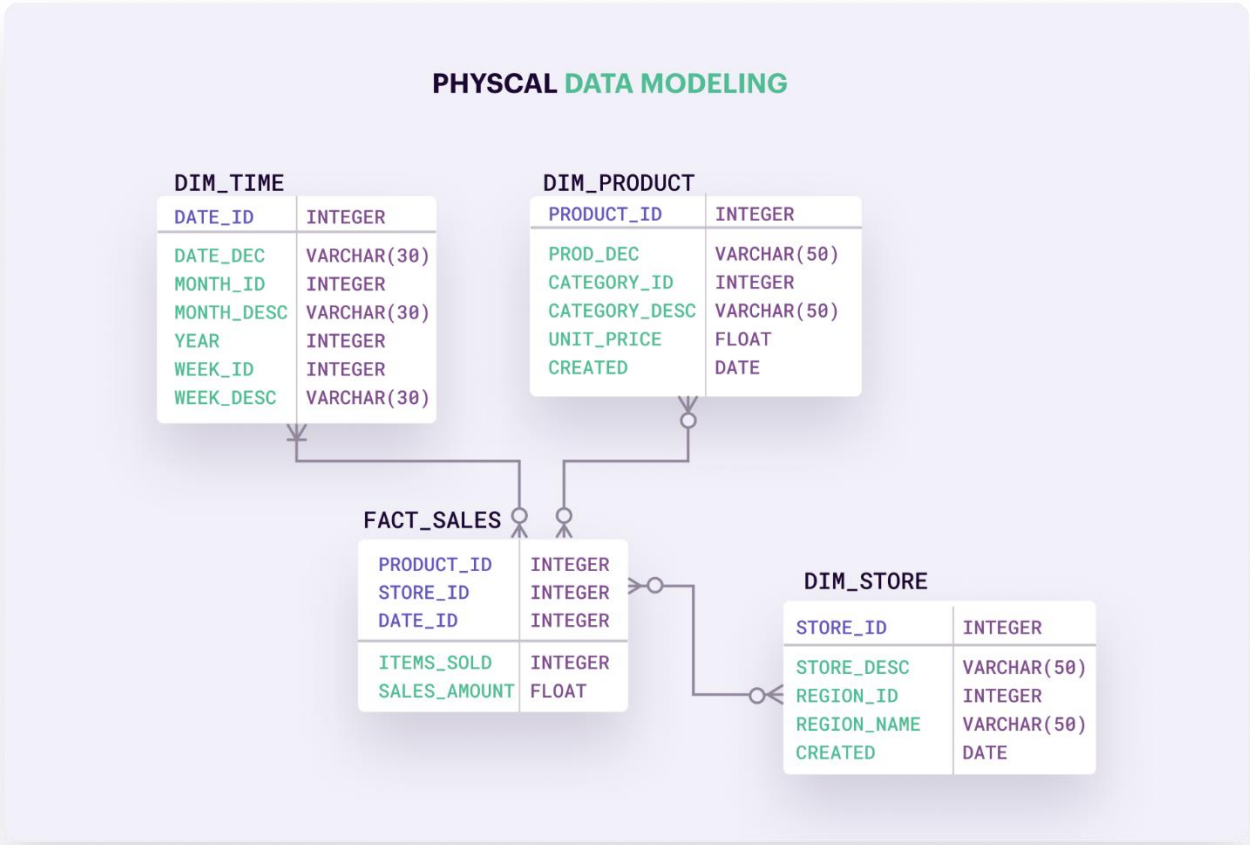



Online Click Data
Online BI Data
CRM Data
PDS Data
Cust Srvc Call Logs
Social
Traditional Data Warehouse
Streaming / CEP
Hadoop Data Warehouse
Data Mart
BI Server
App Server
Analytic Platform
BI Server
Query
1. Data Warehouse
2. Virtual Data Mart
3. Dept Data Mart
4. Analytic Appliance
5. Hadoop

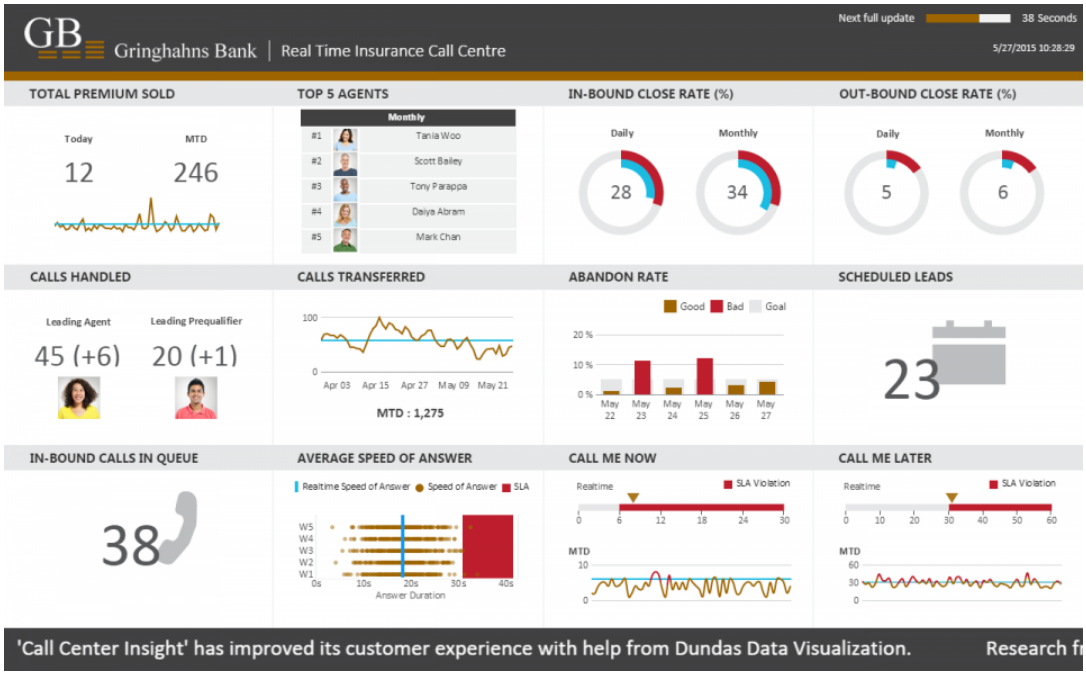

Custome r 1
Reserve Bank
Customer 2
Bank Branch 1
Main Bank with Networked Server
Bank Branch
Custome r 3
Bank Branch 3
Custome r 4


CUSTOMER
CUSTOMER_ID
CUSTOMER_NUMBER
CUSTOMER_NAME
[MORE.....]
BRANCH
BRANCH_ID
BRANCH_NAME
BRANCH_CODE
BRANCH_DESCRIPTION
BRANCH_ADDRESS
[MORE....]
DAILY ACCOUNT
TRANSACTION_DATE_ID
TRANSACTION_ID
ACCOUNT_ID
CUSTOMER_ID
BRANCH_ID
TRANSACTION_AMOUNT
TRANSACTION_FEES
TRANSACTION_DATE
[TRANSACTION_DATE_ID]
TRANSACTION_DATE
[TRANSACTION CALENDAR DAY]
[MORE...]
TRANSACTION_TYPE
TRANSACTION_TYPE_ID
TRANSACTION_TYPE
[MORE...]
ACCOUNT
ACCOUNT_ID
ACCOUNT_NUMBER
ACCOUNT_OPEN_DATE
ACCOUNT_TYPE_CODE
[MORE...]
(Deposit or Withdrawal)
Transaction Type
6 Rows inserted (1 row for each Transaction)
Row 1: Withdrawal: $400, Date: 2nd August 2,2005, Time: 4:00AM
Row 2: Deposit: $300, Date: 4th August 4,2005, Time: 3:00AM
Row 3: Withdrawal: $600, Date: 5nd August 5,2005, Time: 2:00PM
Row 4: Withdrawal: $900, Date: 6th August 6,2005, Time: 9:00PM
Row 5: Deposit: $900, Date: 18th August 18,2005, Time: 7:00AM
Row 6 :Deposit: $800, Date: 23rd August 23,2005, Time: 1:00AM

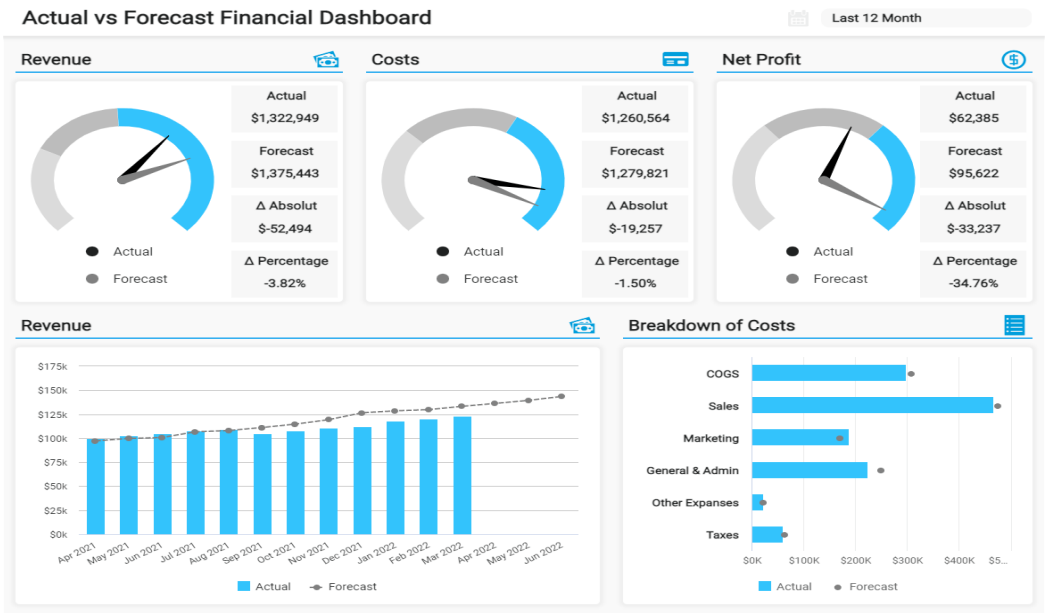

6%
6%
5%
16%
6%
3%
6%
22%
10%
10%
3%
7%
Data analytics for risk
Asset allocation automation
Digital experience with human support
Enable investments in new markets
Standardize customer experience across all points of contact
Lower time-to-market for new offerings
Alternative marketing and distribution channels
New products for traditionally unprofitable customers
Brokerage service, investment decision support
Custom investment solutions
Crowdsourcing, investment decisions
Blockchain


PHYSCAL DATA MODELING
DIM_TIME
DATE_ID INTEGER
DATE_DEC VARCHAR(30)
MONTH_ID INTEGER
MONTH_DESC VARCHAR(30)
YEAR INTEGER
WEEK_ID INTEGER
WEEK_DESC VARCHAR(30)
DIM_PRODUCT
PRODUCT_ID INTEGER
PROD_DEC VARCHAR(50)
CATEGORY_ID INTEGER
CATEGORY_DESC VARCHAR(50)
UNIT_PRICE FLOAT
CREATED DATE
FACT_SALES
PRODUCT_ID INTEGER
STORE_ID INTEGER
DATE_ID INTEGER
ITEMS_SOLD INTEGER
SALES_AMOUNT FLOAT
DIM_STORE
STORE_ID INTEGER
STORE_DESC VARCHAR(50)
REGION_ID INTEGER
REGION_NAME VARCHAR(50)
CREATED DATE

DASHBOARD


GB Gringhahns Bank | Real Time Insurance Call Centre
Next full update 38 Seconds
5/27/2015 10:28:29
TOTAL PREMIUM SOLD
Today 12
MTD 246
TOP 5 AGENTS
Monthly
#1 Tania Woo
#2 Scott Bailey
#3 Tony Parappa
#4 Daiya Abram
#5 Mark Chan
IN-BOUND CLOSE RATE (%)
Daily 28
Monthly 34
OUT-BOUND CLOSE RATE (%)
Daily 5
Monthly 6
CALLS HANDLED
Leading Agent 45 (+6)
Leading Prequalifier 20 (+1)
CALLS TRANSFERRED
MTD : 1,275
ABANDON RATE
Good Bad Goal
SCHEDULED LEADS
23
IN-BOUND CALLS IN QUEUE
38
AVERAGE SPEED OF ANSWER
Realtime Speed of Answer Speed of Answer SLA
Answer Duration
CALL ME NOW
Realtime SLA Violation
MTD
CALL ME LATER
Realtime SLA Violation
MTD
'Call Center Insight' has improved its customer experience with help from Dundas Data Visualization. Research f

DASHBOARD


Actual vs Forecast Financial Dashboard
Last 12 Month
Revenue
Actual
$1,322,949
Forecast
$1,375,443
Δ Absolut
$-52,494
Δ Percentage
-3.82%
Actual
Forecast
Costs
Actual
$1,260,564
Forecast
$1,279,821
Δ Absolut
$-19,257
Δ Percentage
-1.50%
Actual
Forecast
Net Profit
Actual
$62,385
Forecast
$95,622
Δ Absolut
$-33,237
Δ Percentage
-34.76%
Actual
Forecast
Revenue
$175k
$150k
$125k
$100k
$75k
$50k
$25k
$0k
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022
Mar 2022
Apr 2022
May 2022
Jun 2022
Actual
Forecast
Breakdown of Costs
COGS
Sales
Marketing
General & Admin
Other Expanses
Taxes
$0K
$100K
$200K
$300K
$400K
Actual
Forecast

Microsoft edunet foundation SAP TAMIL NADU SKILL DEVELOPMENT CORPORATION SKILLS FOR PROGRESS AND PROSPERITY

CONCLUSION

In conclusion the real time analysis of bank customers revealed valuable insights into the behaviours and preferences. Through continuous monitoring and analysis, we identified patterns in transactions volumes, peak hours, preferred channels, and customer demographics. These insights enable the bank to optimise resource allocation, tailor marketing strategies, and enhance customer experiences. Recommendations include implementing personalised marketing campaigns, improving digital banking services, and offering targeted promotions to segments with specific needs. By leveraging real -time data analytics, the bank can stay competitive, adapt to evolving customer demands, and foster long-term relationships with its customers.

FUTURE SCOPE

Improving products and services through big data. Building a great experience is already the main focus of big data research for 65% of bank executives. This is in large part because banks are up to 70% more likely to sell services to existing clients and big data can be the key to unlocking its potential. The future scope of real-time analysis of bank customers is characterised by continuous innovation driven by advances in technology, data analytics, and customer-centricity. By embracing these opportunities, banks can unlock new levels of efficiency, competitiveness, and customer value in the digital age.