

# **OpsBot : Intelligent Workplace Assistant Bot**

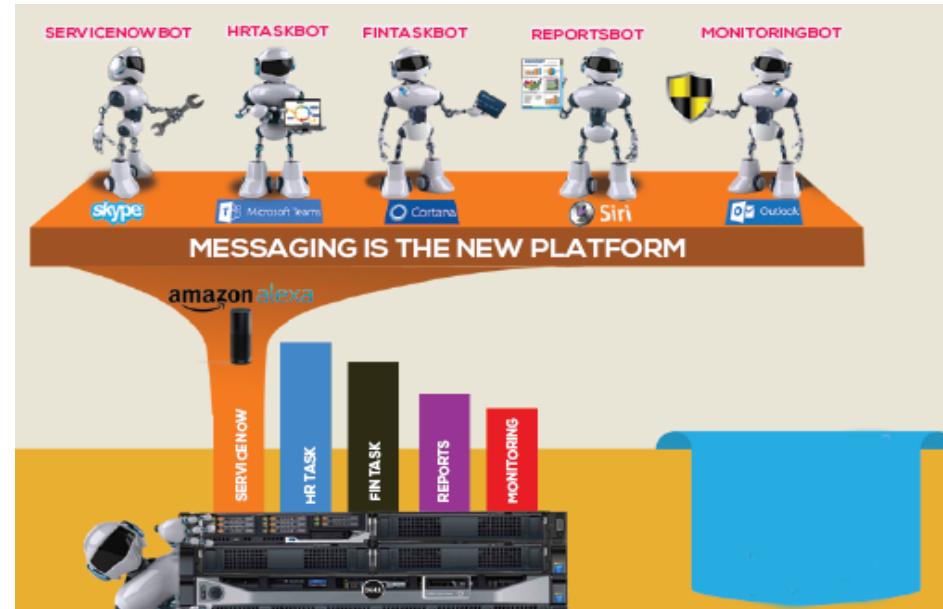
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2017HT13425

# Human Driven (Vs) Bot – Driven

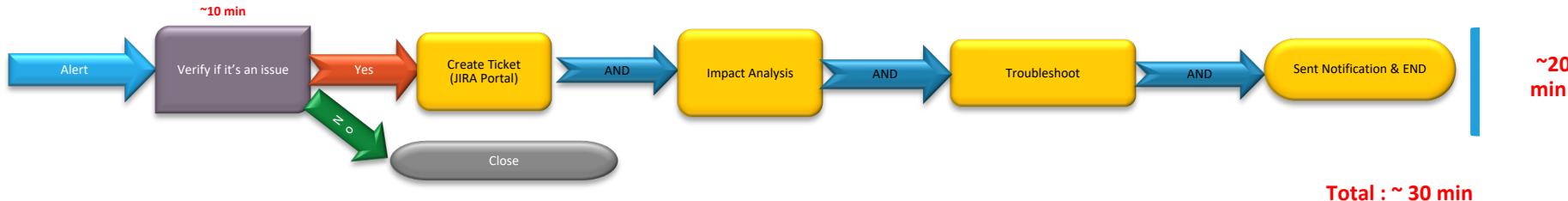
## CURRENT REALITY – Human Driven

- Incident Management
- Deployment Management
- Finance Settlement Process
- HR Recruitment
- Admin Tasks

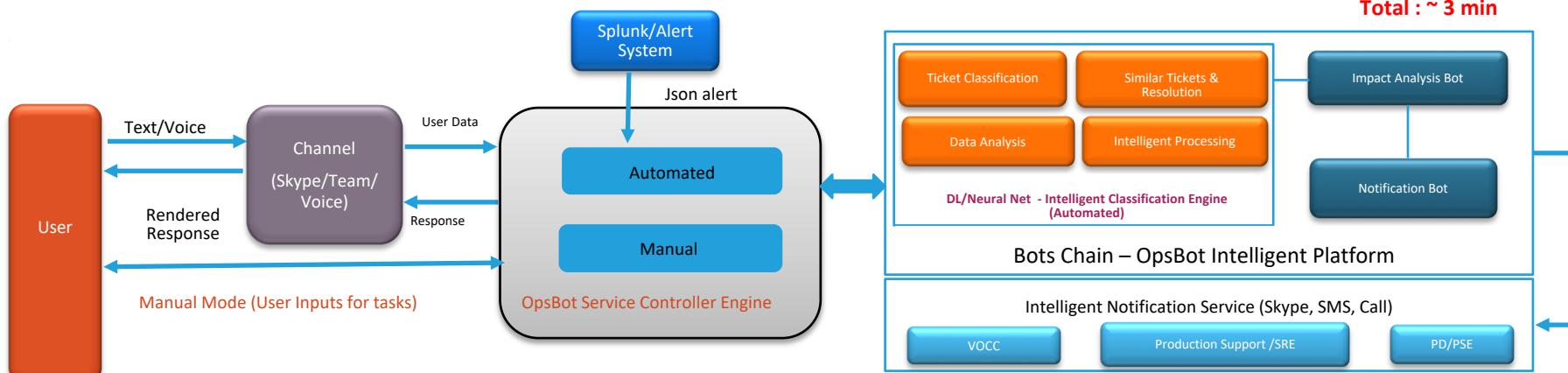


# Current Reality (Human Driven) (Vs) New Reality (Bot Driven)

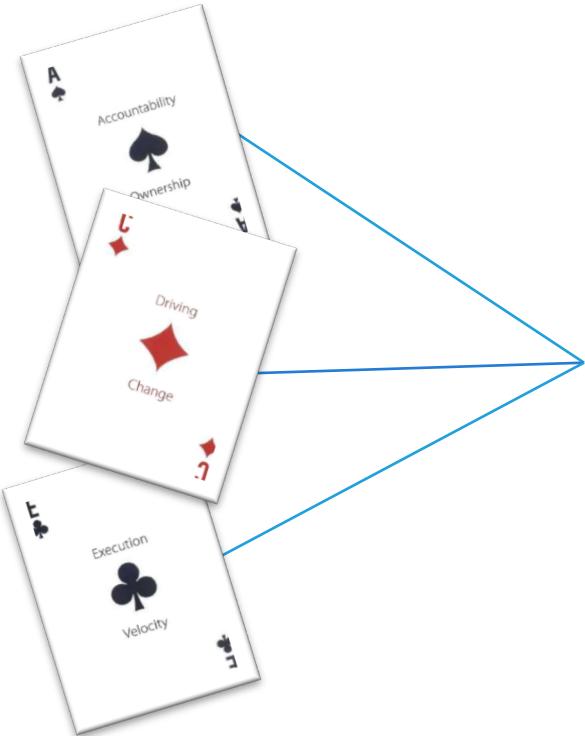
## Human Driven Approach



## Bot Driven Approach



# OpsBot – An Intelligent Workplace Assistant



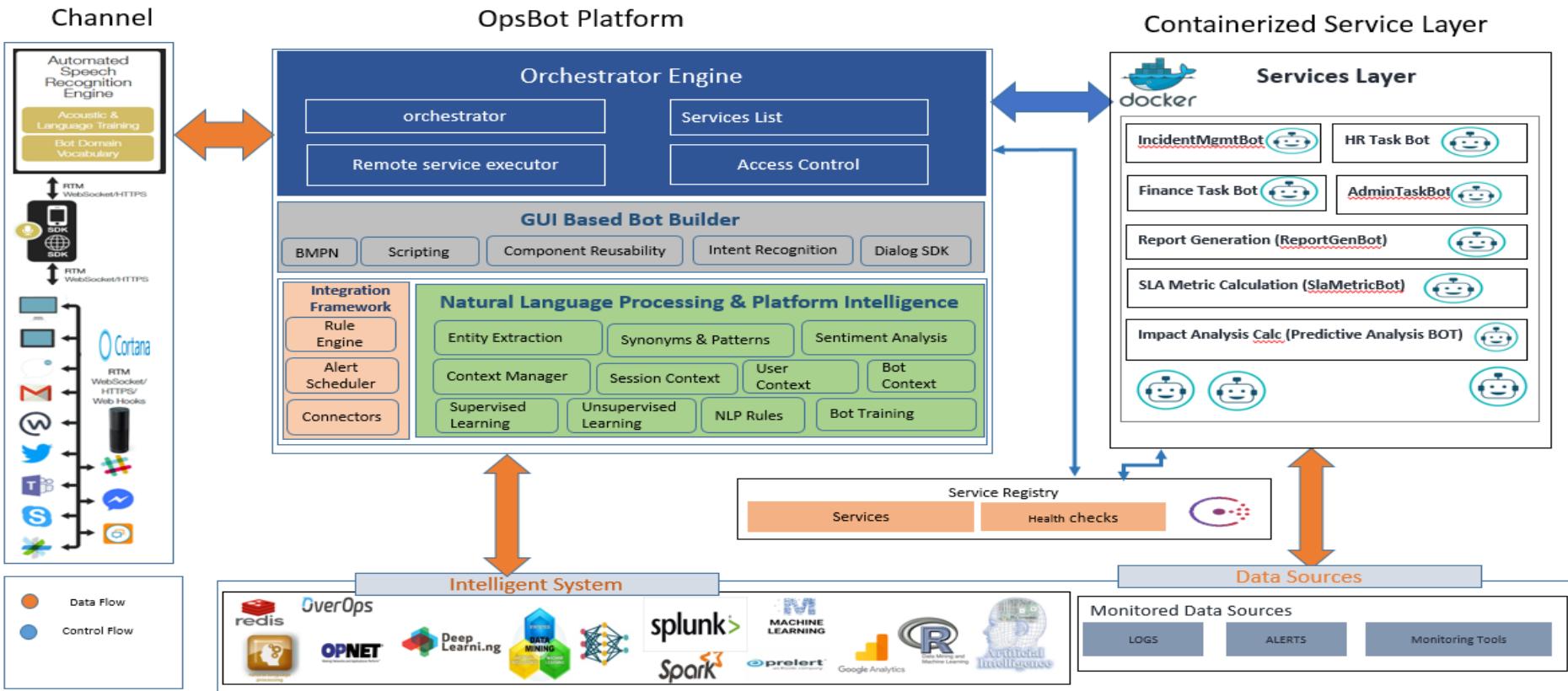
## What is OpsBot ?

- Chat as the primary communication, workflow medium
- **Bot-to-Bot, Human-to-Bot** communication.
- Reduced context switching [ **Chat window, no multiple page navigation**]
- Task Delegation for repetitive known tasks.
- **Actionable User Commands eg 'create jira ticket'.**

## OpsBot Characteristics :

- **Self-driven:** Triggering events/actions based on intelligence.
- **Context Aware :** Meaningful actions from Chat Conversation
- **Command-Action model:** NLP - Command driven model.
- **Auto-Scale:** ‘**Bots Chaining’ & ‘Containerized Services’.**
- **Platform Intelligence :** ML, Deep Learning, Neural Net, AI
- **Self-Healing and Smart Routing Capabilities [Predictive Anomaly Detection]**
- **Intuitive Coloration**

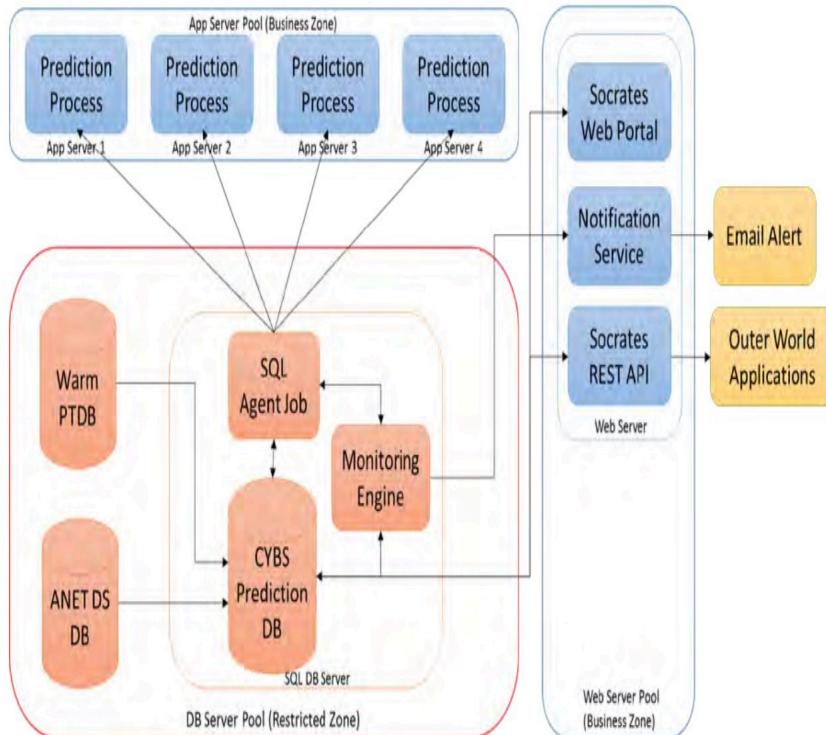
# OpsBot – Technical Architecture



# Technical Architecture – Component Detail

- **OpsBot Platform:**
  1. **Bot Builder :** BPMN or Business Process to working Bots [(no coding required ☺)]
  2. **NLP & Platform Intelligence :** ML algorithms, Semantic Analysis
  3. **Intelligence Tools Integration :**
    - PreAlert - Predictive Anomaly Detection (helps in Smart Routing – Pro Active)
    - OverOps – Intelligent source code analysis tool to isolate the issue.
    - 3<sup>rd</sup> Party connectors to tools - DL/Neural Networks/NLP libraries, AI & Data Mining systems.
    - Backbone for intelligent data processing, helps in **self-evolving Bot**.
    - **DL/Neural Networks** helps in **automatic ticket classification** (with relevant resolution based on historical data).
  4. **Data Sources :** Alerts, Events and Notifications.
- **Containerized Service Layer :**
  1. Scaling of Services (Elastic Scaling).
  2. CICD, Simple packaging and fast deployment

# Socrates – Forecasting Tool



1. Socrates is a powerful tool for predicting a merchant's future transactions volume using historical transactional data.
2. For each enrolled merchant, it will take aggregated per minute transactional data as input and generates predictive data.
3. For this purpose, the ARMA model operates on 13 weeks' worth of historical data and calculates predicted data points for the 14th week (future).
4. The main objective of Socrates is to calculate transactional impact in the case of a network issue/outage with data centres. It can also calculate transactional impact for any issue occurred.
5. The delta between an actual count of transactions and the predicted count will provide the impact of the issue on transaction volume.

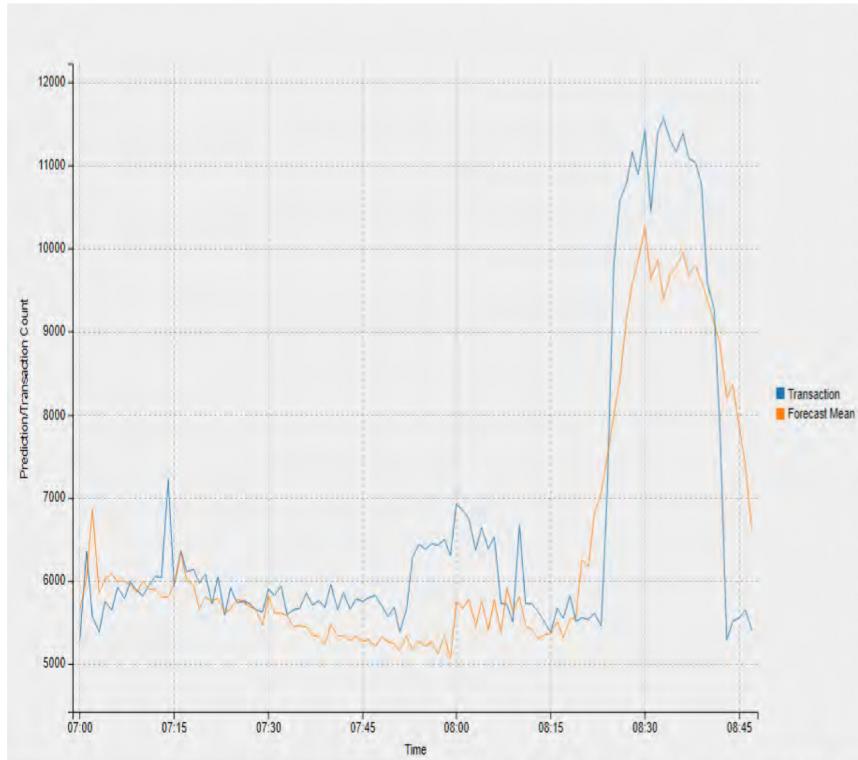
# Socrates – Forecasting Tool

## Socrates Technical Details :

- Using a SQL Server Agent job, Socrates will pull per minute aggregated API service details data, grouped by merchant id from our database in 5-minute interval.
- This data will be stored in another database on Prediction Application server.
- Merchant data is stored in Merchant table. The top-level merchant data is stored MasterMerchant table (which will have top 600 merchants ) stored.
- Collect the transaction count across all merchants for a particular minute irrespective of the merchants list in Merchant table.
- Then Aggregate the data based on the MasterMerchant for a particular minute.
- All the aggregated data both merchant and mastermerchant wise for that minute are stored in PredictionData table.
- The data in the prediction intermediate table is divided into 3 equal chunks for parallel processing. This division is maintained in the Parallelization table.
- Three SQL Agent jobs processing the data in parallel. With each agent job working on its own set of data. We have three application servers where the prediction service is installed.
- This SQL agent will take 20 minutes of data at any point in time and give it to the prediction server as an input. The Prediction service consumes 13 weeks of transactions per merchant and predict the 14th week.
- This is achieved with the help of the ARMA (Auto Regressive Moving Average) model. Once week 14 data is predicted, the data is synced back to the SQL Server table with 3 outputs Forecast Mean, Forecast Low, and Forecast High.
- Sliding window for the prediction analysis is used here.

# Socrates – Forecasting Tool

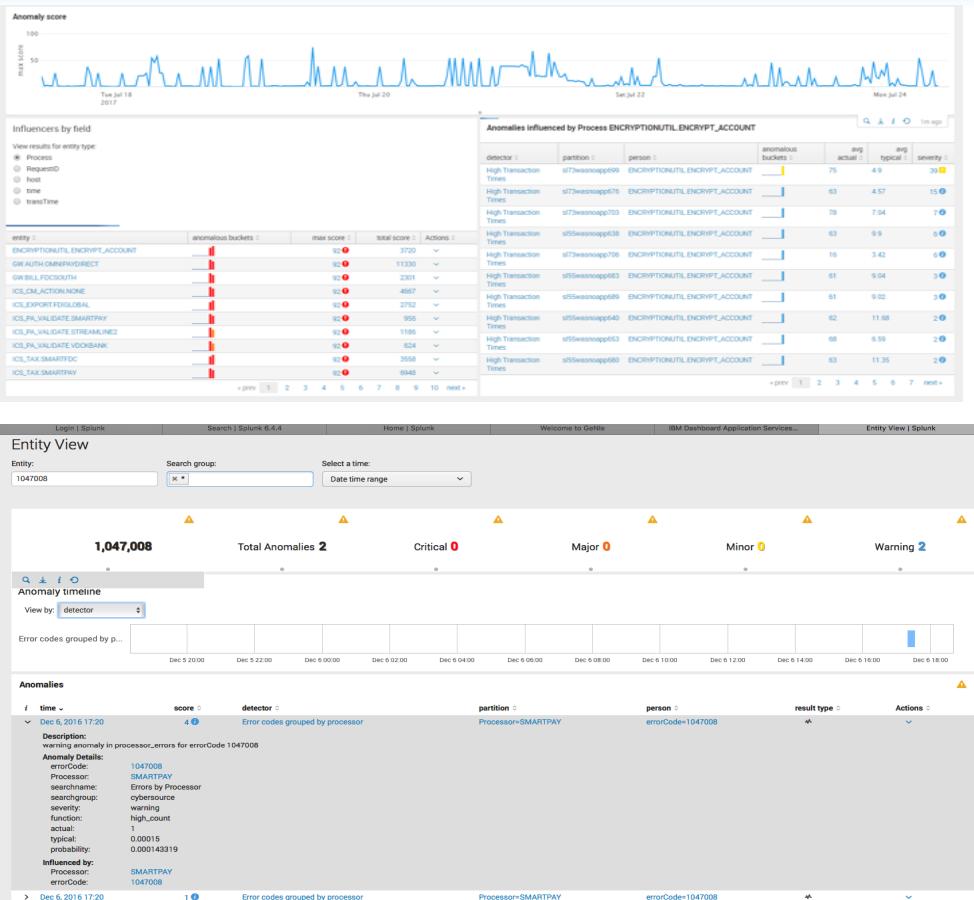
- Socrates is useful for current transaction trend analysis.
- Socrates provides accurate prediction results with deviation of  $\pm$  10% when compared with the current transactional flow.
- User can view predicted data at the merchant account level categorized as Overall Merchant. Socrates also provides greater granularity by allowing users to view specific MID-level predictions.
- Predicted data is visualized in the form a chart as well in a tabular structure.
- Users have the flexibility to view data based on provided input start/end date and based on incidents that have happened in the past.
- Socrates provides export to excel functionality, which will help users export data based on their requirements.
- Socrates has a continuous monitoring dashboard that provides ongoing and upcoming/forecasted data trends, which is, refreshed periodically every five minutes.
- Socrates provides on-demand email alerts to the support teams based on the configured deviation between current and predicted data tends.
- In future, we are planning to expose Socrates API's to other teams for data consumption. In addition, we are planning to position Socrates as an on-demand predictive analysis platform that can be deal with other types of data trends aside from transactional data



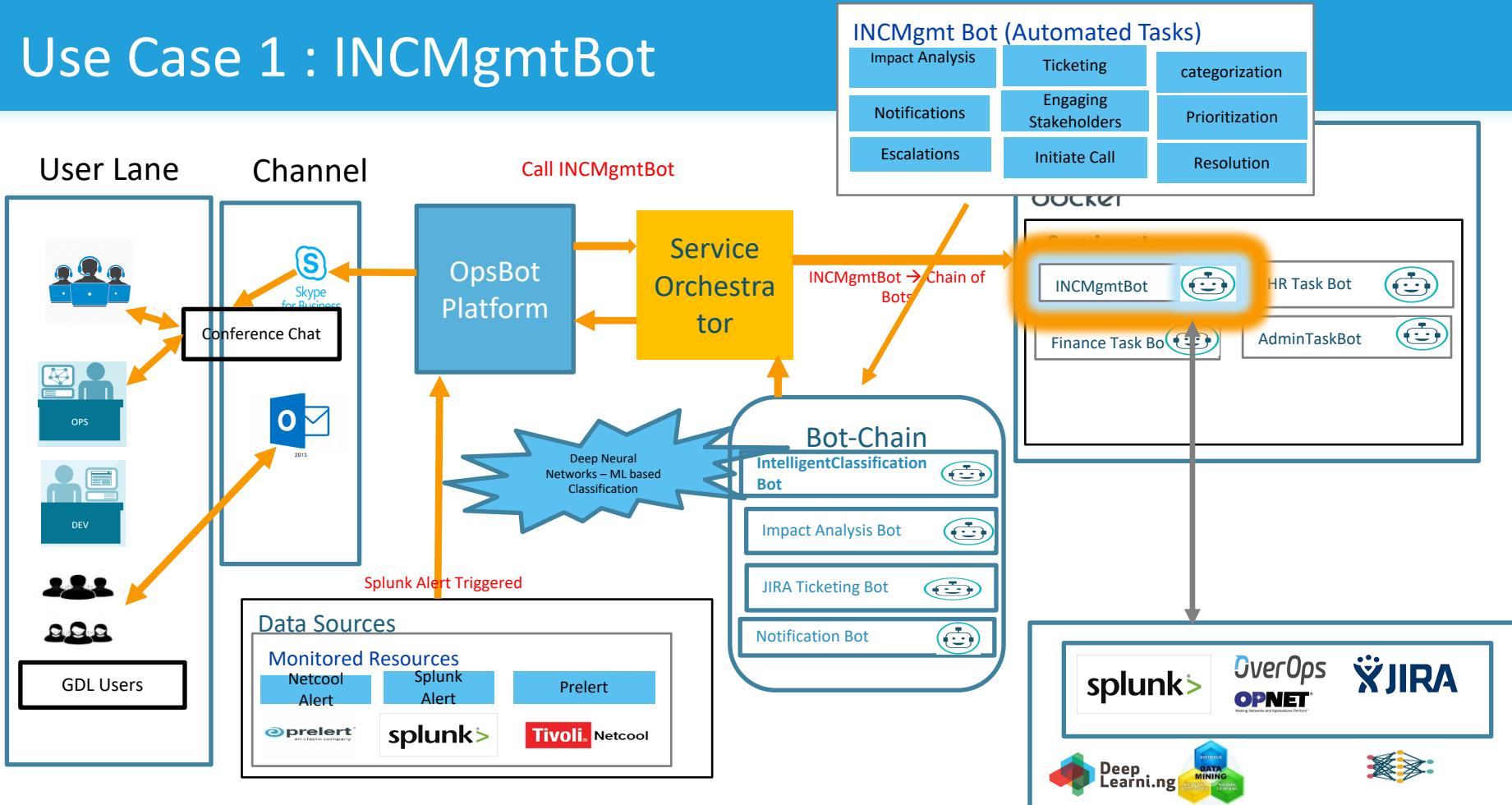
Merchant ID	Transaction Count	Forecast Mean	Forecast Low	Forecast High
Overall_All	722442	690265	506726	873813

# Preleert

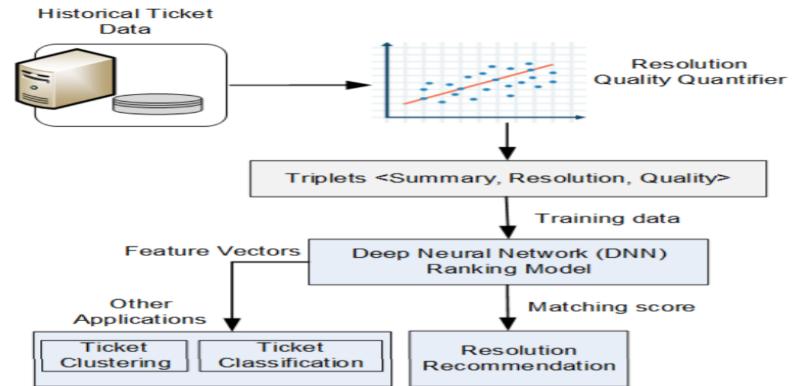
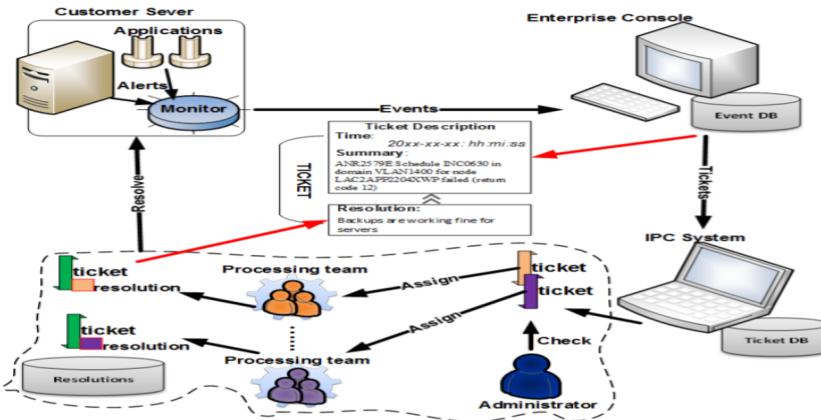
- Preleert's behavioral analytics platform uses machine learning to detect anomalies across massive data sets.
- It helps in automate the analysis of an organization's log data to find anomalies, link them together, and give you real insight into what's happening with your data.
- Preleert also helps IT security and operations professionals identify advanced security threats and IT performance problems faster and more accurately, eliminating manual effort and human error while reducing false positives.



# Use Case 1 : INC Mgmt Bot



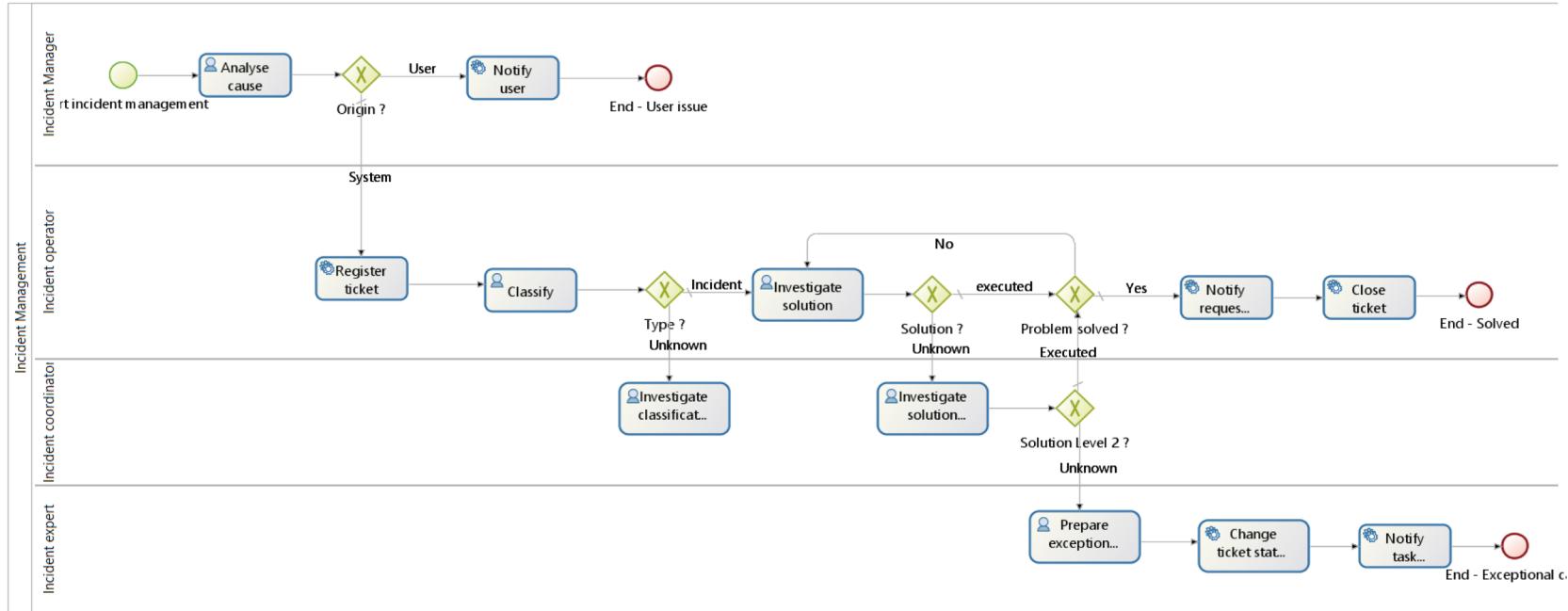
# Intelligent Ticket Classification/Resolution using Deep Neural Networks



## Intelligent Ticket Classification Engine :

1. Historical Data of each tickets and step-wise resolution details.
2. An automated system to recommend the best matching resolution for a given ticket summary from large ticket datasets (Data Mining)
3. Framework to Quantity the quality of ticket resolutions using a regression model.
4. The tickets with their quality scores from the resolution quality quantification are used to train using deep neural network ranking model that outputs the matching scores of ticket summary and resolution pairs.
5. This ranking model helps to find the best matching recommended resolutions for an incoming incident ticket.
6. In addition, the feature vectors derived from the deep neural ranking model can be effectively used in other ticket analysis tasks, such as ticket classification and clustering.

# OpsBot – IncMgmtBot POC Demo



# OpsBot – IncMgmtBot POC Demo

The image displays two windows of the Bot Framework Channel Emulator, both titled "Bot Framework Channel Emulator" and "http://localhost:3978/api/splunk".

**Left Window (OpsBot Response):**

- Header: "An Alert has Occured!!! OpsBOT Working On the Issue"
- Section: "SPLUNK ALERT DETAILS:"
  - Splunk Alert: EPS - 2997 CGK can't communicate with ICS
  - The alert condition for 'EPS-2997 CGK can't communicate with ICS' was triggered.
  - On-Call Action Items:
    - This is known issue and DEV team is working on retry mechanism
    - Please reach out to Apps/SD/DSOSA team only if there is a high number of failures and refer if there is any hardware failure issue.
  - Status:failure
  - Reason:user-initiated
  - Trigger Time:11:13:32 on March 11, 2017
- Bottom: "Bot at 11:24:41 AM" and a message input field: "Type your message..."

**Right Window (Impact Analysis):**

- Section: "Impact Analysis!!!!"
- Table:

Merchant ID	TxnCount Forecast
Overall All	47232 46066
Apple	16520 16436
TracFone Wireless	09281 08217
StarBucks	03079 03186
WeightWatchers	01587 00098
Facebook	00988 01028
Florida Sunpass	00736 00876
Trainline.com Ltd	00701 00826
Alipay	00593 00662
Groupon	00550 00408
Comcast	00454 00482
tracfone wireless	00433 00358
iTune SARL	00292 00268
British Airways PLC	00207 00231
FDR Ltd	00152 00167
LINE BIZ+ Pte Ltd	00138 00151
eHarmony	00128 00147
Air Canada	00126 00128
Debenhams	00124 00143
Symantec	00122 00130
JustEatHoldings	00117 00121
StateFarm	00111 00106
First Data	00106 00090

# OpsBot – IncMgmtBot POC Demo

Bot Framework Channel Emulator

<http://localhost:3978/api/splunk>

TAP Portugal	00001 00000
Shutterfly	00001 00000
Emirates	00001 00000
freemans ac_moto	00001 00000
Microsoft IT	00001 00000
Kemper Corporate Services	00001 00000
Tesco-Global Ltd	00001 00000
Qatar National Bank	00001 00000
Cable Network Egypt	00001 00000
Pinterest	00000 00020
Scholastic	00000 00004

Bot

Do you Wish to Create a Ticket for this Alert?



Yes. Create a Ticket for Me | View Similar Tickets

No. Proceed Without Creating a Ticket

Bot at 11:24:42 AM

Type your message...

Bot Framework Channel Emulator

<http://localhost:3978/api/splunk>

Summary	Profiles Mismatch - DMH Custom List
Issue Type	Investigation Request
Requesting Department	Customer Support
Assignee Name	Vanama, Kiran Kumar

Bot

A Notification Mail Has Been Sent to the Stakeholders



Bot

Incident Management Process Completed

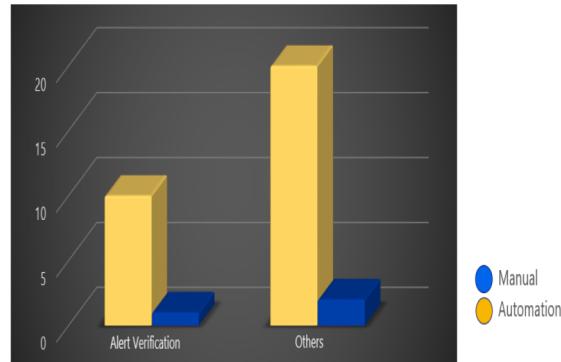
Issue Has Been Correctly Notified by OpsBOT



Bot at 11:26:07 AM

Type your message...

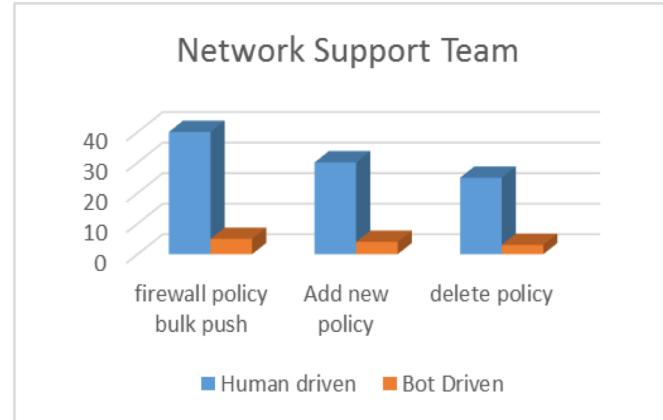
# OpsBot – Advantages



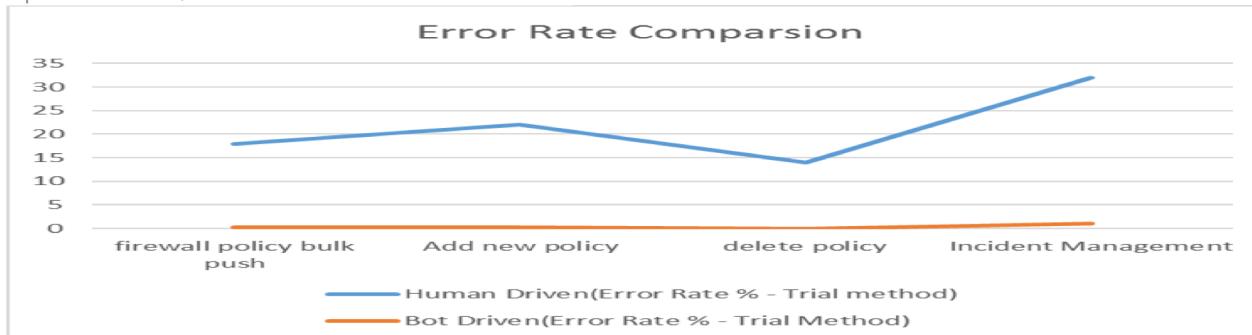
Manual - ETE ~ 900 min /Month

OpsBOT - ETE ~ 90 min /Month

Others: Create Ticket+Impact Analysis+Notification



■ Human driven ■ Bot Driven



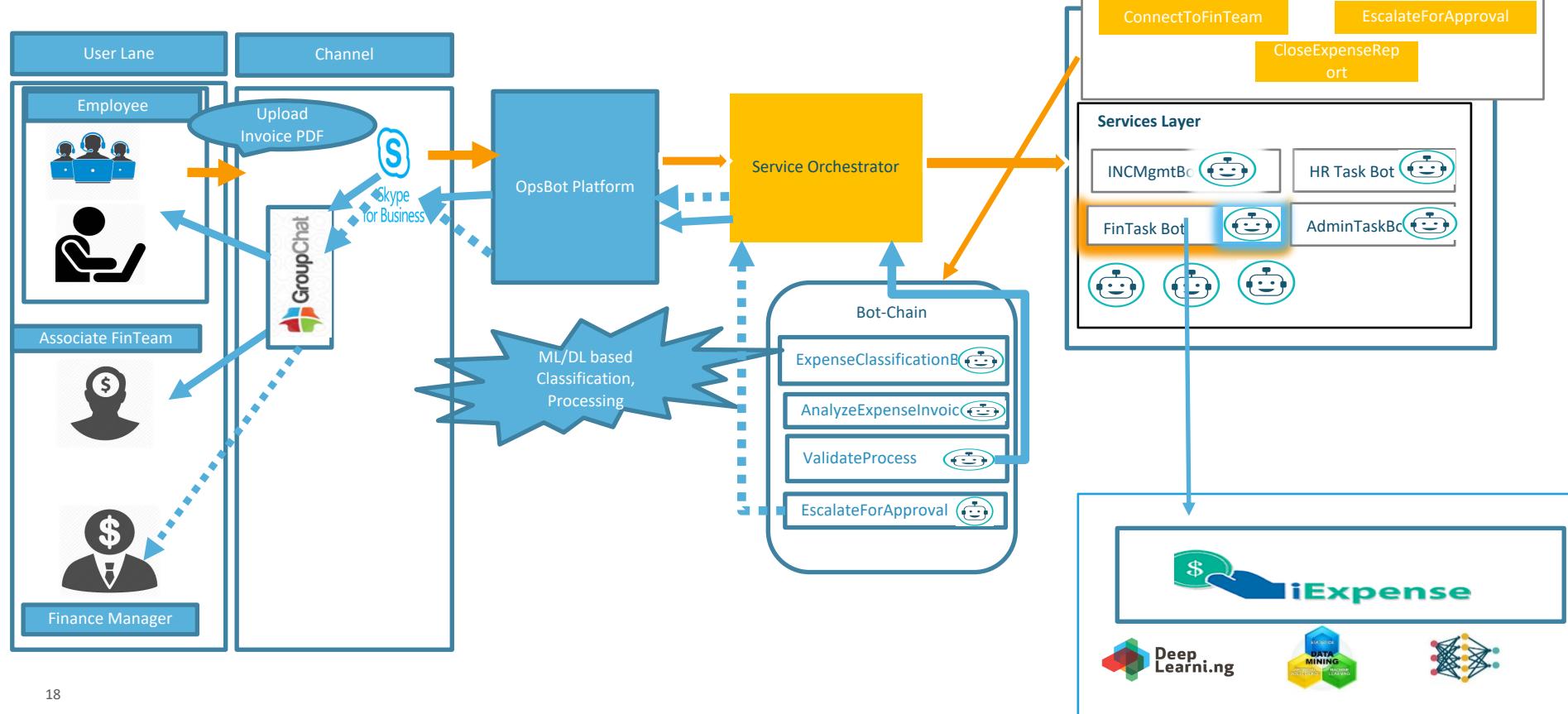
# OpsBot – Future Work/Evolution

## 1. Building new Bots for other Process/Operations Needs

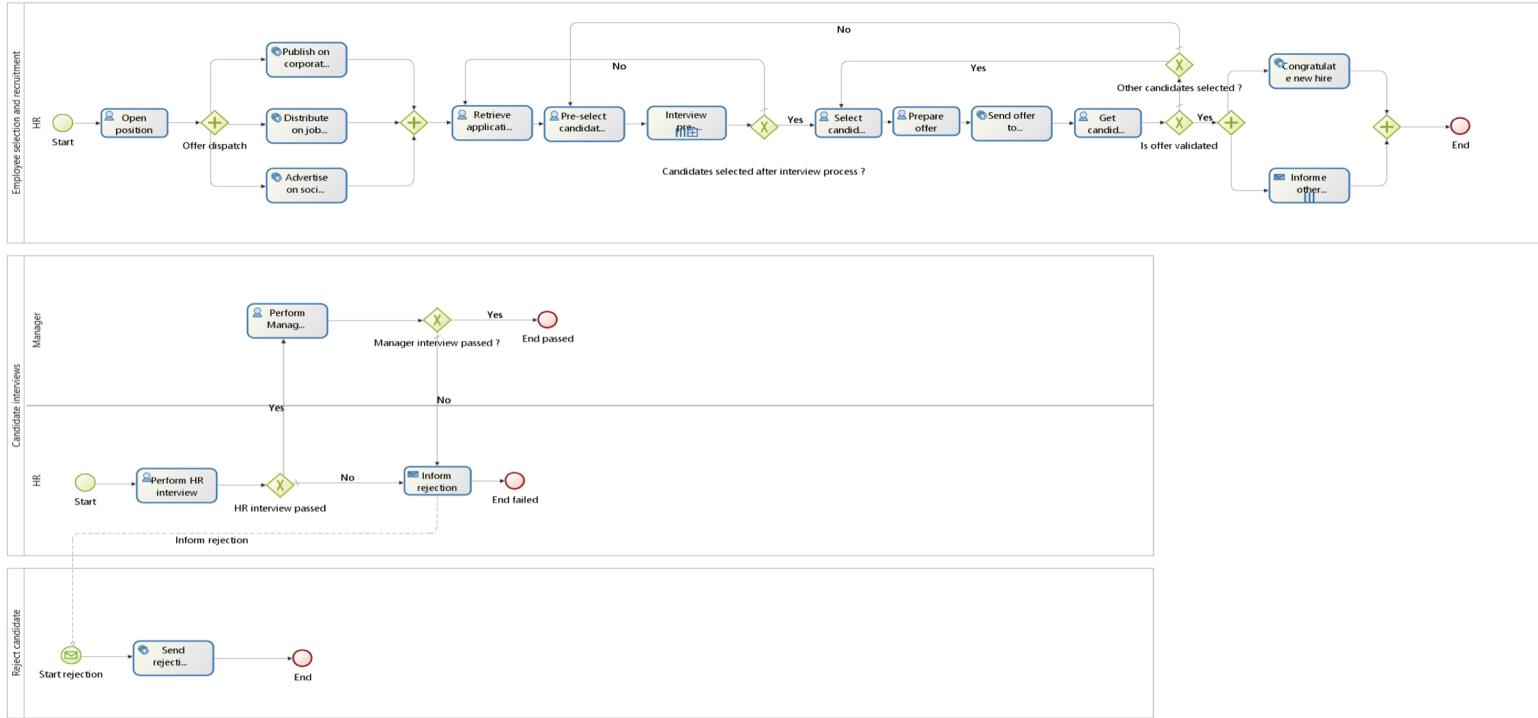
- **HRTaskBot** : Help in improving efficiency in recruitment process.
- **AdminTaskBot** : Help in inventory management, Collecting Feedback.
- **ITHelpDeskBot** : Integration to Visa Vending Machine
  - e-Token Generation – token per request.
  - Validated Vending Machine to Dispense the devices

2. Building new Bots for other Business Needs ex: **MerchantOnboardBot** (automating on-boarding process).
3. Seamless Transformation of processes and Integration to OpsBot Platform for better operation efficiency

# FinTaskBot (Expense Report Automation)



# HRRecruitmentBot



# ExpenseReportBot(Expense Report Automation)

