



Enterprise Solution

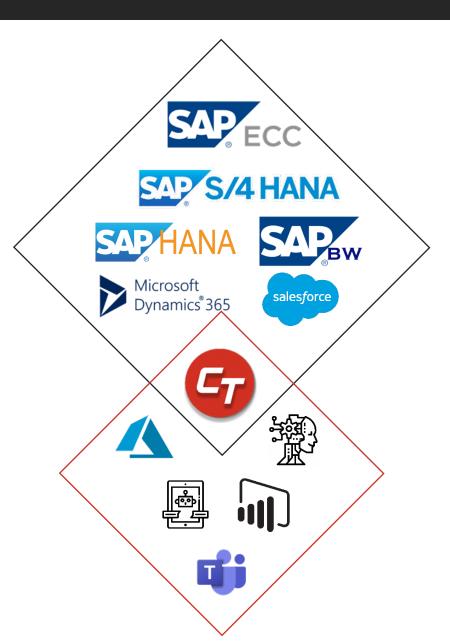






Celebal Technologies – Traditional Enterprise + Modern Cloud









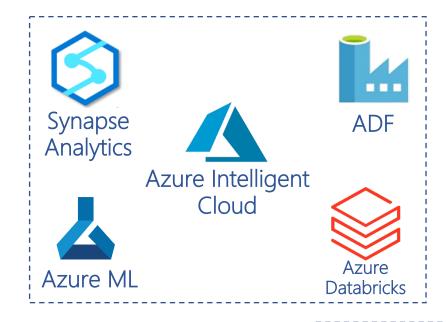






The Complete Cloud – Productivity, Apps, Hosting & Analytics











Leadership





Anupam Gupta, Co-founder, Head of US Operations

Anupam brings in 21 years of Development and Global Consulting experience with Enterprise Software Solutions. He has been advising customers on Enterprise strategy and Technology Road maps. He Holds a B.Tech from IIT Bombay



Anirudh Kala, Co-founder, Director, Chief Data Scientist

Anirudh is an expert in Machine Learning techniques, Artificial Intelligence and Natural Language Processing using Azure and Cortana Services. He has led Al ML COE for various organization throughout the globe.



Saurabh Daga, Supply Chain and Manufacturing, Principal

Saurabh has been a Supply chain Guru and has helped multiple Fortune 500 companies such as Samsung , Lenovo, etc. He has been a pioneer of designing and implementing Supply chain Systems in Manufacturing and Retail.



Dinesh Thawani, Principal

Dinesh has 20+ years of experience in delivering Enterprise Solutions and has led multiple practises in various disciplines of Computer Science. He is a fellow from Tata Institute of Fundamental Research.



Anish Ashirgade, Head Celebal Tech. Singapore

Anish has 20+ years of experience in SAP Analytics with expertise enterprise in Automation. Currently he leads the SAP practise for Celebal Asia pacific region and is based out of Singapore



Abhishek Goyal, Solutions Sales Principal

Abhishek brings in about 20 years of Sales and Marketing experience across Industry domains. Having a keen Engineering interest and background empowers Abhishek in Technology Solution Sales and Services.



Mukul Biswas, Head Celebal Tech. UK

Mukul has 22+ years of experience in SAP and has led large practises of SAP analytics and Implementation for Global SI around the world. Mukul holds a B Tech from IIT Delhi

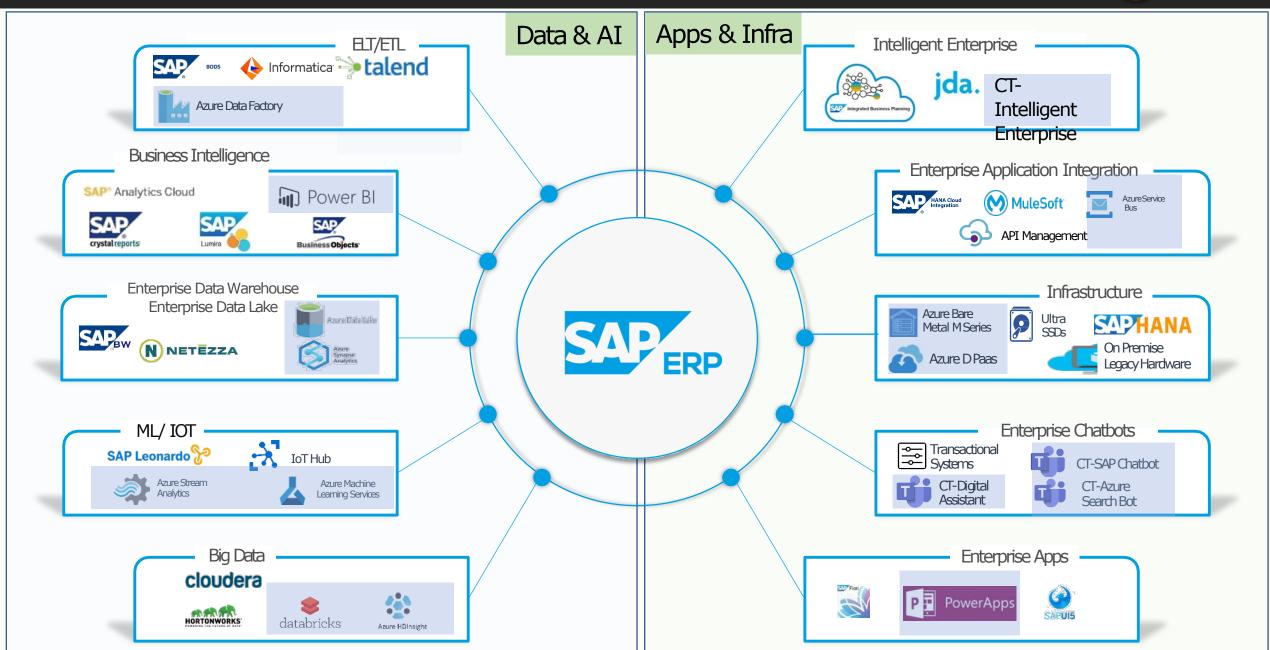


Jon Myklebust - Strategic Advisor

Jon has been a Senior IT executive at Fortune 500 companies such as The Walt Disney Company (Technical Project Manager – IT Strategic Planning), Warner Bros. (VP of BI and DW) and Sony Pictures (VP of SAP).

SAP Surround on Azure





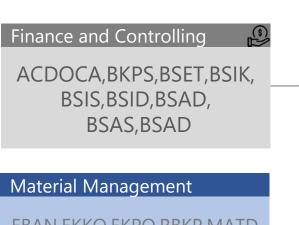
Azure Innovations in SAP





Data Foundation Layer

Business KPIS



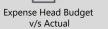












Turnover







Revenue and

EBAN, EKKO, EKPO, RBKP, MATD OC, MKPF, MARA, MAKT, LF1





Spend Analysis



Vendor **Evaluation**

Material Management



Vendor Material Price Variance



Vendor Performance



Purchase Order Cycle time

Sales and Distribution

VBAK, VBAP, VBRK, VBRP, LIKP, LI PS,KNA

Sales and Distribution



Sales Overview



Overview



Delivery Details

Sales and Distribution









Billing Months Analysis Average Revenue Per Unit



Sales Target v/s Actuals



Product Planning

AFKO, AFPO, PLKO, PLPO, A **UFK,JEST**

Product Planning



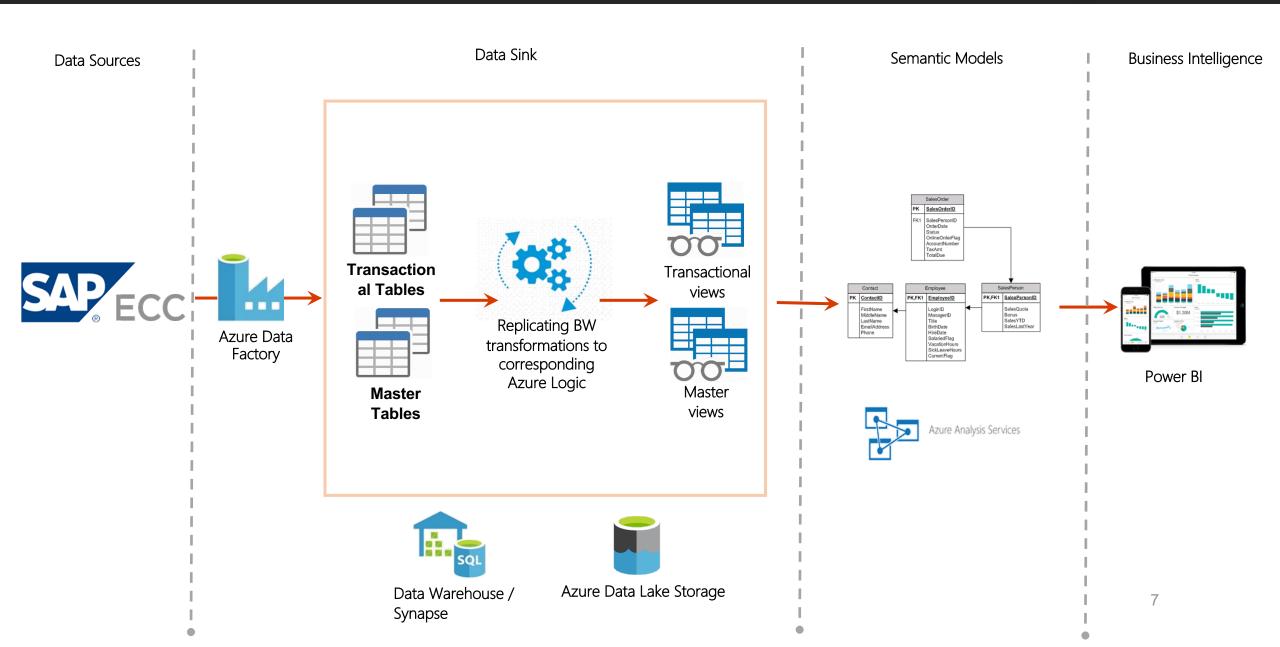
Production Overview

Product Planning



Functional Flow



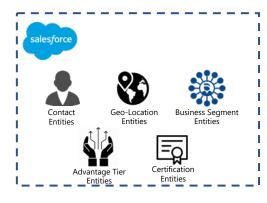


Detailed Flow



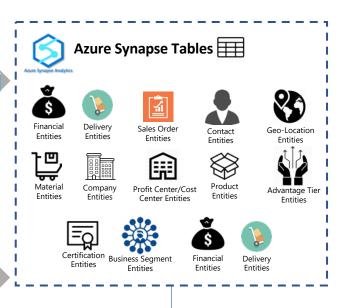
Entities from Data Sources







Entities in Destination and Transformation Layer



pose Value Fields */ ECLARE OtransposeSQL NVARCHAR(HAX)

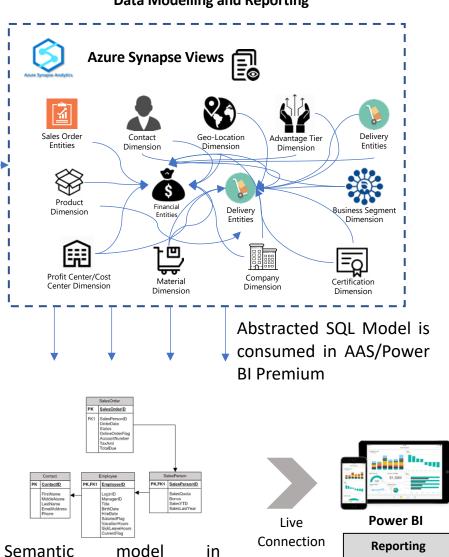
FROM #CE118US_TEMP) AS co

) AS H WHERE H.ColumnValue \leftrightarrow 0 AND VMGAR \leftrightarrow char(65) RINT('Oeclaring Transpose Query')

TerrasposeSQL = N' SELECT LZBatchID, ADLSBatchID, ADLSTimestamp, MANDT, PALEDGER, CURTP, GDAHR, FADAT, BUDAT, KRIDNR, ARTHR, FRART, FRIAZE, KURSF, KAUFN, KDPOS, BUKRS, KOKRS, WERKS, GSBER, VKORG, VTWEG, SPART, H

PLIKZ, KSTAR, REELN, RPOSN, PRCTR, TIMESTYP, KIDGEP, KURNE, KURNE, LUNDS, PSTYV, VKBUR, NACH2, NASIZ, COPA_KOSTL, PROSN, VKGRP, NARED, NAGEZ, MAFTI, WAFT4, WAFT5, ABSMG, ERLOS, Col AS ValueField, Column Transformations such as GIAHR, FADAT, BUDAT, KNOWR, ARTHR, FKART, FRUIE, KURSF, PLIXZ, KSTAR, RBELN, RPOSN, PRCTR, TIMESTMP, KDGRP, KUNRE, K Unpivot, Sign-flip WWFT1, WWFT4, WWFT5, 485MG, ERLOS, ' + @valueFieldList value fields, Updating the ColumnValue FOR Col IN (' + BvalueFieldList + ') reporting channel, populating the missing cost element, fixing the product hierarch

Data Modelling and Reporting

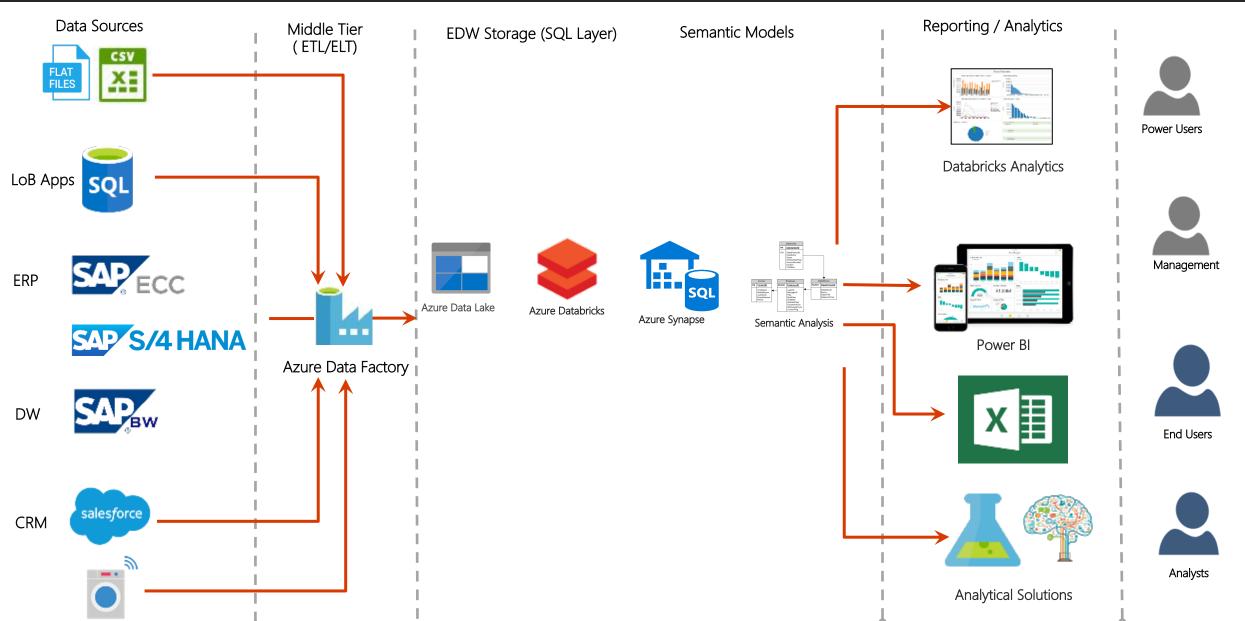


AAS/Power BI Premium for

in-memory caching

Enterprise Architecture- Data Lake





Intelligent Enterprise – Our offering





SAP Data Lake/ Data Warehouse on Synapse



Intelligent
Demand Sensing



Trade Promotion
Offer Analytics



Integrated Forecasting and Replenishment



Inventory Optimization and Management



Route Optimization



S&OP on Power Bl



Intelligent Territory Engagement



Customer Insights



Product to Product Cannibalization



Constraint Based Optimization

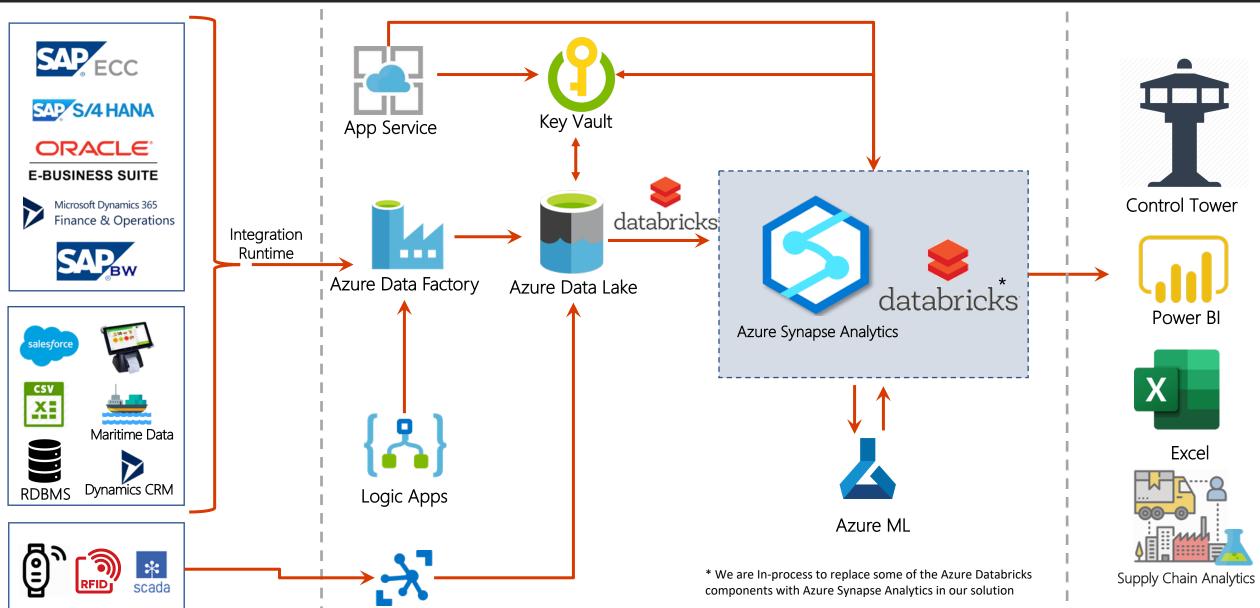


Pricing Analytics

Intelligent Enterprise Architecture

IoT Hub



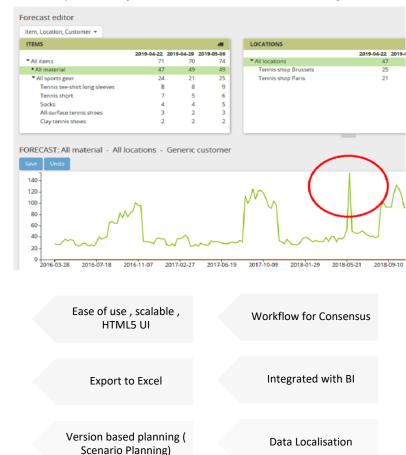


Demand Planning



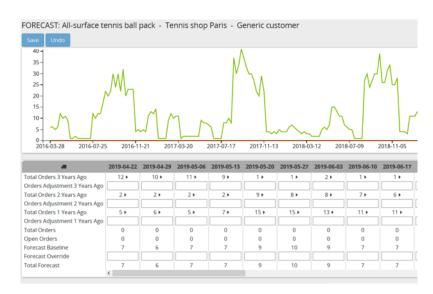
ML powered data cleansing

- Advance anomaly detection algorithms
- Define a maximum deviation.
- Quickly identify exceptions and outliers.
- Improve your forecast accuracy.



ML Powered Forecasting

- Forecast using the cutting edge Deep Learning algos.
- Leading indicators based forecast adjustments.
- Work in teams with sales and planners.
- Pick up your forecasting method.



Tuning and Productionizing

- Minimize forecast errors
- Product Mix Plans
- Estimate future sales.
- Foresee your stocks' volume.
- Anticipate your supply needs.

Forecast report		
SAVE UNDO		
Item	Location	2019-02-25 2019-03-25 2019-04-22 2019-05-20 2019-06-17 2019-07-15
All-surface tennis ball pack ▶	Tennis shop Brussels ▶	29
All-surface tennis ball pack ▶	Tennis shop Paris ▶	39
All-surface tennis shoes ▶	Tennis shop Brussels ▶	
All-surface tennis shoes ▶	Tennis shop Paris ▶	
Clay tennis ball pack ▶	Tennis shop Brussels ▶	
Clay tennis ball pack ▶	Tennis shop Paris ▶	

Demand Sensing





Search:

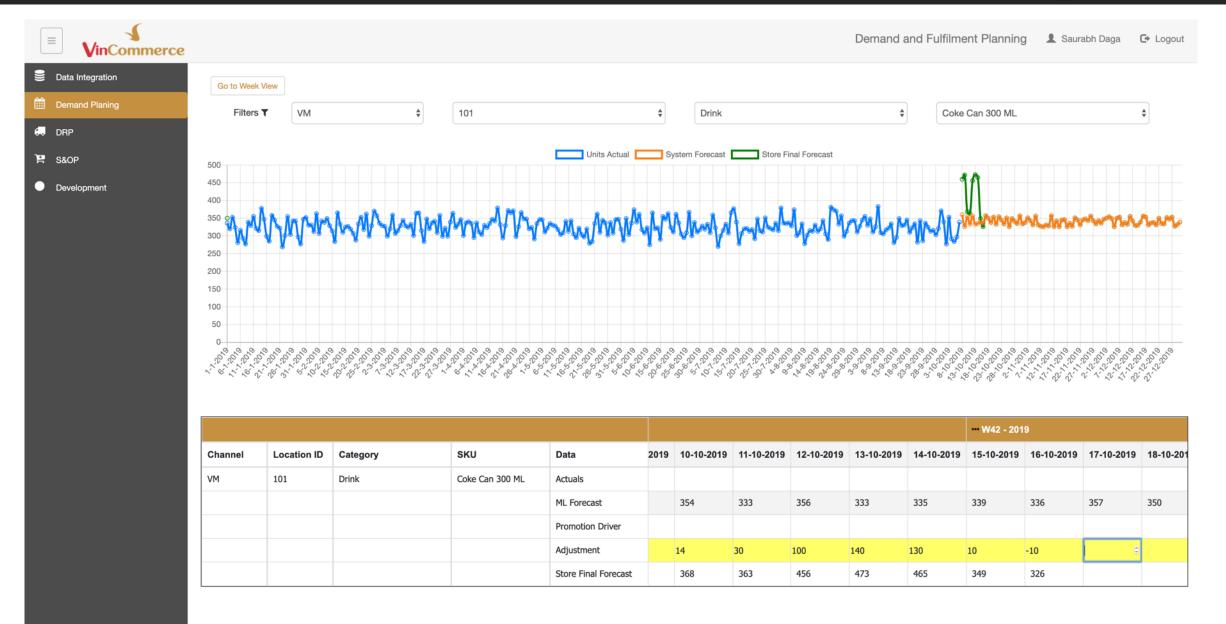
Demand Sen	ısing			
Show 10 \$	entries			

Action	Store	Category	Units Last Week (LW)		Forecast Accuracy			Forecast Drivers				
			Actuals	Gap	Forecast LC	Forecast Accuracy Avg(3 Month)	R/Y/G	Status	Supply Constraints	Initiative Charges	Competitor Actions	External Events
··· 🕞	Vin Mart 1	Drink	1076	1	1075	67.74%	☆	P Open	0	Ø	0	0
··· (Food	1069	25	1044	59.08%	*	Copen Open		Ø		
··· 🕞		Wash	1070	7	1063	60.18%	1	Copen Open			0	
··· 🕞	Vin Mart 2	Kitchen	1136	17	1119	67.74%	1	P Open	0	⊘	0	Ø
 (Electronic	1203	12	1191	59.08%	*	Copen Open		Ø		
··· 🕞		Food	1124	8	1116	60.18%	1	Copen Open	Ø		0	
··· 🕞	Vin Mart+ 1	Drink	1070	1	1071	67.74%	★	Closed	0	0	0	0
··· 🕞		Kitchen	1100	12	1088	59.08%	*	Closed		Ø	Ø	
··· (Wash	1110	2 6	1136	60.18%	★	Copen Open	Ø			
 ⑤	Vin Mart+ 2	Electronic	1167	22	1189	67.74%	★	P Open		0		

Showing 1 to 10 of 15 entries

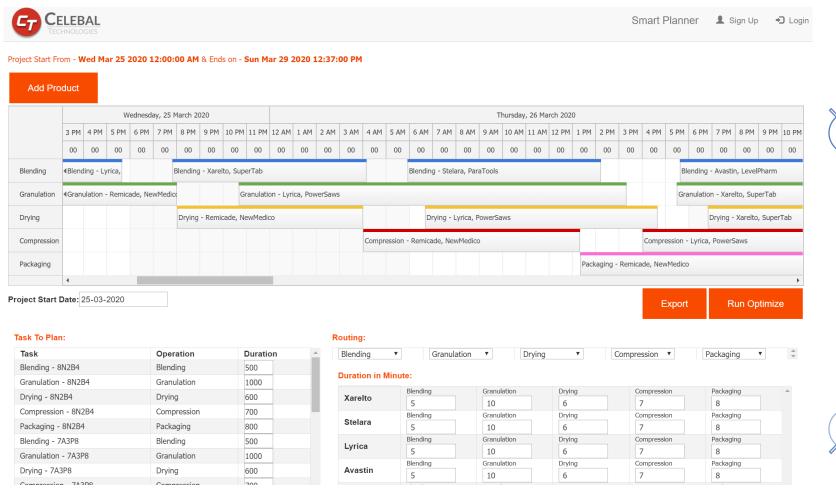
ML Powered Forecasting

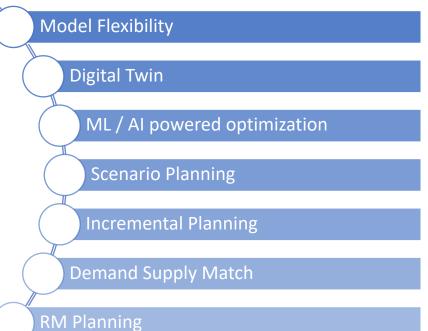




Production Planning & Scheduling







Multi-Echelon Optimized Distribution Plans





DEMAND PRIORITIES
Item A/B/C, store A/B/C,
due date

NETWORK

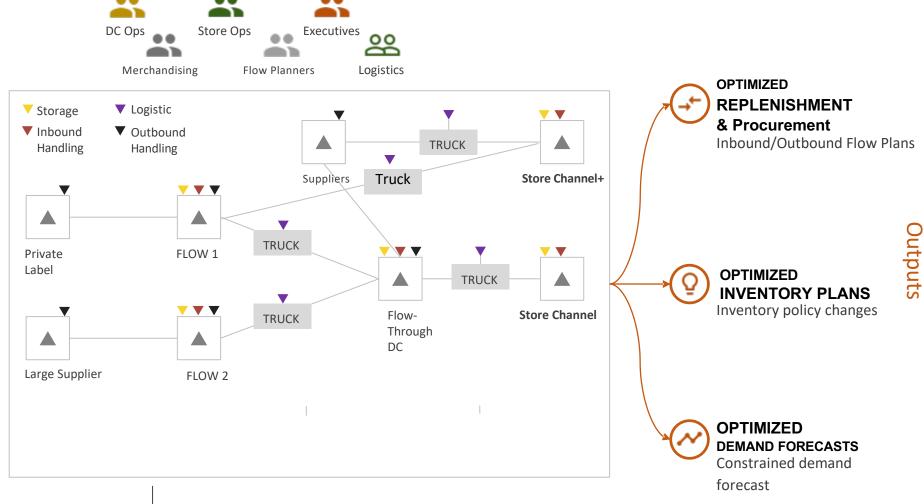
Stores, DCs, Suppliers
Items, hierarchy, BODs, packs

CONSTRAINTS
Storage, handling, transportation

Inputs

PLANNING POLICIES
Inventory targets/bands
Flow policies

INVENTORY
Inventory (on-hand) and open PO's

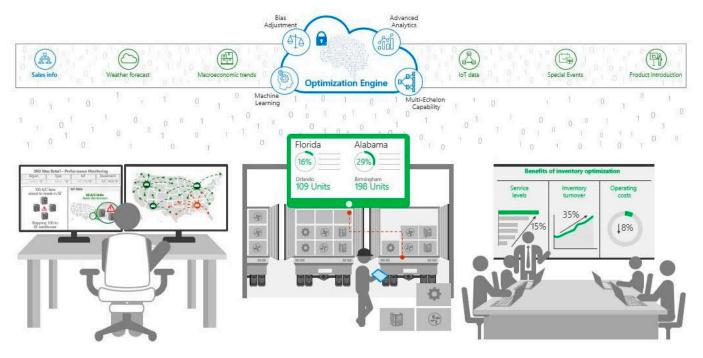


Reporting and Analytics

Store demand fill-rate vs. Service Level analytics
Root cause analysis – Lost Sales, Excess Inventory Reports

Inventory Optimization





True Multi-Echelon Replenishment

Designed for omni-channel retailers and supports any process including vendor-DC-store & vendor-store

Automation frees up your resources

CTs Replenishment solution automatically generates optimal suggested ordering quantities

Flexible Rule Based System

The system accounts for any cost constraints, as well business rules & policies

Intelligently accounts for special events

Suggested order quantities account for effects of events such as promotions, moving holidays, weather triggers, and more.

Powered by Predictive Analytics

CT planning solution is powered by predictive analytics to provide accurate demand forecasts

End-to-End Integration

All CT solutions are fully integrated in a common predictive analytics platform with SAP and Dynamics 360

Demand

Inventory

Production

Logistics

AI/ML Scenarios/Case Studies

Campaign Optimization



Scenario

Predict actions that are expected to maximize the purchase rate of leads targeted by the recommendations to be used by a renewed campaign on:

- 1. How to contact (for example, e-mail, SMS, or cold call)
- 2. When to contact (day of week and time of day) the targeted leads

Algorithm used

Decision Trees



R IDE on Deployed VM
- or Data Scientist
Workstation

Offer Prediction



Scenario

Customer Loyalty Prediction

- Who are the customers that would redeem an offer given to them
- Those who redeem the offer who are likely to be a Repeat Customer

Algorithm Used

Based on Ensemble of Random Forest and SVM



Lead Scoring



Scenario

Algorithm used

- Score Leads according to their chances of becoming potential customers
- Enables targeting campaigns for both OEMs and advertising portals

Based on Light Gradient Boosting Technique



Sentiment Analysis

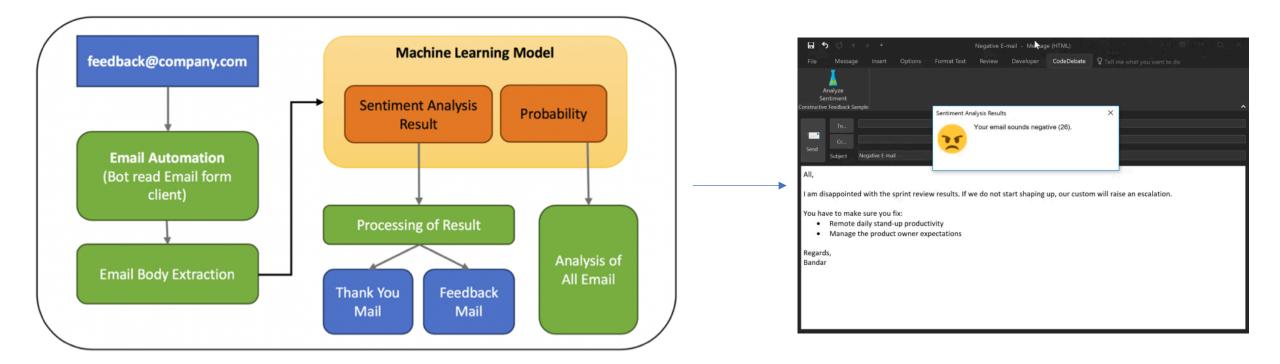


Scenario

Algorithm used

- Categorize user feedbacks collected on Emails , Web-platform into different sentiments
- Enables targeting campaigns basis user Sentiment groups

Word embedding through BERT using Tensorflow



Predict Claim Denials



Scenario

Predict the Denial Reason and Reason Code for insurance claim

Description

Analyzes Historical EOB's, Medical Codes, CARC/RARC codes, Payment patterns, Provider Credentials, Provider -Payer contracts prior to suggesting changes. Few of the data points were: Member ID, Provider ID, Line Of Business, Revenue Code, Service Code, Place Of Service Code, Procedure Code, Diagnosis Code, Claim Charge Amount etc.

Algorithm used

Ensemble of SVM (Radial Basis) and XgBoost



Fraud Detection- Vehicles



Scenario

Predictive models to determine which automobile claims are fraudulent

Description

Claim Amount - Uncommonly high claim amounts are more likely to be fraudulent.

Claim Cause - The more severe claim causes (fire and collision) will be less likely to be fraudulent.

Claim Report Type - Fraud claims will be reported with as little human interaction as possible.

Algorithm used

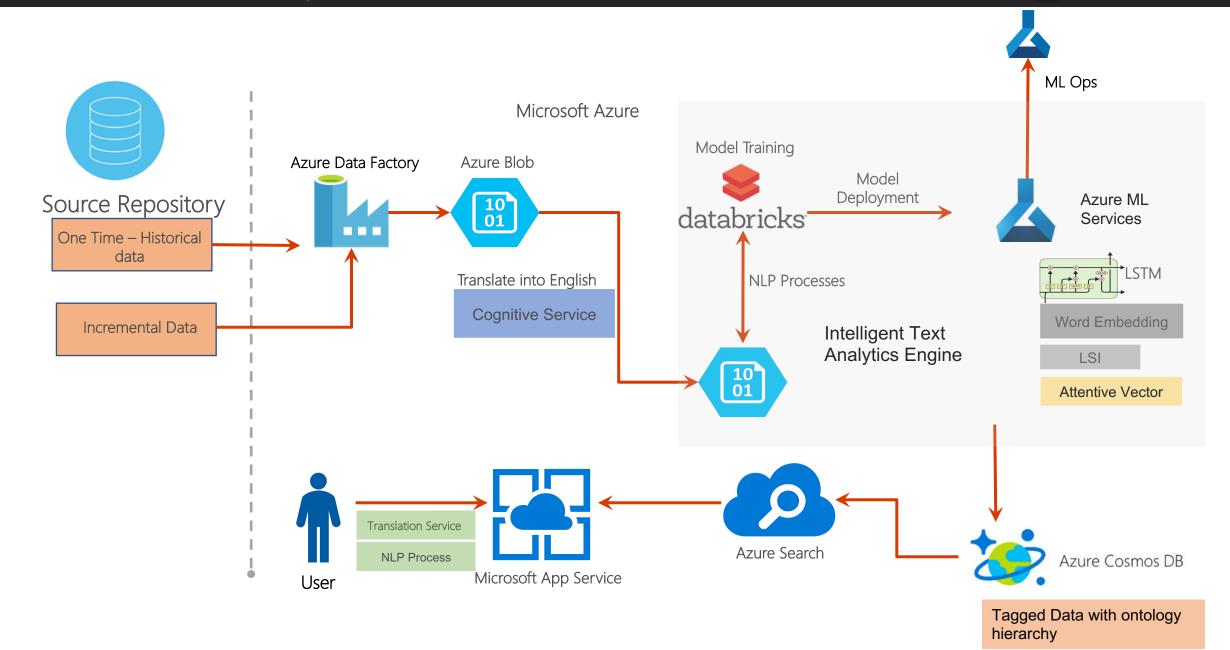
Neural Network with ensemble of Gradient Boosting





Patent Similarity





Improve Quality of Hire



Scenario

Provide a quality of hire rating to each individual candidate appearing for the interview for a position

Description

Based on an ensemble of RF and Adaboost on the Employee Central data



Predict Order Returns



Scenario

Predict the order return probability for Cash On Delivery Orders.

Description

The algorithm is based on recurrent neural network and it would predict that out of all the orders that were booked this week how many of them would be returned



Identify damages using Computer Vision



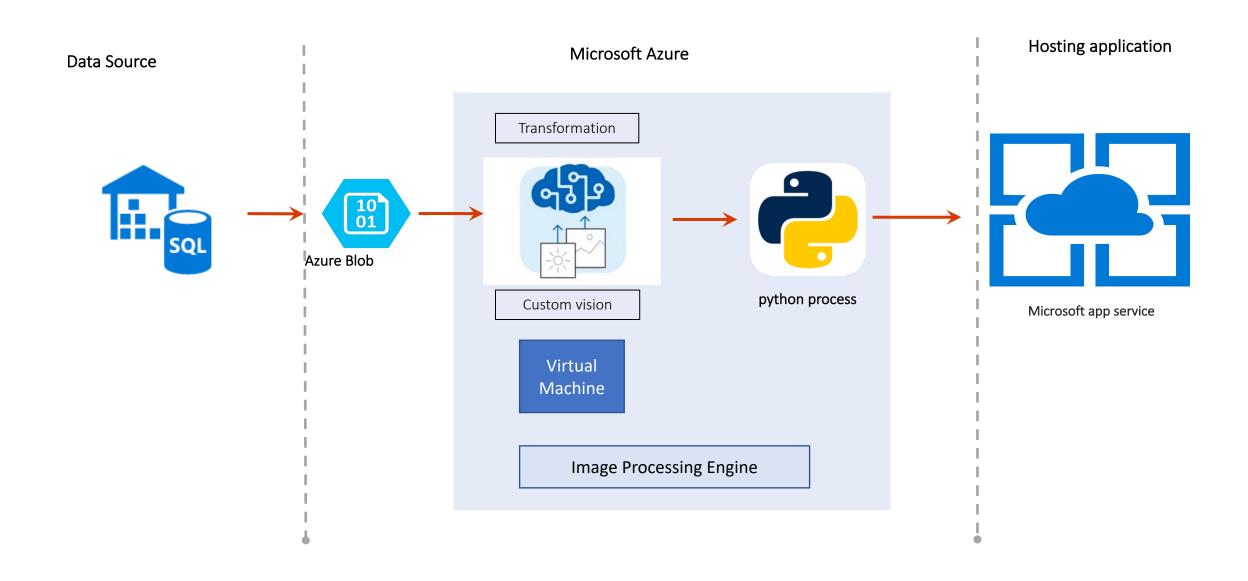
- Find Parts , make , model for a given car
- Identify damages like Dent, Scratch etc.



HOOD ASSY - Dent

Proposed Architecture

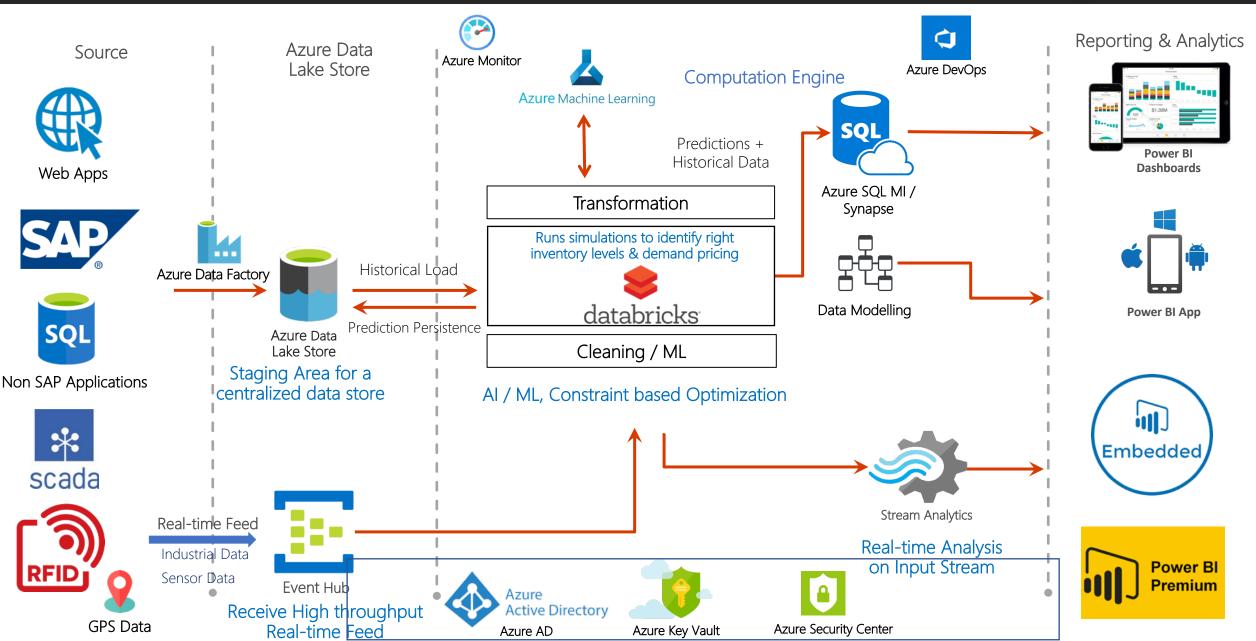




Big Data Implementation

Solution Architecture





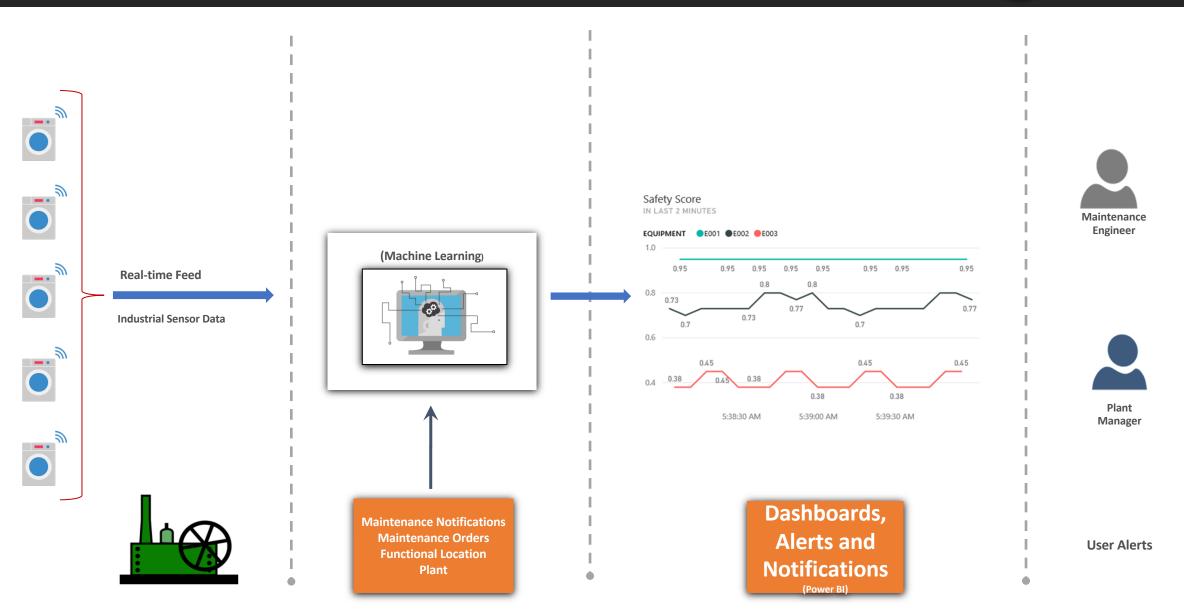
Predictive Maintenance



- Import ERP Maintenance history data into IOT Predictive system
- Use this data to Train a Machine Learning model (using Support Vector algorithm)
- Stream sensor data into this Model to predict safety score
- Visualize streaming data for sensor and scoring information
- Send Maintenance Alerts to responsible users
- Predict failures and take corrective action. Avoid shut-downs.

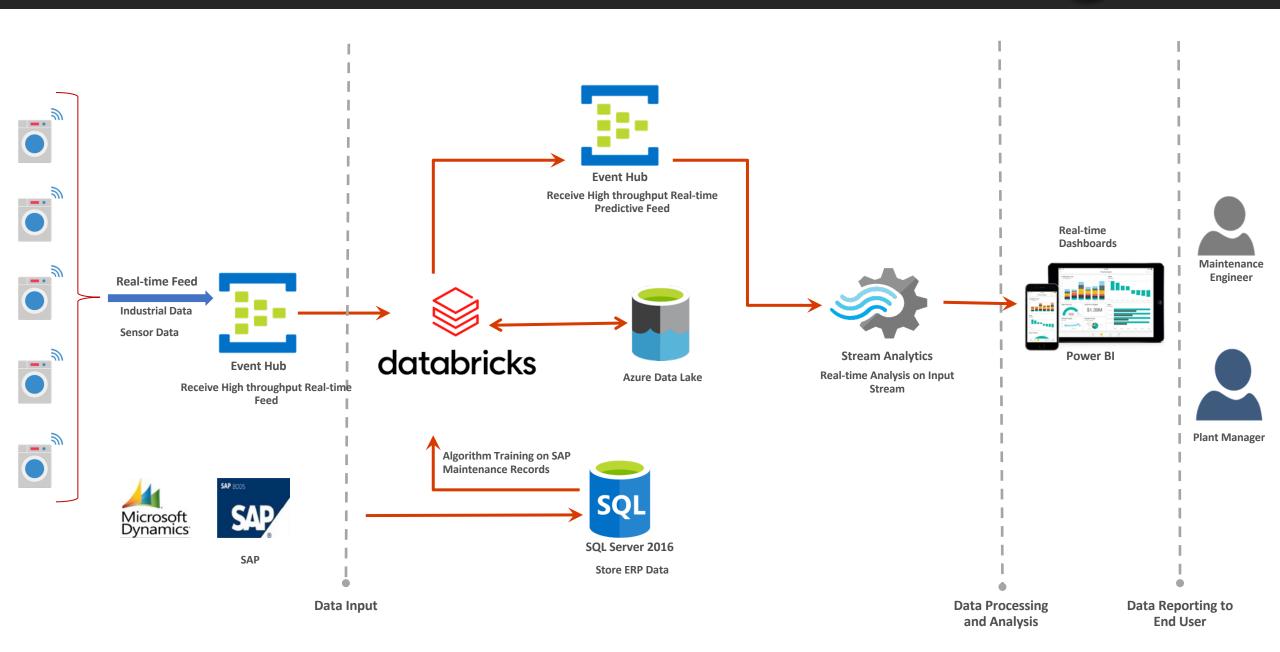
Functional Flow- Predictive Maintenance





Technical Architecture- Predictive Maintenance CELEBAL TECHNOLOGIES





Case Studies – Data Analytics

Sales Forecasting



Business Scenario

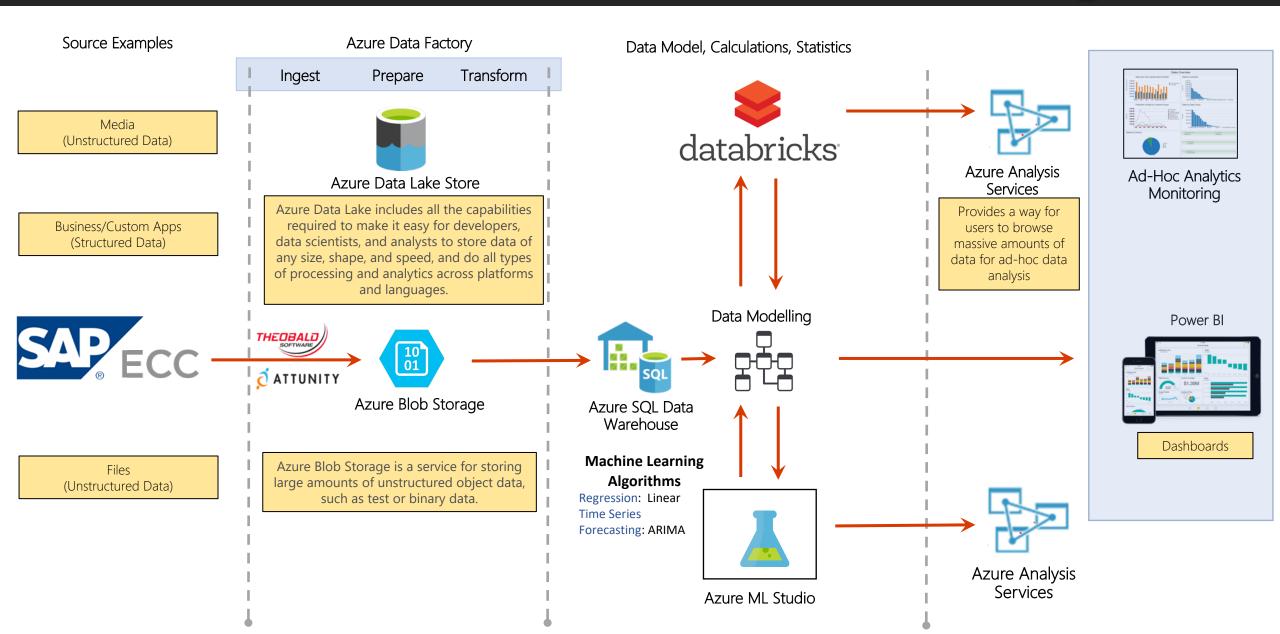
Current process involves silo offline systems for forecasting unorganized implementation of data storage and analytics. Manual Workflow in the whole process and Analytics is done on spreadsheets with limited means of data processing. Solution not integrated and not scalable.

Solution

- Azure SQL acts as Enterprise Data Warehouse. Pulls the current Shipment (Actuals) from SAP ECC
- Pull the data from Azure SQL in Machine Learning / Forecasting System (Azure ML or Databricks)
- Performing data pre-processing and manipulation
- Training the forecasting models with past data
- Forecasting the sales for coming months
- Pushing the data back to SQL
- Visualizing the trends on Power BI

Sales Forecasting- Architecture





Case Study- Chemical Corporate



Business Scenario

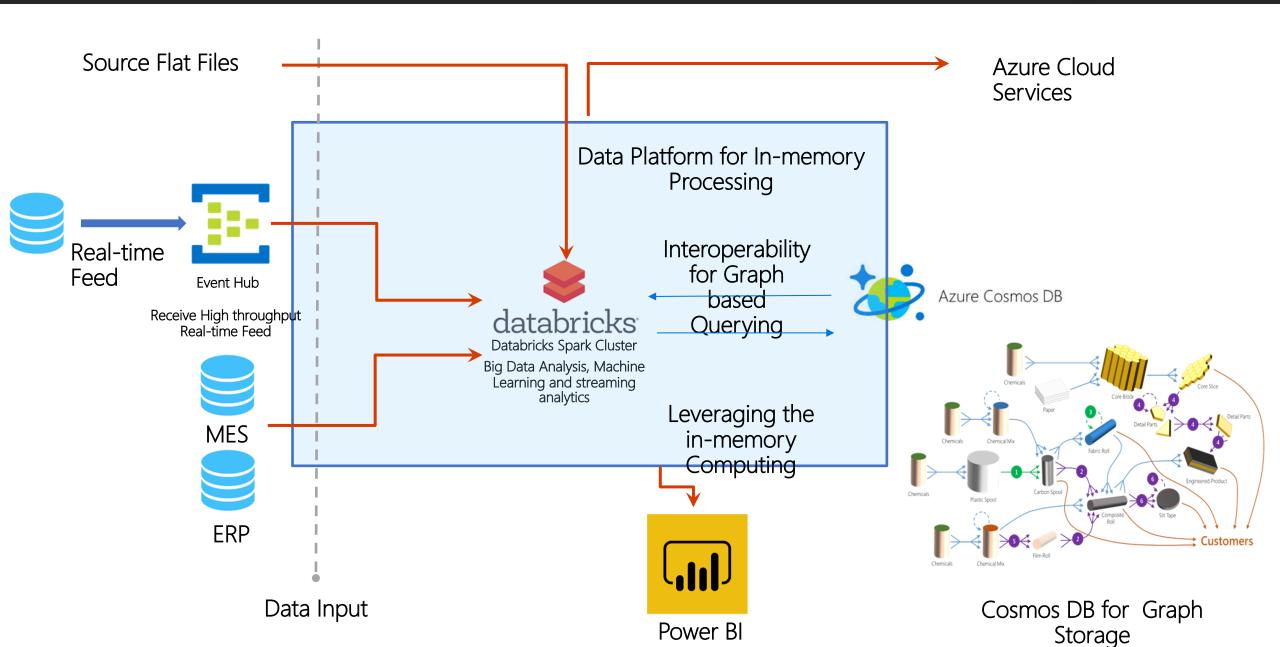
- The chemical corporate firm was facing the issue of chemical composition of mixtures and products and their test results. It was also struggling with the sales data of a particular chemical.
- This scenario is focused on querying data and information for a UK based firm which stores production data in various stages and forms having complex parent child relations.
- The major task was to create metadata and relations in the data such that it could be queried using a graph database without utilizing much of compute power as well within time constraint of 5 seconds.

Technology Solution

- The data from CSV files was imported, cleaned and transformed using Azure Databricks.
- After forming relations, transforming data in form of graph in Azure Databricks we pushed data in Cosmos DB.
- We then queried data and graph using Gramline API of Azure Cosmos graph and answered questions like, "In last year 3 years whom did we sell material to and in what quantity" and "What products contain any chemical X or it's derived chemical and in what quantity".
- Using Azure Databricks Services and Source flat, then interospectiblity with graph based query on Azure Cosmos DB.
- Power BI is used to visualize this real time streaming data for recording and scoring information
- This whole compiling process comes under Azure data services using Azure Databricks.

Technical Architecture- Chemical Corporate





Power BI- Use Cases



Telecom & Manufacturing

- Calculating hidden trends of attritions
- Department wide management of BI portal
- Power BI Embedded Portal to monitor Demurrages, Supply Chain, Port occupancy

Pharma

- Creation of Prediction Model for daily sales data and visualizing on power BI Dashboards
 - Number of drugs to be flagged or to be reviewed
 - Drugs categorized in decile feature
 - Change in Tariff, volume, COGS, margin on the basis of Dashboard filters and ML Algorithm

Finance

- Reporting for Group CEO and Business CFOs
- Mobile Dashboards
- YTD, QTD, MTD comparisons of %Growth and %Achievement
- P&L, Balance Sheet and Sales Reports
- Shared Datasets for Ad hoc report creation capability

Power BI Use Cases



HR

- Capability to plan the Workforce (HR Analytics)
- Yearly spending management
- Calculating Savings based on
 - GeoMix Optimize Hiring
 - Attrition Replacement
 - Bottom 15%
 - Defer Hiring
- What-if Analysis' feature and Complex Measures

Pharma

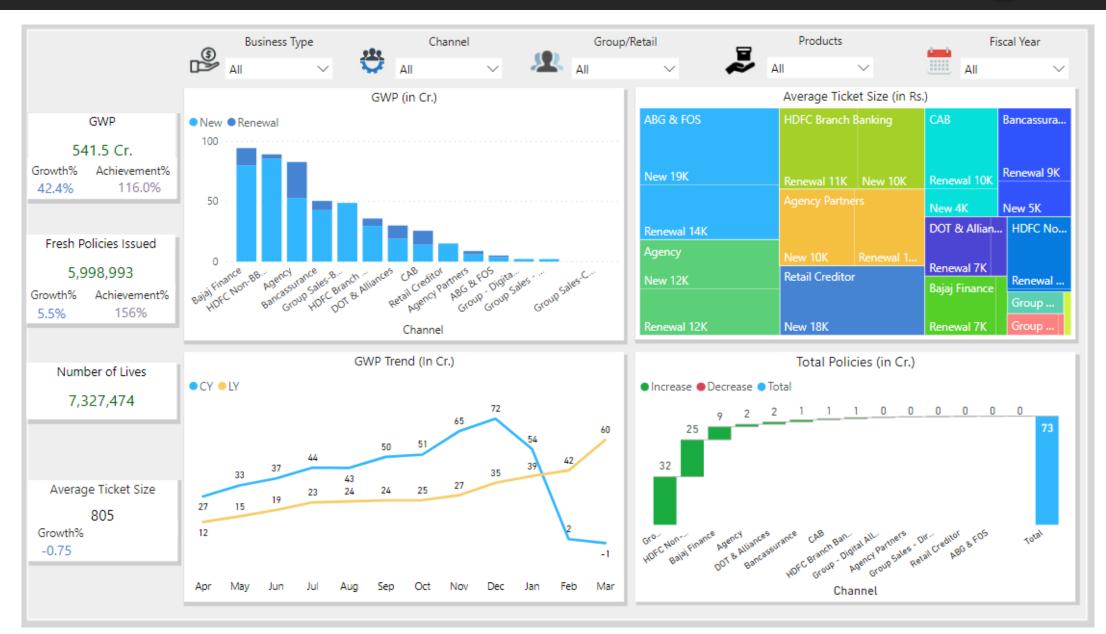
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Manufacturing

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- Power BI Embedded Portal to monitor Demurrages, Supply Chain, Port occupancy

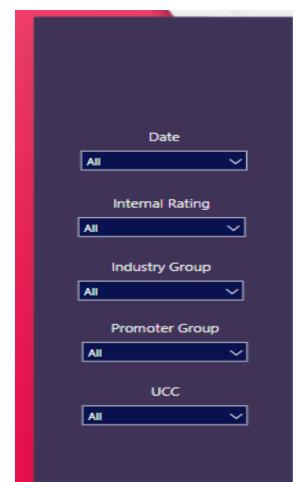
Insurance





Banking





	Inter	nal Rating Wis	e Summary (In Mill	ions)				
Internal Rating (Count of UCC	Fund Exposure	Non Fund Exposure	Fungibilty I	Net Exposure	FB O/s	NFB O/s	Outsta
⊕ AA+	1	1.7	0.8	-2.11	2.5			
⊕ AA-	1	4.6	0.0	0.00	4.6			
⊕ A+	1	1.5	1.5	0.00	3.3	8.0	0.8	
⊕ A	1	1.6	1.5	0.00	3.3	2.1	2.1	
⊕ A-	3	4.1	0.0	0.00	5.1	8.8		
⊞ BBB+				0.00				
Total	8	12.0	2.2	-2.11	15.5	12.0	3.2	Ų
	Inter	nal Rating Wis	e Summary (In Mill	ions)				
Industry Group	Count of UCC	Fund Exposure	Non Fund Exposure	Fungibilty	Net Exposure	FB O/s	NFB O/s	Out
□ BANK	1	0.	1 0.0	0.00	0.	1 0.3	0.3	
1234	1	0.	1 0.0	0.00	0.	.1 0.3	0.3	
	1	1.3	7 0.8	-2.11	2.	5		
	1	2.4	4 0.0	0.00	2.	6		
Total	8						3.2	
	la.t.a.	! D! WE-	e Summary (In Mill	:\				

	Inte	rnal Rating Wi	se Summary (In Mil	lions)				
Promoter Group	Count of UCC	Fund Exposure	Non Fund Exposure	Fungibilty	Net Exposure	FB O/s	NFB O/s	Outsta
⊕ Dumgrp1	3	5.8	0.8	-2.11	7.6	8.8		
□ Dumgrp2	1	1.5	1.5	0.00	3.3	2.9	2.9	
□ Dumgrp3	1	1.4	0.0	0.00	1.4			
□ Dumgrp4	1	4.6	0.0	0.00	4.6			
□ No aroup	1	0.1	0.0	0.00	0.1	0.3	0.3	_
Total	8	12.0	2.2	-2.11	15.5	12.0	3.2	, i

Banking





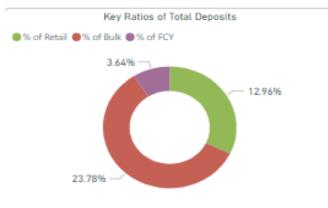


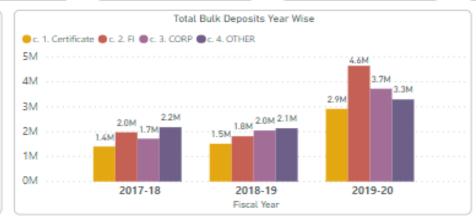
Liability Report- Book Deposits & Long Term Funds

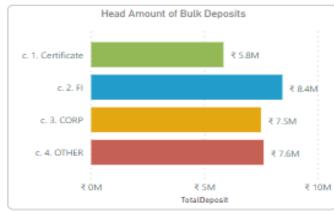


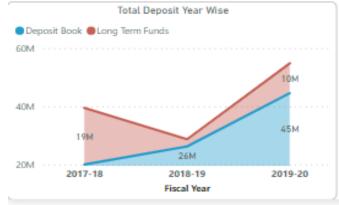
₹ 123M Total Deposits ₹ 50M Term Deposits ₹ 41M Deposits In CASA ₹ 91M Book Deposits ₹ 32M Long Term Funds

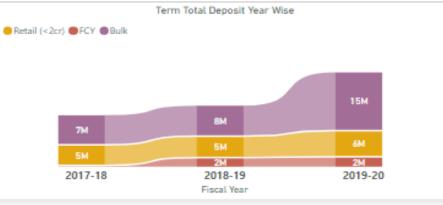
Amount in Cr







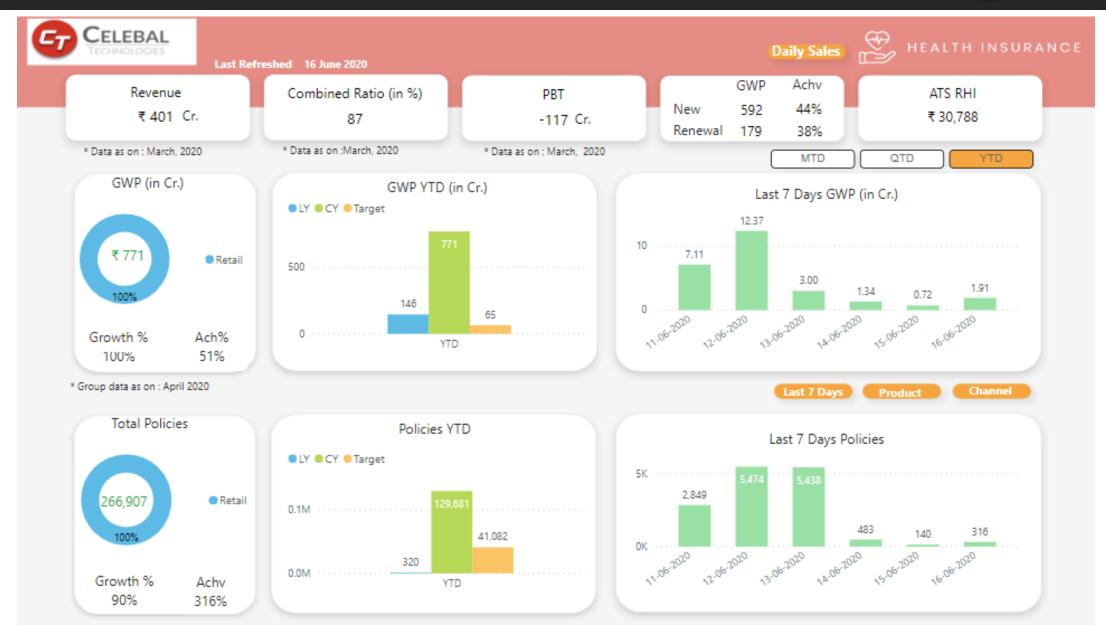






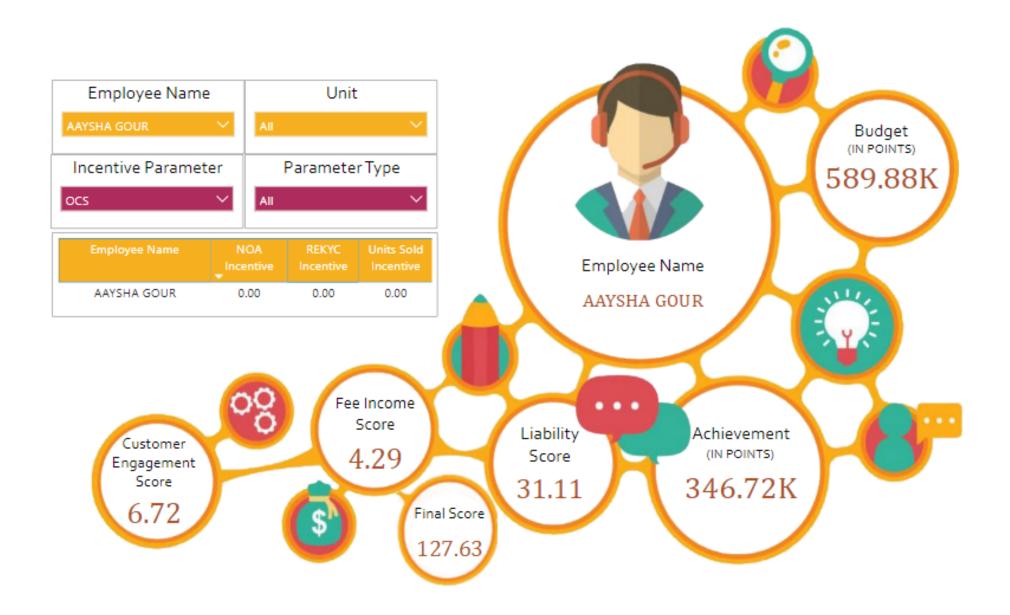
Banking





Employee Performance Tracker



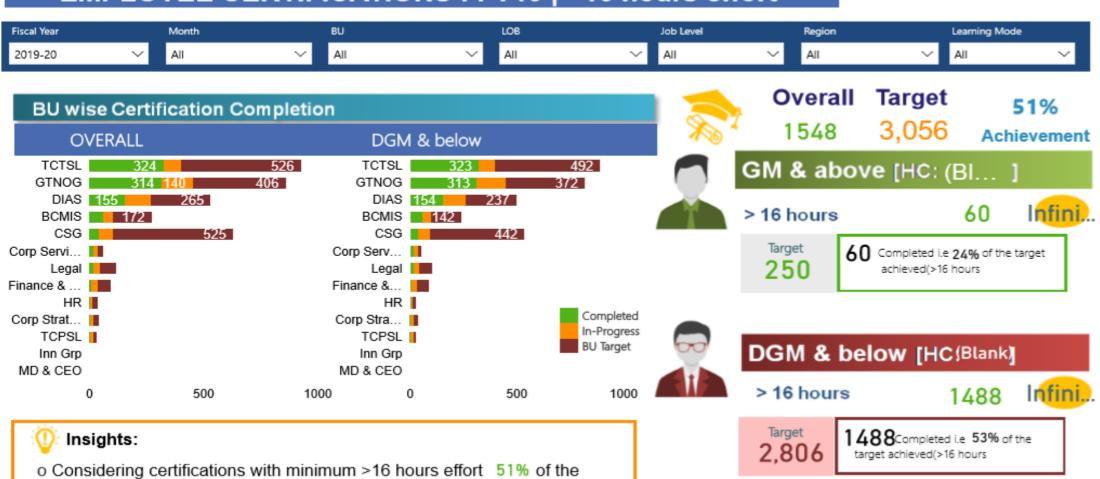


Employee Performance

annual certification target achieved



EMPLOYEE CERTIFICATIONS: FY19 | >16 hours effort

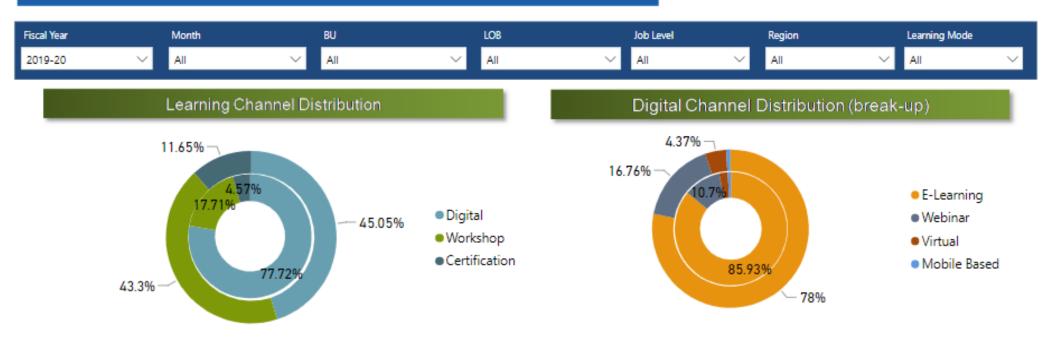


% = Participants as a % of headcount of given population HC: Headcount

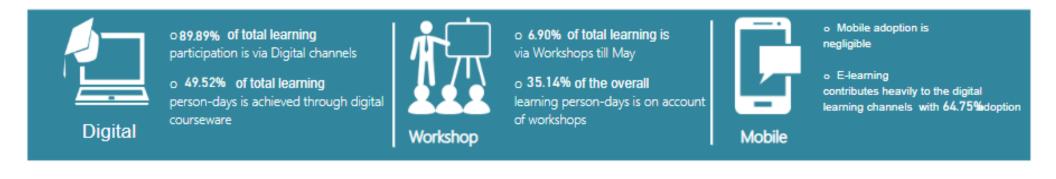
HR Analytics (Channels)



LEARNING CHANNEL DISTRIBUTION

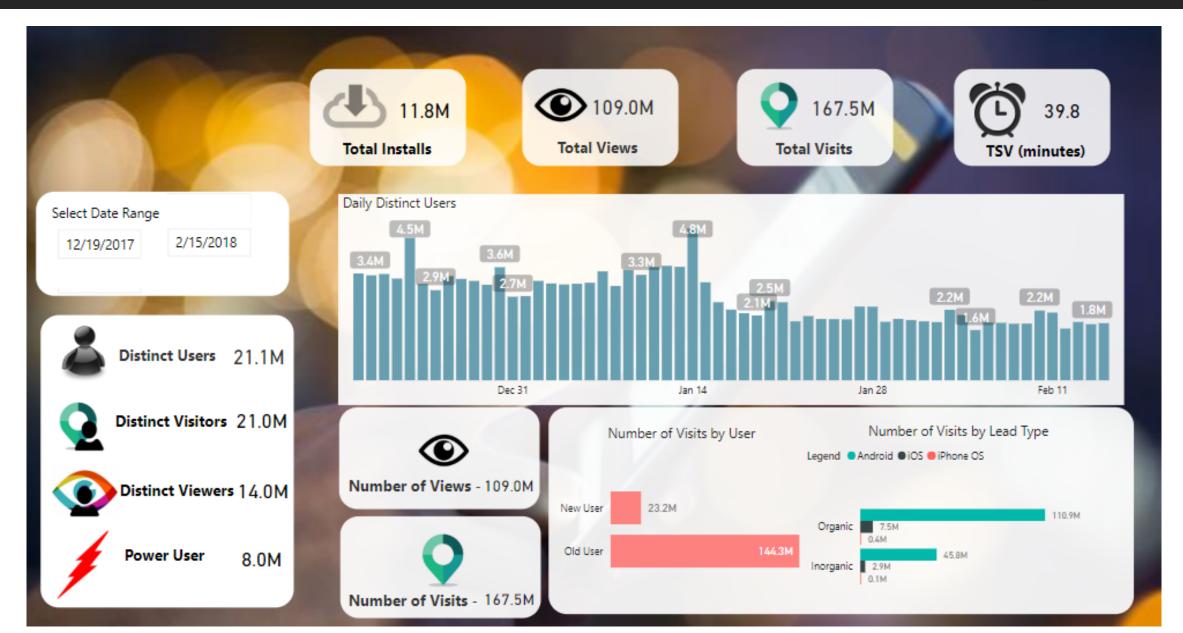


Outer Ring: Person days covered per channel | Inner Ring: Learning Participation per channel



User Trends for Media Application





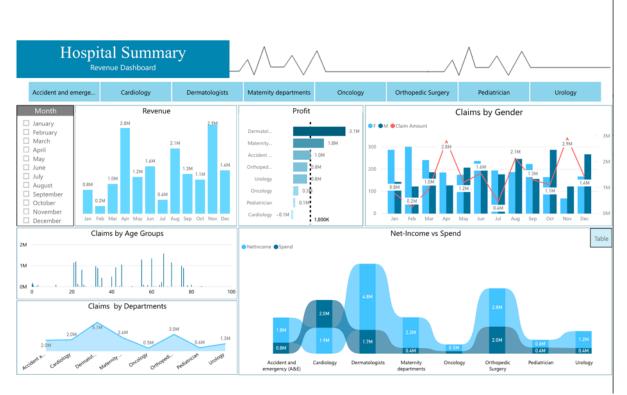
Supply Chain- Top Management

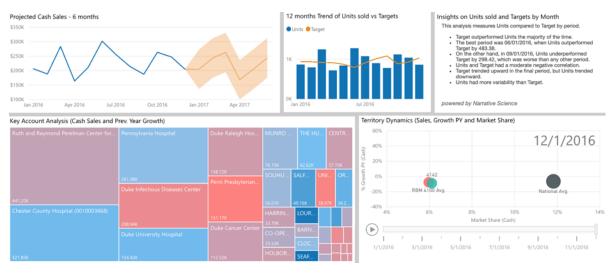


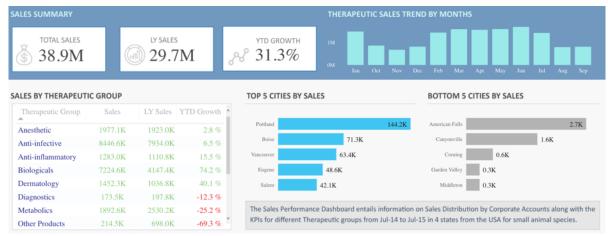


Pharma/Healthcare





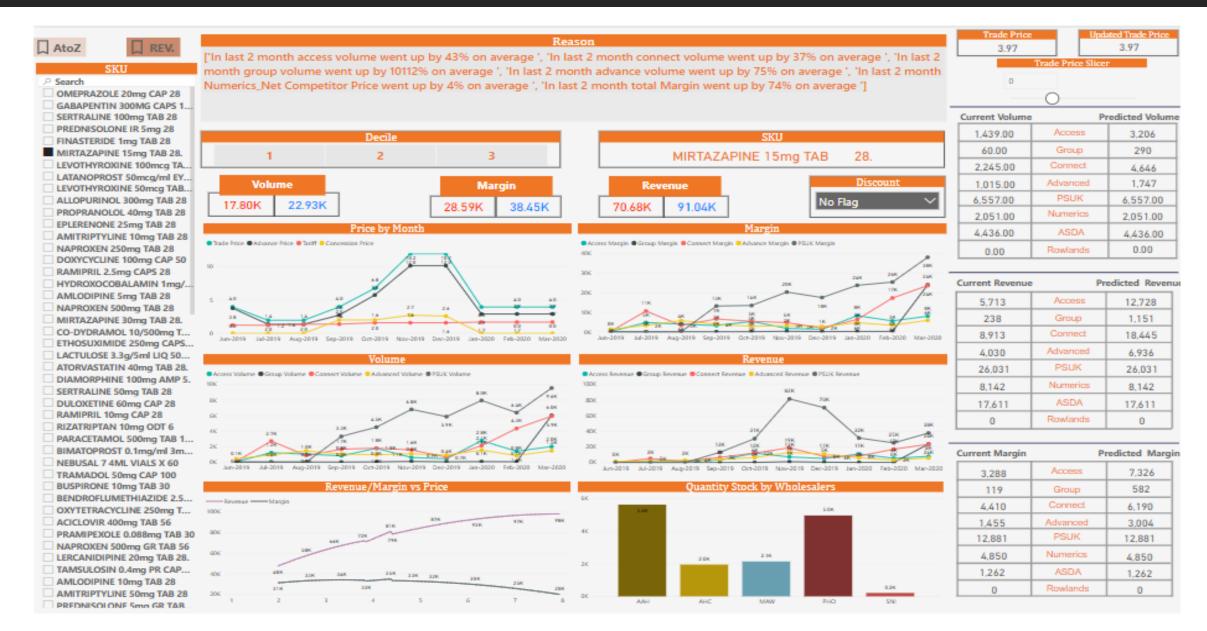




Analytical Features in Power BI

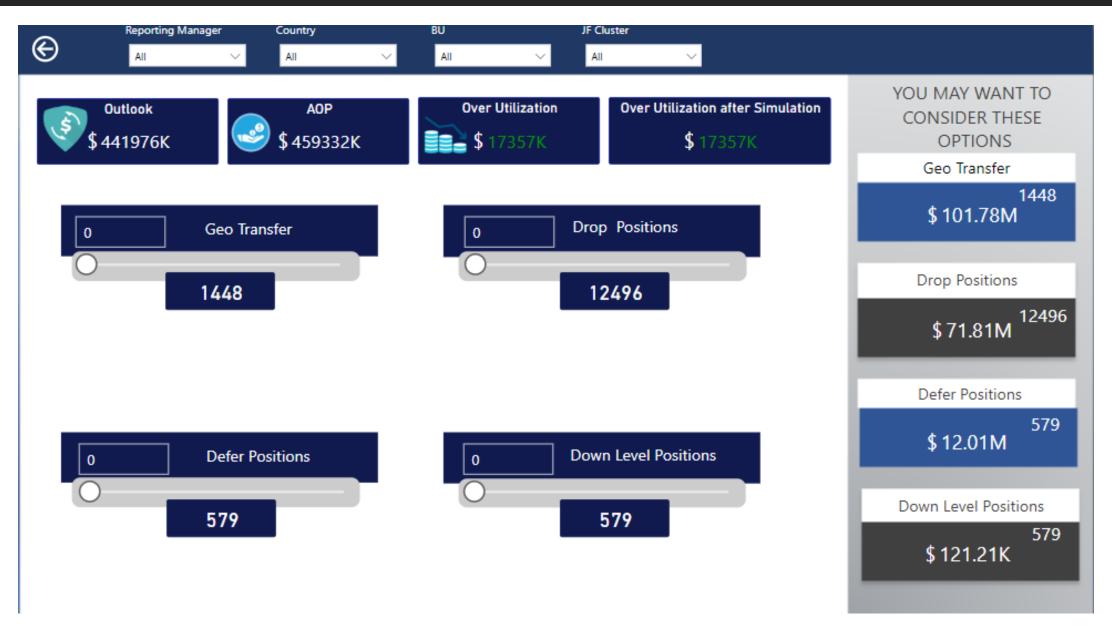
Price Recommender – What if + Al





Annualized Operation Planning — What if GELEBAL

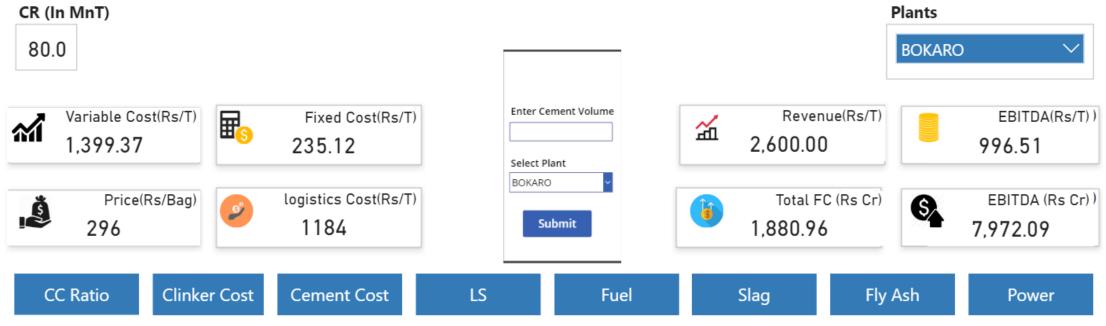




Planning through Power Platform - Writeback CET CELEBAL



Financial Planning & Analytics(FP&A)

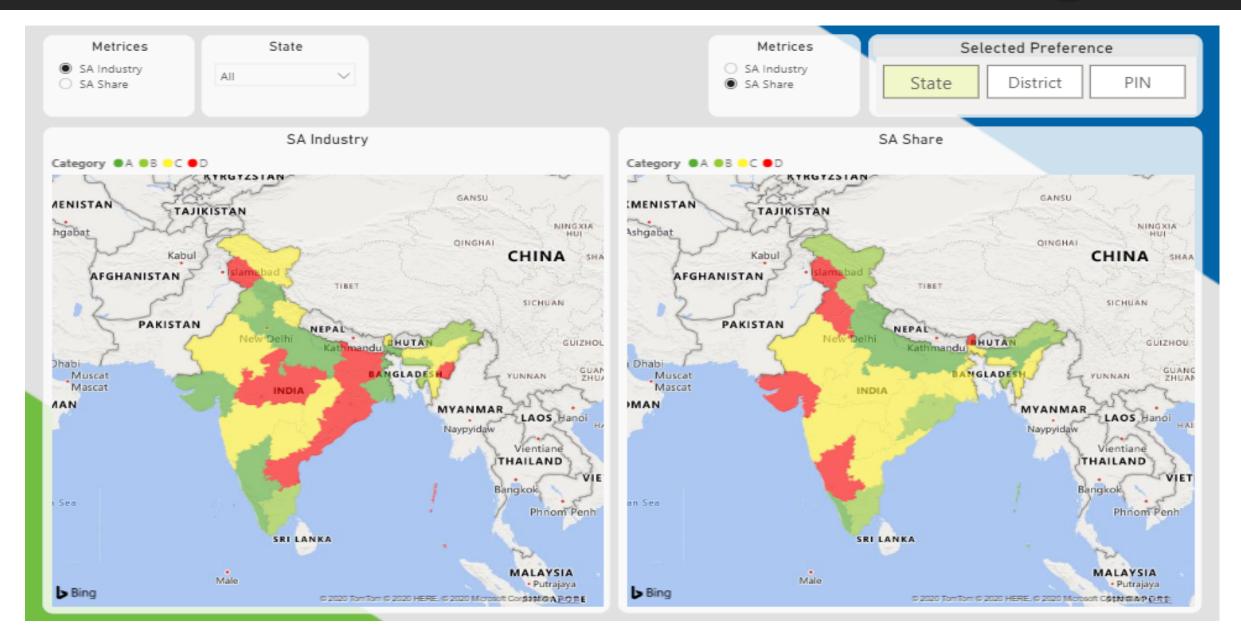


CC Ratio

Volume	Value
Cement_vol_MnT	80.00
Max of cc_ratio_MnT	1.70
clinker_vol_MnT	47.06

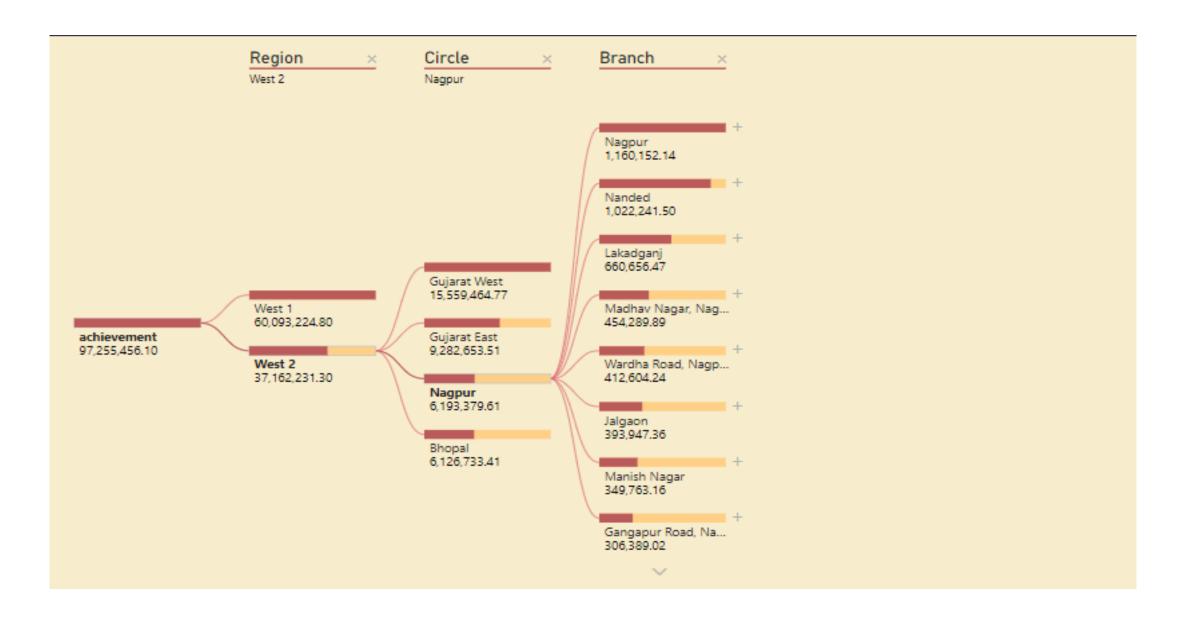
Geo Spatial KPIs Comparator





Achievement – Decomposition Tree

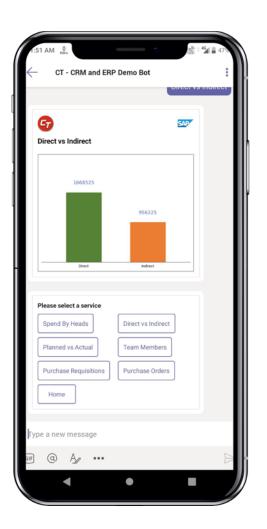


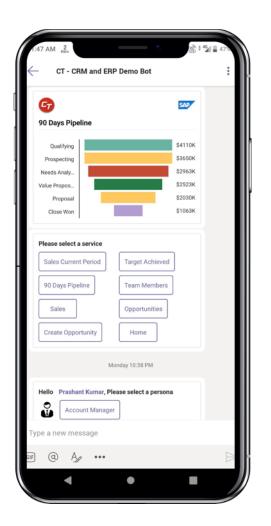


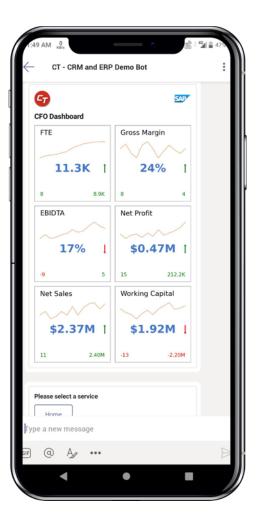
SAP/ERP Chatbots on Teams

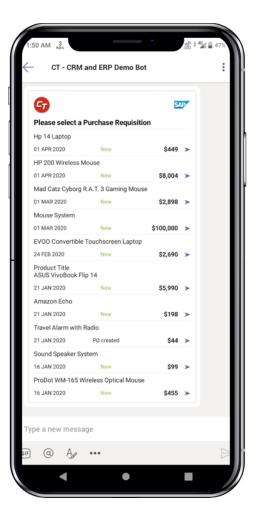
SAP Chatbots





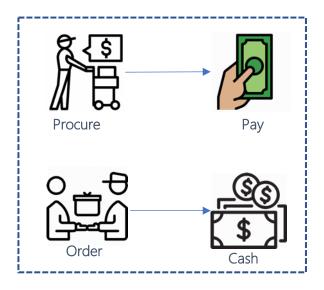






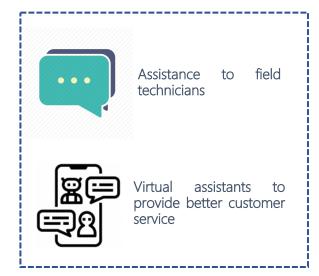
SAP ERP Processes on Teams



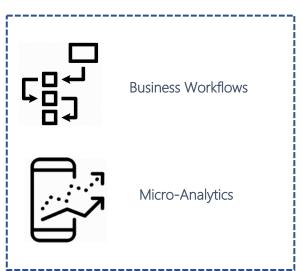












SAP ERP Processes on Teams



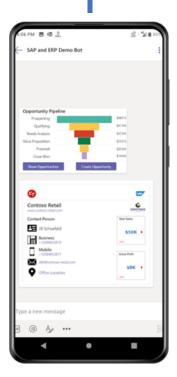
Run workflows like Procure to Pay, Order to Cash through chatbots on Teams that can speed up execution time

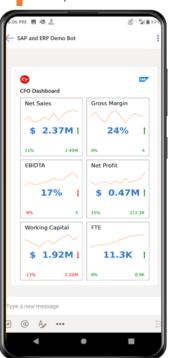
Check status of Invoices , Account Receivables , Opportunities etc. Approve PR, PO process and expedite the workflow.

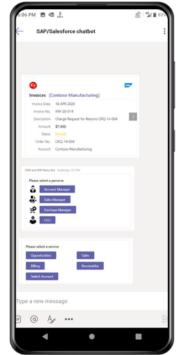
Generate Quick Insights in realtime entering just a few commands or using natural language Sales teams can update customer opportunities in the CRM via a bot

Managers can get inbound alerts regarding project delays

Service bots can assist field service technicians in their work Virtual assistants can provide customer service and also work as your sales representative Bots can carry out most of the work of administrative assistants such as scheduling meetings Employees have to spend less time on learning new software applications or look at the Mundane SAP screens

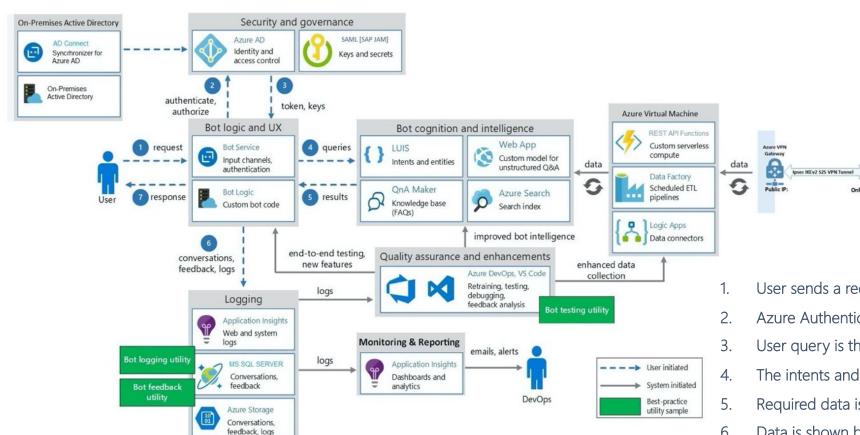






Architecture and Flow



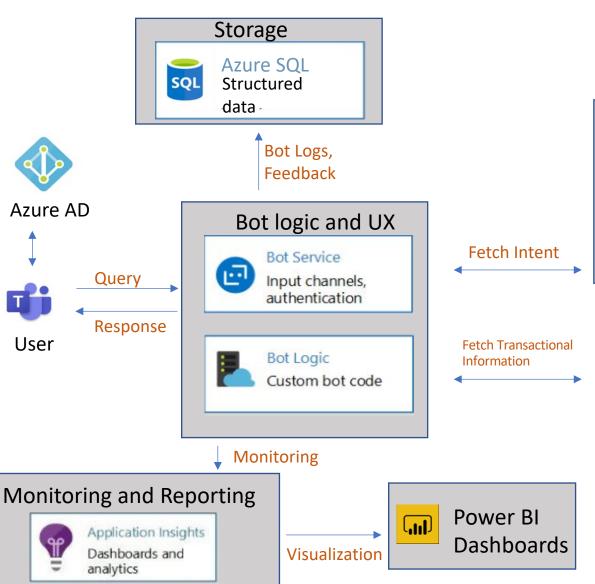




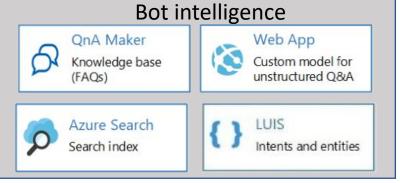
- Azure Authenticates the user and grants tokens
- User query is then broken into pieces and rearranged
- The intents and entities are the passed onto the API
- Required data is pulled from SAP authentications using tokens
- 6. Data is shown back to the end user and logs are generated
- Capable of Multiple interactions with natural interface
- Capable of Self Evolving (self-learning)
- 9. Run intelligent planning solutions on the bot.

Chat-Bot Functional Architecture





- User guery is then broken into pieces and rearranged
- The intents and entities are the passed onto the API

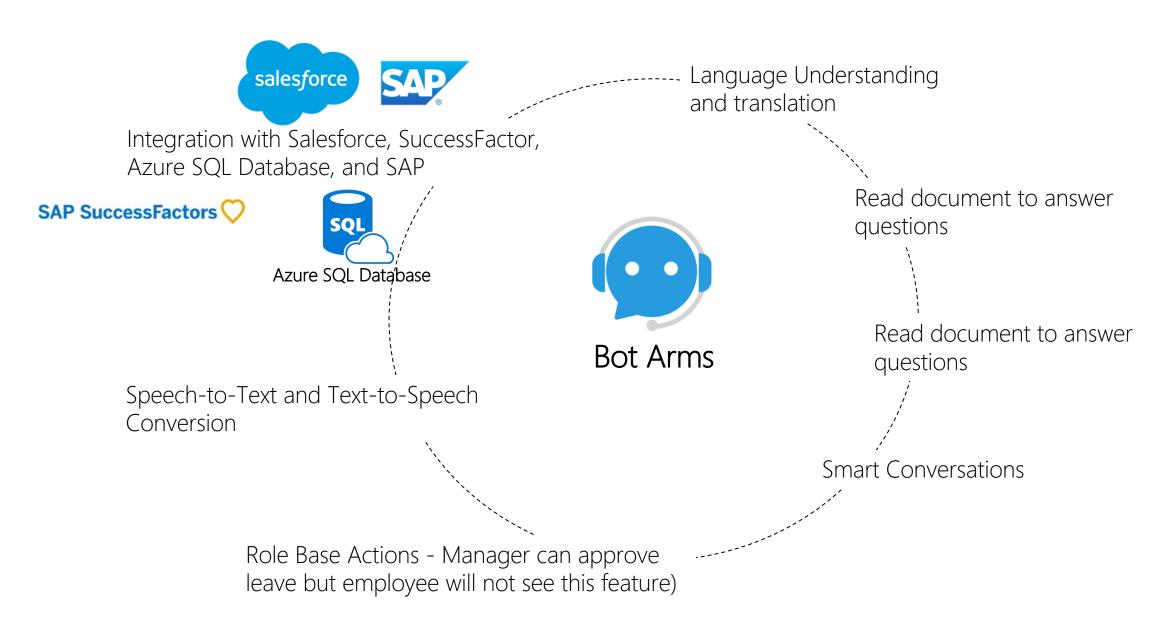




- Required data is pulled from SAP authentications using tokens
 - Data is shown back to the end user and logs are generated
 - Capable of Multiple interactions with natural interface
- Capable of Self Evolving (self-learning)

Celebal Tech Bot Arms





Celebal Tech Bot- HR Modules



Leave Management

- Apply for leave
- View leave balance
- Delete leave application balance
- View leave application status
- Question and answering of leave policy (directly from docs, plug and play, no training required)

Recruitment

- Can refer candidates
- IJP (Internal job posting)
- Can open position (only manager can do this)

Survey

- Bot is able to take different survey's like
- Employee grievances survey
- Feedback survey

Payroll

- View salary slip
- View bonus
- Apply for reimbursement
- Question and answer of payroll policy

Employee Benefits

- Question and answering of Employee Benefits policy)
- Integration with Third Party

L&D

- Opt different skill trainings
- Portfolio
- Access my skill repository
- Integration with external Parties

Celebal Tech Bot- IT Modules



Troubleshoot Issues

- System issues
- Software issues
- Internet issues
- Printer issues
- Other Issues

Request Softwares

- Windows operating system
- Linux operating system
- Antivirus
- Microsoft Office 365
- Others Software request
- Any Custom Software

Reset Password
Change Password

Request Hardwares

- Laptop
- Keyboard
- Mouse
- Monitor
- Webcam
- Headphone/Mic
- HDMI
- LAN Cable/Splitter
- Power Extension

System Upgrade

- Software and Hardware upgrade
- Graphics upgrade

Raise an Issue

Query issues by raising a ticket



Thank You