Advanced Analytics

Case Studies

Advanced Analytics
Cross-Sell/Up-Sell/What-If Analysis

Request and Guidelines Provided

- Consolidate product level sales data across channels (company website, e-commerce sites, white labeling, etc.) into a central repository

- Perform advance analysis to identify areas through which sales can be improved,
  - Cross-Sell and Up-Sell analysis

- Create a report on periodic basis to identify missed opportunity for us to test the analysis and hypothesis for a pilot geography

Methodology and Final Deliverable

- Built a data pipeline to gather, standardize and store product level sales data across multiple channels into a central repository

- Performed market basket analysis to identify product association and based on business logic and threshold score identified Cross-Selling opportunities

- Performed RFM analysis and identified broader segments based of products to generate targeted marketing campaign for Up-Selling products

- Developed a What-if analysis model for marketing spend vs sales to test the hypothesis and plan future budgeting accordingly

Market Basket Analysis

Order	Item	Metrics	Recommendation (Highest Confidence)	Recommendation (2nd Highest Confidence)	Recommendation (3rd Highest Confidence)
	Nutrition 101		Christine	L.A. Confidential	Mulan
	The African Queen		Christine	L.A. Confidential	Mulan
	Dracula		Christine	L.A. Confidential	Mulan
10438	And Out Come Wolves		Christine	L.A. Confidential	Mulan
	Best of Disney Volume 2		Christine	L.A. Confidential	Mulan
	98 Degrees & Rising		Christine	L.A. Confidential	Mulan
	Never Say Never		Christine	L.A. Confidential	Mulan
11594	L.A. Confidential		Wall Street	Christine	Dr. Dolittle
11696	50 Favorite Rooms		I Know What You Did Last Summer	The Wedding Singer	9 Steps to Financial Freedom
	Ferris Bueller's Day Off		I Know What You Did Last Summer	The Wedding Singer	9 Steps to Financial Freedom

RFM Analysis

Frequency per month	R Rank	F Rank	M Rank	R	F	M	RFM Score	Cluster		R Rank	F Rank	M Rank	RFM Score
0.22	1258	2489	2329	2	4	4	244			2719	2647	2720	5
0.36	2638	3198	3253	4	5	5	455			2041	2020	2042	4
0.40	3164	3216	3345	5	5	5	555			1359	1317	1361	3
0.42	2602	3298	3344	4	5	5	455			680	642	681	2
0.29	2782	2872	2991	5	5	5	555			1	1	1	1
0.10	1165	827	500	2	2	1	221						
0.13	1550	1317	1473	3	3	3	333						
0.25	1733	2647	2379	3	5	4	354		RFM Segment	Count			
0.14	2969	1484	1990	5	3	3	533		111	391			
0.17	3370	1885	1538	5	3	3	533		121	42			
0.29	2648	2872	3031	4	5	5	455		131	0			
0.26	2920	2802	2423	5	5	4	554		141	0			
0.29	1691	2872	2583	3	5	4	354		151	0			
0.08	1647	642	810	3	2	2	322		211	84			

What-If Analysis

Sales 2015	$ 980,000.00
Growth 2016	5%
Expenses 2016	15%
Projected Sales 2016	$ 882,000.00

		Possible Expense Growth					
	$ 882,000.00	10%	15%	20%	25%	30%	35%
Possible Sales Growth	1%	$891,800.00	$842,800.00	$793,800.00	$744,800.00	$695,800.00	$646,800.00
	2%	$901,600.00	$852,600.00	$803,600.00	$754,600.00	$705,600.00	$656,600.00
	3%	$911,400.00	$862,400.00	$813,400.00	$764,400.00	$715,400.00	$666,400.00
	4%	$921,200.00	$872,200.00	$823,200.00	$774,200.00	$725,200.00	$676,200.00
	5%	$931,000.00	$882,000.00	$833,000.00	$784,000.00	$735,000.00	$686,000.00
	6%	$940,800.00	$891,800.00	$842,800.00	$793,800.00	$744,800.00	$695,800.00
	7%	$950,600.00	$901,600.00	$852,600.00	$803,600.00	$754,600.00	$705,600.00
	8%	$960,400.00	$911,400.00	$862,400.00	$813,400.00	$764,400.00	$715,400.00

Advance analytics helped identify new avenues to increase sales and budget accordingly for the future
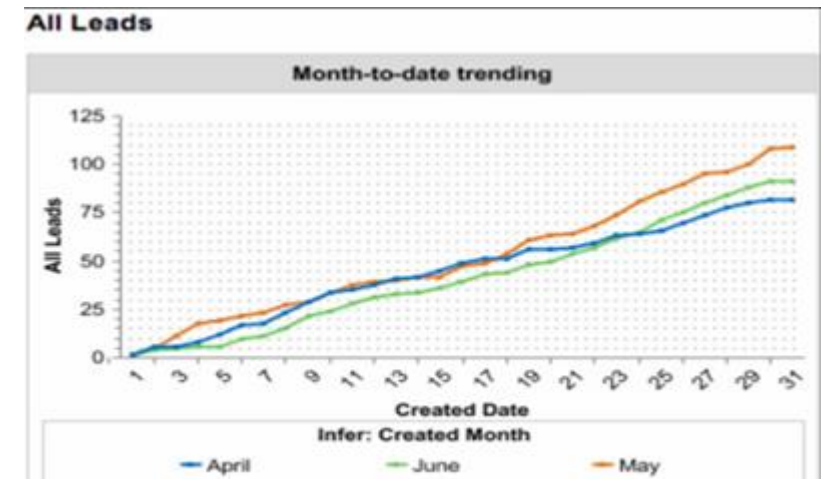
Advanced Analytics
Customer Targeting using Predictive and Text Analytics

Request and Guidelines Provided

- Client: A market leader in the Indian time-share hospitality domain

- Build a predictive lead scoring model for lead prioritization and improve the sales conversion

- Evaluate campaigns' effectiveness based on the leads and sales generated

Methodology and Final Deliverable

- Using multiple attributes, built a predictive lead scoring model that combined different algorithms

- Back-tested the results with the historical data to validate the hypothesis and model's effectiveness

- Back-tested the model performance on past campaigns to identify top and bottom performing campaigns

Tools/Technology used: R, MS Excel
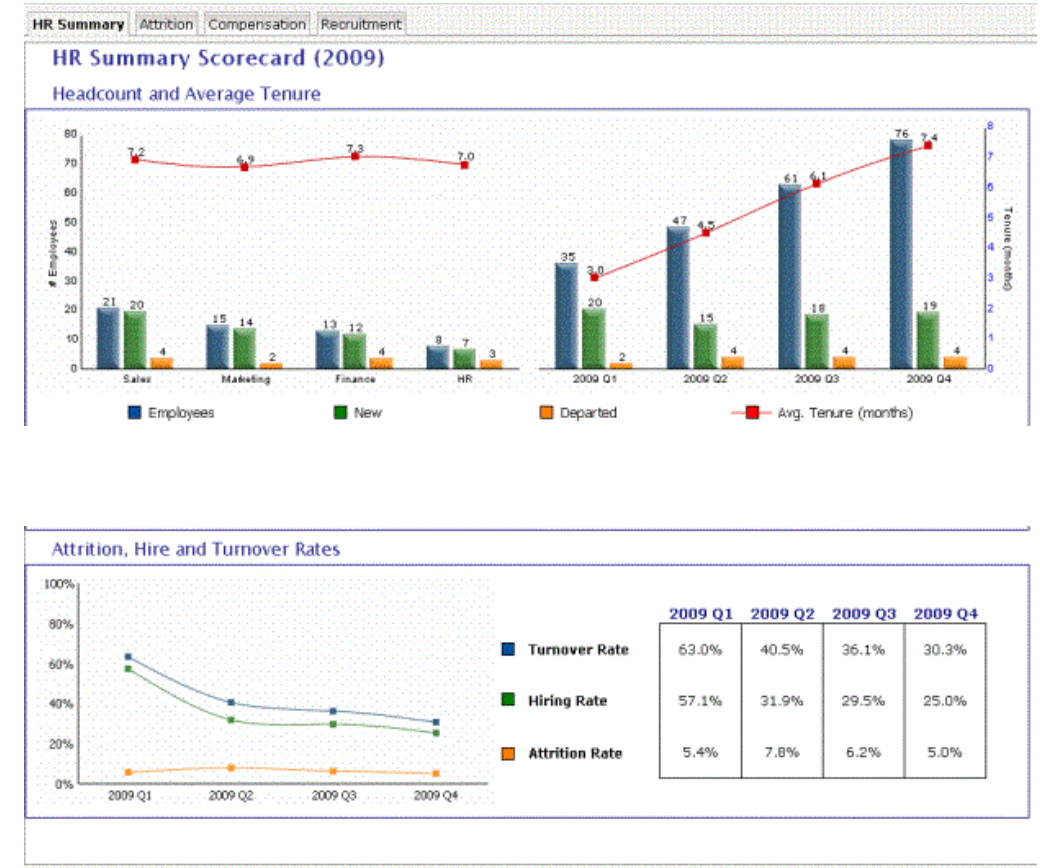
Advanced Analytics
Churn Prediction

Request and Guidelines Provided

- Client: A global private equity firm managing over $7bn in assets

- Facilitate tracking and monitoring of attrition across the firm

- Evaluate departments on relevant attrition KPIs over the years and flag high-attrition departments

Methodology and Final Deliverable

- Cleaned and consolidated attrition data to enable easy calculation of the metrics

- Created a wireframe for the layout in consultation with the client and created the dashboard in Tableau

- Scheduled periodic data refreshes to provide up-to-date information on the dashboard

- Dashboard simplifies identification of the problem areas and enables corrective actions

Tools/Technology used: Tableau, MS Excel
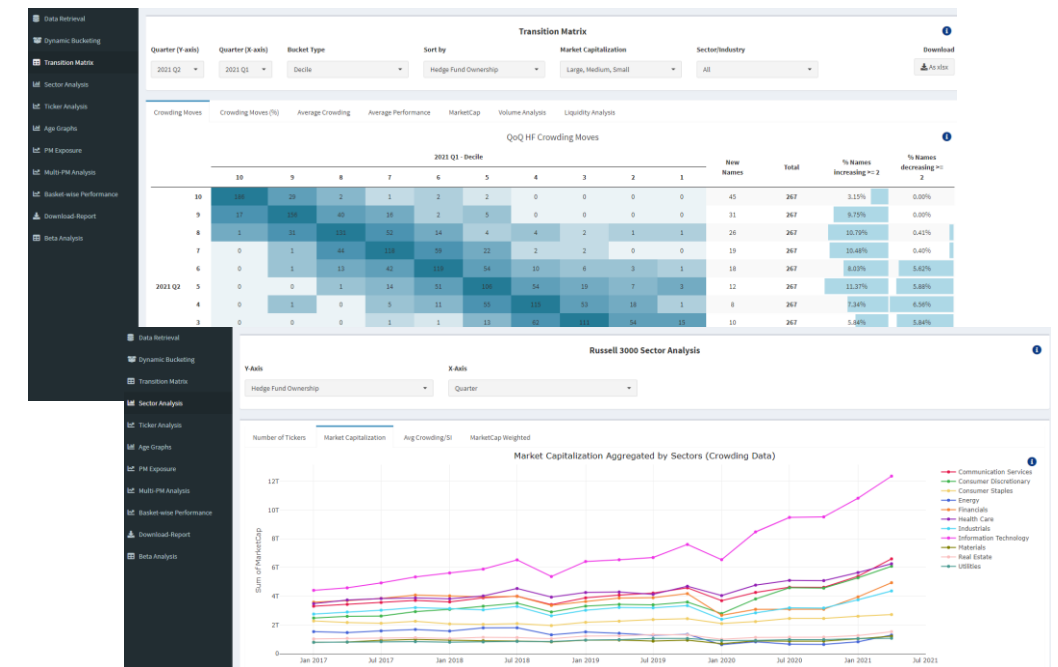
Advanced Analytics
Competitor Benchmarking

Request and Guidelines Provided

- Create a web-based application that can:
  - Leverage company wide as well as alternative datasets to track portfolio performance, risk, exposure, and liquidity
  - Visualize trends, KPIs and metrics pertaining to the investment strategies
  - Generate periodic fund level performance reports and provide individual access and views to different users

Methodology and Final Deliverable

- **Sourcing**: Automated ETL process was designed in R to consolidate and standardize data from multiple sources into a data repository

- **Storage**: Designed SQLite database with multiple triggers and stored procedures

- **Governance**: Deployed multiple flagging algorithms to ensure data quality to avoid duplications/anomalies; also implemented MDM and designed user-specific access controls

- **Engineering**: Coded custom business rules that handle the transformation of data between a database and visualization interface using RShiny

- **Analysis & Reporting**: Created a RShiny web application to track portfolio based KPIs and added periodic reporting functionality based on user defined multiple filters

Designed an interactive R Shiny web application for performing portfolio analytics and competitor benchmarking

Advanced Analytics
Fraud Prevention and Investigation (FP&I)

Request and Guidelines Provided

- Client: Leading providers of Mobile Banking Services
- Data is sourced from vendors and other third-party platforms and stored in multiple databases for the different product lines
- Build a Power BI application with a consolidated view for the KPI/KRI metrics relevant to the FP&I domain
- Design alert mechanisms to help them place necessary controls basis the account activity of a user
- Analyze the impact of various actions at timely intervals to increase profitability
- Prepare a staffing model to ensure proper investigation for the disputes in the required timeframe to avoid regulatory violations

Methodology and Final Deliverable

- Based on client discussions, understand the various data sources and how they are linked with each other
- Started with a consolidated dashboard containing 68 FP&I data points and their trend over the years
  - Designed python scripts and SQL queries to source the data and the feed them into Power BI dashboards
- Used python and Power Automate flows to automate sending of alerts and paginated reports exported from Power BI
- Designed a flow to pull the daily data for disputes assigned to each team member and calculate the necessary metrics to analyse performance
- Source the data from third party tools to prepare weekly reports for partner banks
- Ad-hoc analysis based on specific events that might increase loss exposure

Tools/Technology used: Teradata SQL, SQL Server, Python, Excel, Power BI, Power Automate

Advanced Analytics
Fraud Prevention and Investigation (FP&I)
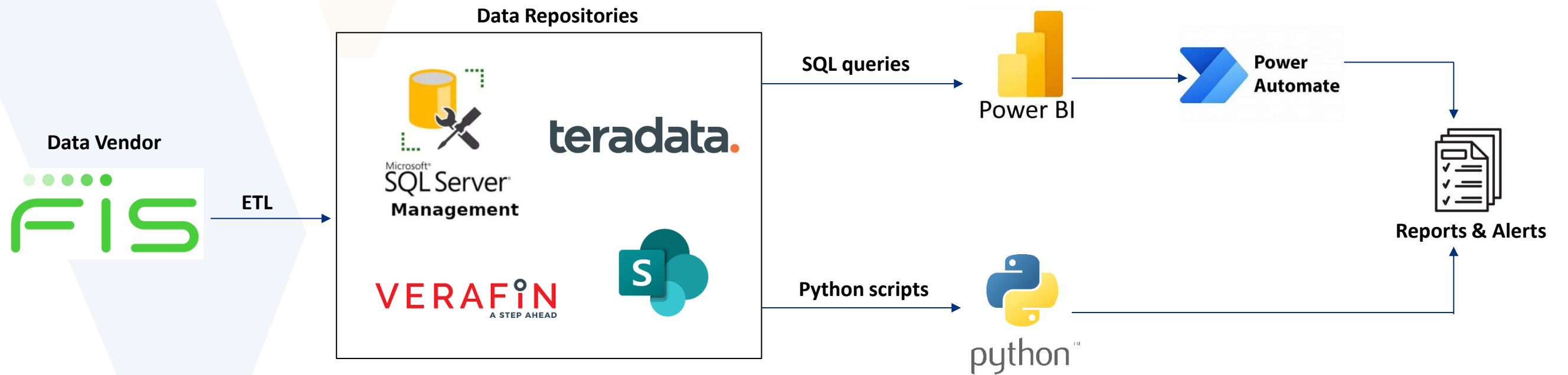
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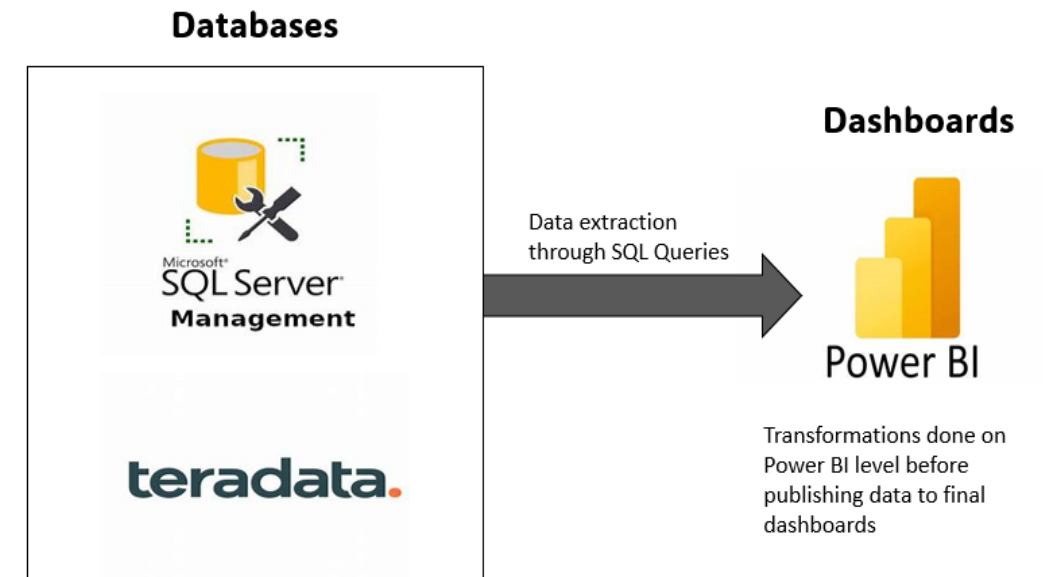
Advanced Analytics
Marketing & Product Analytics

Request and Guidelines Provided

- Client: Leading providers of Mobile Banking Services

- Data is stored across multiple platforms and databases, depending on specific products and campaigns
  - Hold information regarding customer & partner demographics, account level information, transactions, activity etc

- Develop a Power BI application that consolidates various data points for each product
  - This application will serve the marketing and product teams by capturing essential information, including - customer acquisition, activity, trends in sales, balance, transactions across last few years
  - Additionally, the app should highlight significant trends related to specific marketing campaigns which can be used to perform BI and Analytics

Methodology and Final Deliverable

- After discussions held with the clients, data points to be calculated were collected

- In the data exploration phase, we spent time locating the required tables, identifying patterns and understanding relationships within the dataset

- Developed python scripts and queries to extract relevant data from databases, aligning with the specific business requirements and automate the flow

- Developed a Power BI app comprising 12 different dashboards and around 40 data points
  - Loaded the extracted data queries into Power BI
  - Applied essential transformations to highlight relevant insights related to distinct products

Databases

Microsoft® SQL Server Management

teradata.

Data extraction through SQL Queries

Dashboards

Power BI

Transformations done on Power BI level before publishing data to final dashboards

Tools/Technology used: SQL, Teradata, SSMS, Python, Power BI

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