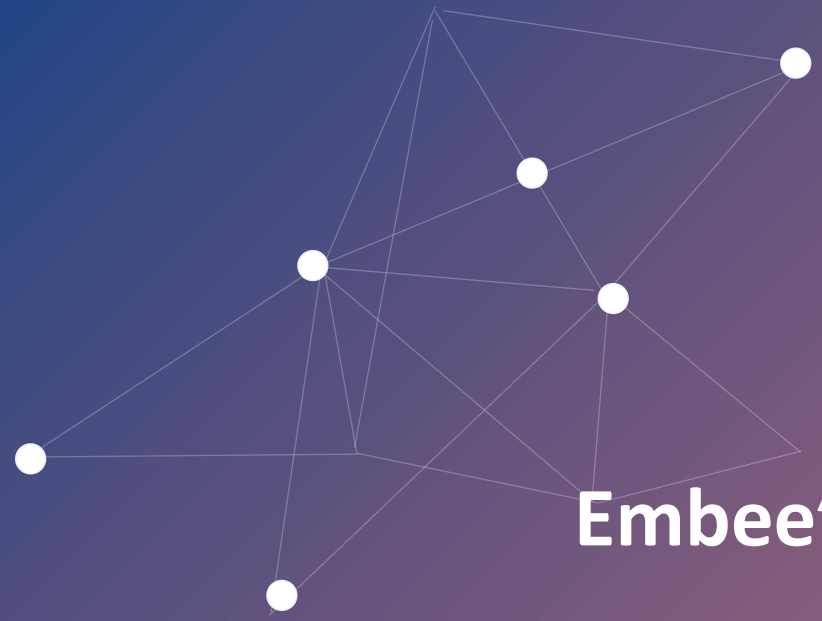
embee
Making IT Easier



EPSI

Embee's Predictive Service Intelligence

Infra-Server Management Made Now Easy !

AIML Workathon 2021 | Embee Software Pvt. Ltd. |14th December 2021

Meet the Geppetto's

Bipul Kumar Patra,
President, Technology

Jothiraman Murugesan,
Data and AI architect

Srayasi Patra
AVP- Technology COE & PMO

Avik Sarkar
Developer-Enterprise Applications-SharePoint

And The Embee Team

Integrate, Monitor & Manage the Infrastructure

Performance & Maintenance

Long Processes

Non-adherence to compliances

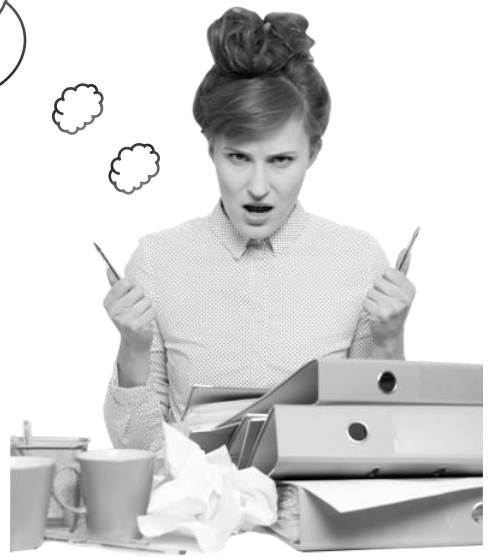
Multiple follow-ups/ reminders

Infrastructure Management tool

Too much toggling between the processes

Track/request/ Approve tickets

IT Support / Ticket Management



Auto learns through ML that saves human engagements

Consolidated view to any IT Support activities

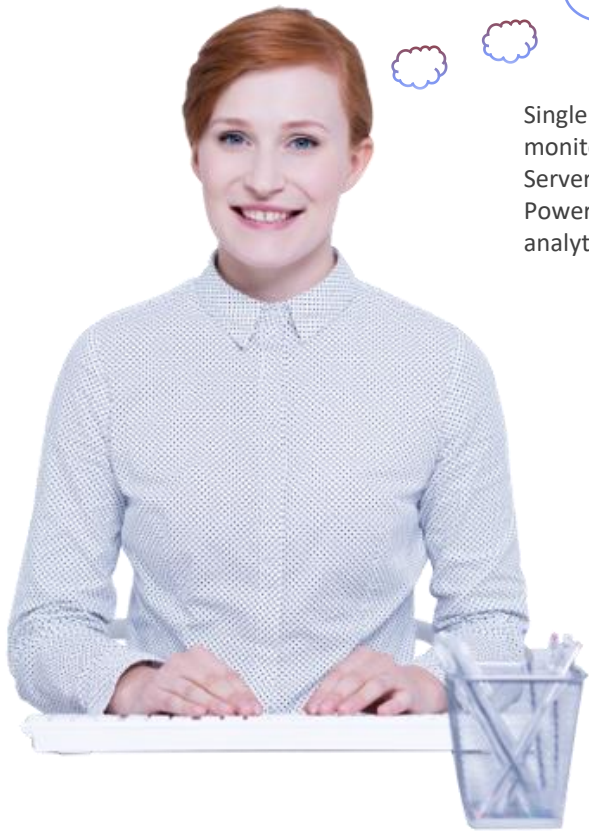
Simple, clutter-free experience for easy tracking

Single place to connect and manage requisitions

??

Single Place to monitor IT Server using Power BI & log analytics

Vulnerability assessment with resolution steps & 24*7 data monitoring to combat data breach.



EPSI

embee
Making IT Easier

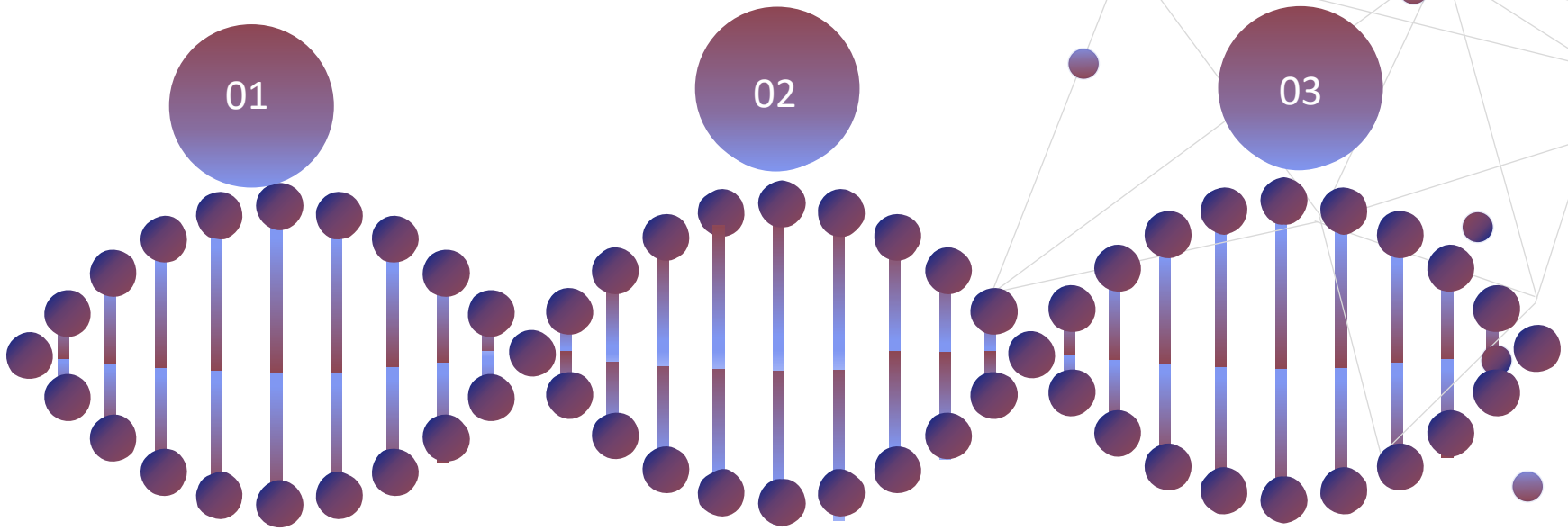
- Do service teams have end-to-end visibility of operations and infrastructure?
- Can problems be pre-empted proactively by monitoring enterprise-wide operations?
- Is machine generated data integrated with human intelligence to provide a comprehensive view of operations?
- Can IT operations be safeguarded based on past performance?

1. Embee's Predictive Service Intelligence(EPSI) is a next-generation predictive intelligence platform for your data center operations. It offers real-time, end-to-end visibility into an enterprise's operations, processes, and user experience through analysis of **continuous streaming generated data** to enhance the uptime of the systems. The tool can be used across devices and platforms, enabling the enterprise to minimize downtime and maximize operational productivity.
2. Predictive Service Intelligence prevents occurrence of critical business incidents due to infrastructure/applications issues through effective use of prescriptive and predictive analytics**.** It helps **identify event patterns and generate metrics**, optimizes service levels and minimizes critical business outages.
3. For instance, the platform's service intelligence capability helps predict CPU/IO wait state, network, and memory issues. It **monitors all generated events and removes false positives**, while highlighting the critical events. The platform also **predicts potential failures** of applications/infrastructure based on current events and historical behavior of systems in the enterprise, thereby, reducing critical incidents and leading to increased uptime.
4. The platform's service desk capability enables the enterprise to view the day-to-day functioning of IT operations, leading to improved transparency and high user experience. Predictive algorithms enable technicians **to pre-empt and resolve incidents** (Predictive Service Intelligence TVM). It communicates ticket resolution status through dynamic visualization and uses statistical models on past incidents to help assign accurate estimated time to resolve issues thereby improving customer satisfaction (Predictive Service Intelligence ETC).
5. Predictive Service Intelligence offers a customized self-help engine, the **Predictive Service Intelligence BOT**, which is an intelligent end user assistant. The feature provides inputs to the users for them to resolve the issues. Through the web-based personalized dashboard, the end user is updated on selected and completed tickets as well as the likely time to resolve the issues.
6. The feature identifies and notifies end users of system wide incidents and open tickets for the issue, **leading to quicker resolution** of tickets **and reduced number of overall tickets**.

Tools & Technologies

- Azure ML Studio
- Azure AI Builder
- Azure Cognitive services
  – Anomaly detector
  - Q&A maker
  - Key phrase extractor
- Azure stream
- Power BI
- Log Analytics Workspace
- Azure Sentinel
- Azure Active Directory
- Azure Infrastructure(VM, VNet)

DNA of EPSI



Developed for intelligent IT

Plugged in with the power of AI, ML & automation to ensure enterprise data center and cloud operations are managed intelligently with maximum uptime and less human efforts

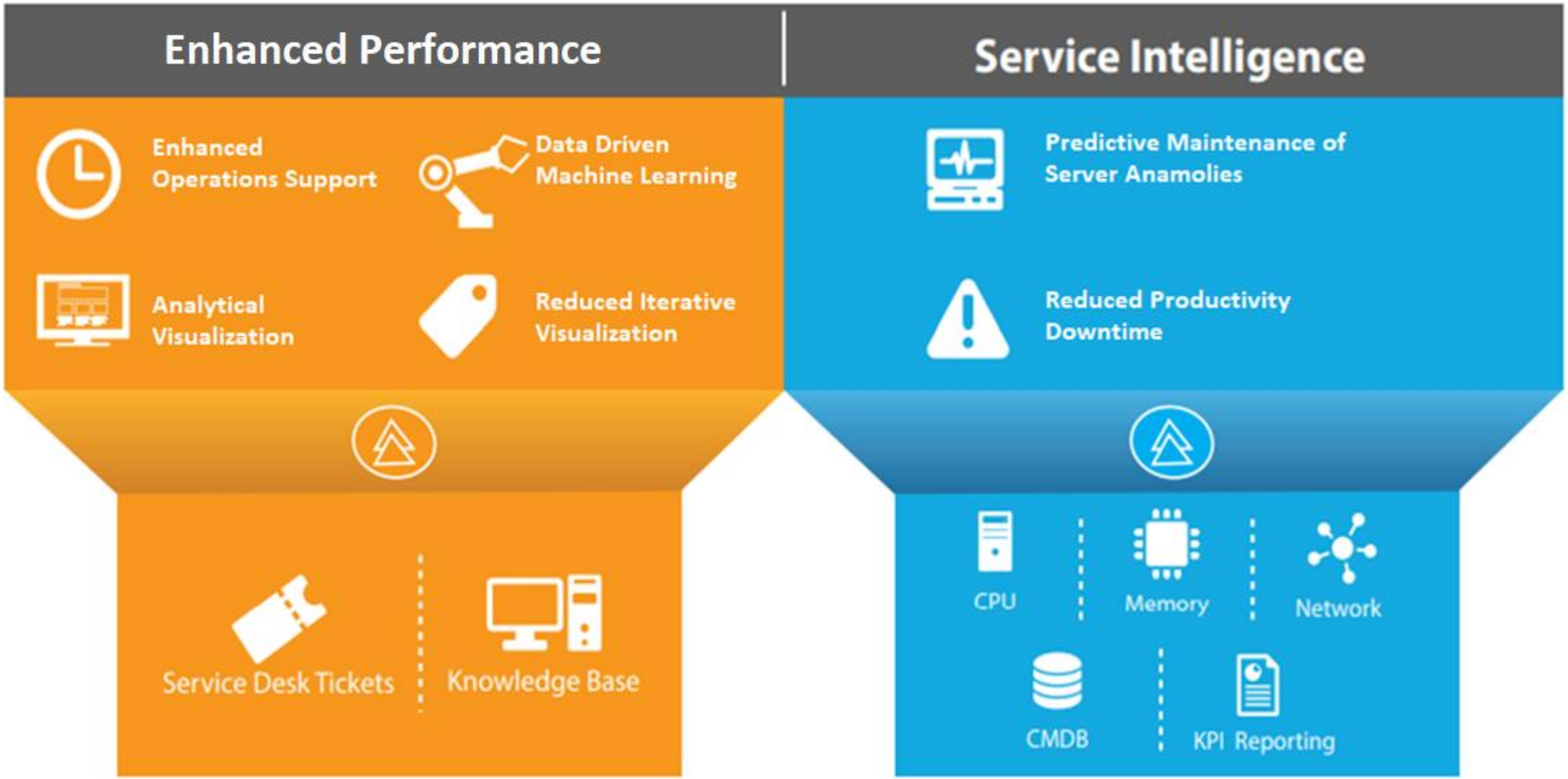
Mitigation & Adaptation

EPSI is built for Enterprises to simplify tasks like IT based operational challenges, requests & issue management for continuous monitoring and controlling IT operations

Built to perform Services, Extra

EPSI can be implemented within 1-2 weeks by our Embee feisty team.It's built for the 'Doers', the 'Go-getters' to simplify complex IT operations.

Objectives


Enhanced Performance
Service Intelligence
Enhanced Operations Support
Data Driven Machine Learning
Predictive Maintenance of Server Anamolies
Analytical Visualization
Reduced Iterative Visualization
Reduced Productivity Downtime
Service Desk Tickets
Knowledge Base
CPU
Memory
Network
CMDB
KPI Reporting

Our purpose

Why EPSI? [For Infrastructure]

Improved monitoring & automating

With ticket management system the app is ready to respond with an ML bot that saves the human engagements to resolve the user queries

360-degree maintenance of IT Infrastructure

Connecting EPSI with power BI helps in decision making especially regarding security, optimisation and resource utilization.

Saves time

The power of AI & automation ensures the infrastructure is well maintained and the IT support is provided at regular intervals

Instant information about anonymous activity

Continuously monitor user login details to identify suspicious logins, windows events, sign-in history of the user to enhance the performance of the server

Improved communication

Instant support from the ML bot to follow up on any tickets or issues. Get instant clarification from the bot

Enhances Over Time

EPSI enhances the operational data with machine learning expertise which is learnt over the time that makes the system Robust and Reliable

01 **Improve planning & Decision making**

02 **360 view of Infrastructure Management**

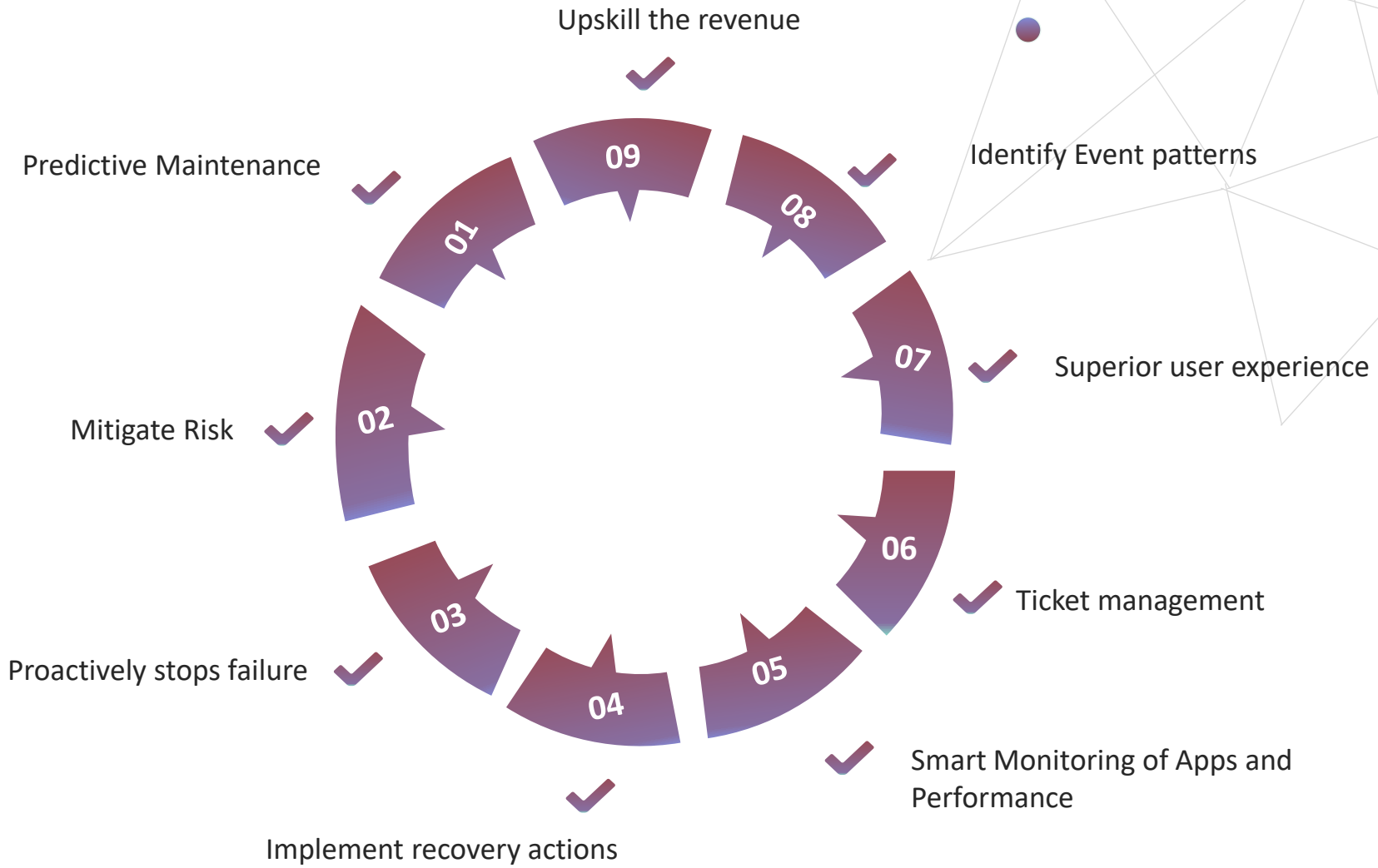
03 **Saves time and manpower**

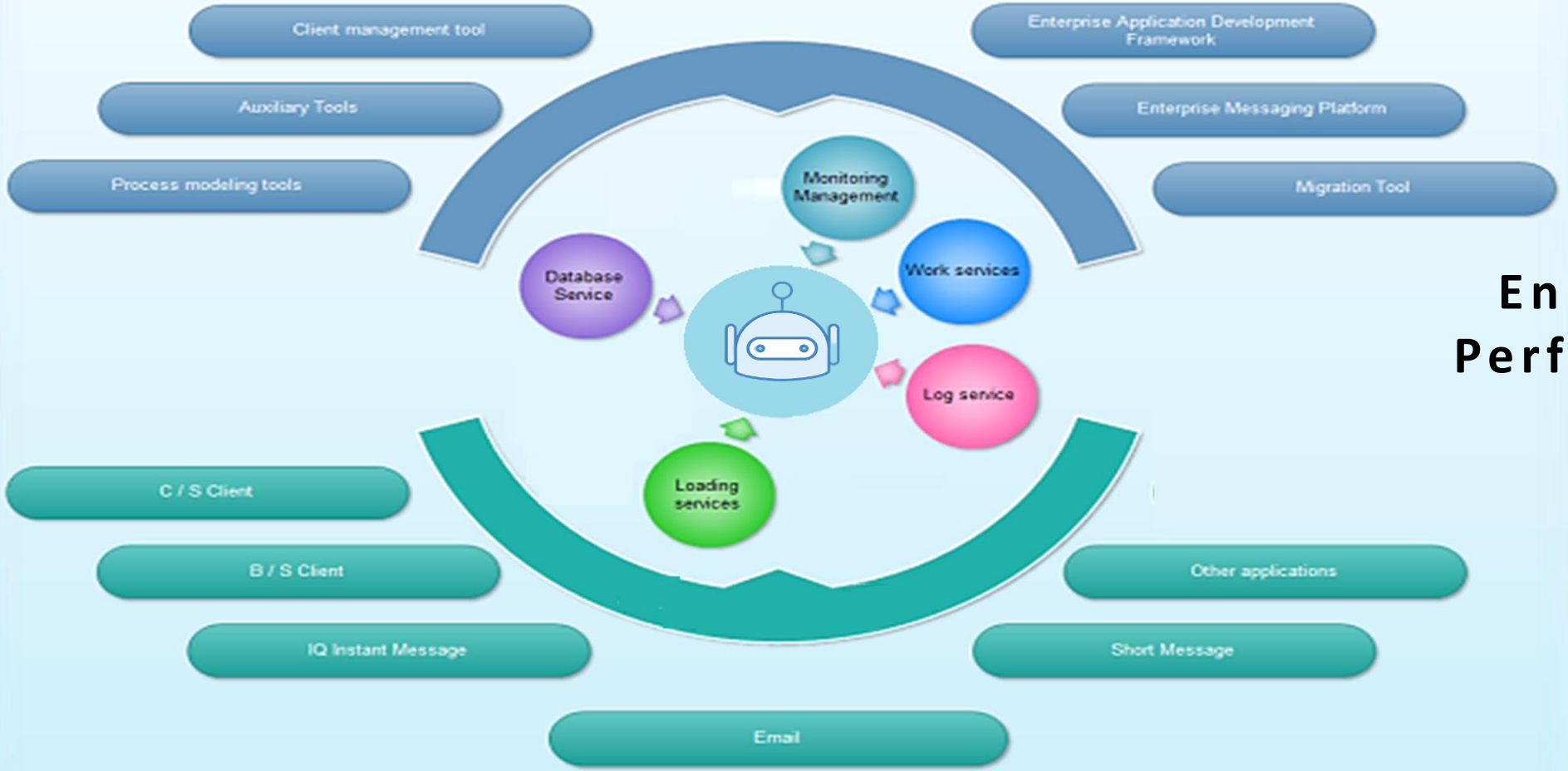
04 **Instant update about any anonymous activity**

05 **Improved communication**

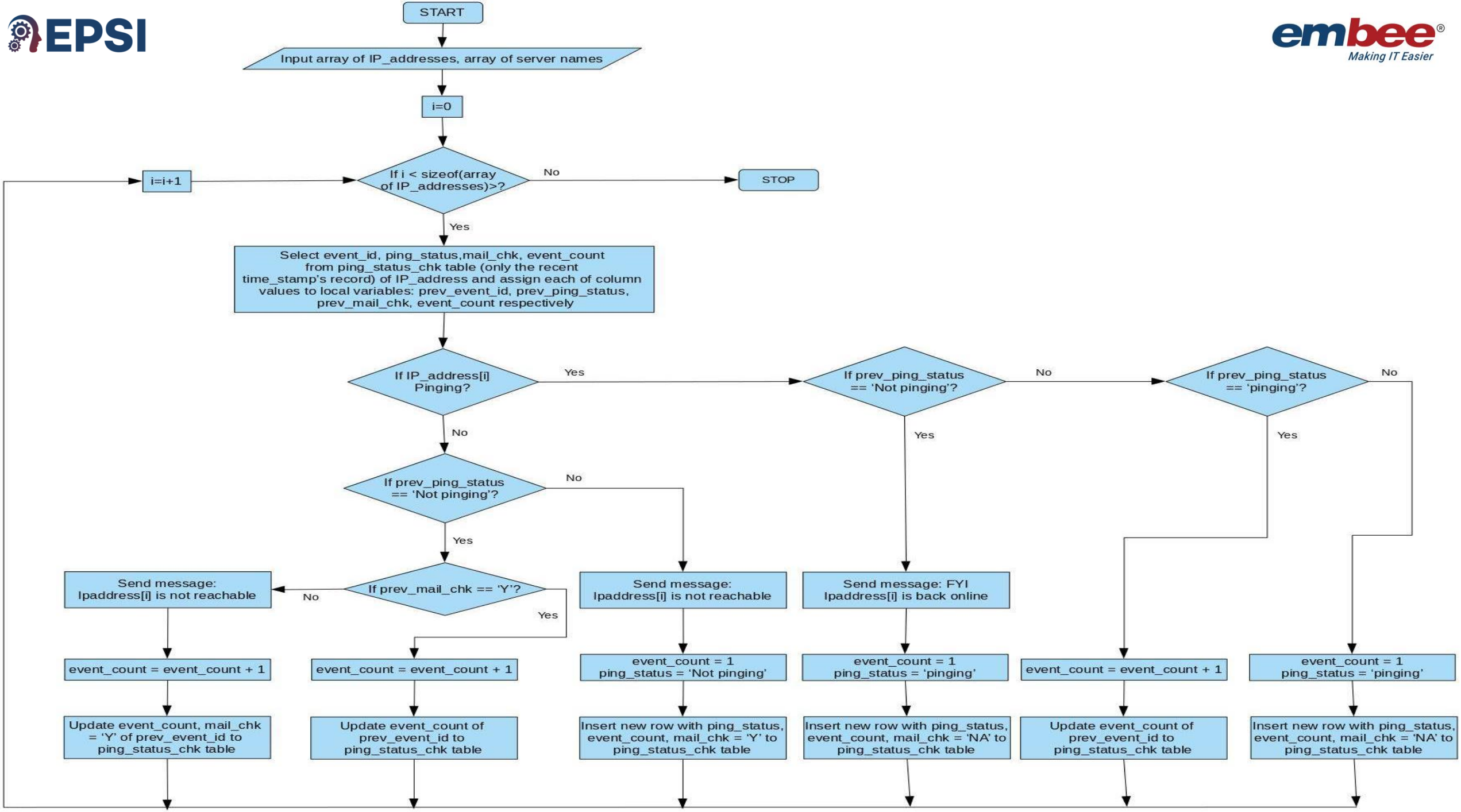
06 **Machine learning strategy on developing intelligence**

Building The Future of Automation, Brick by Brick

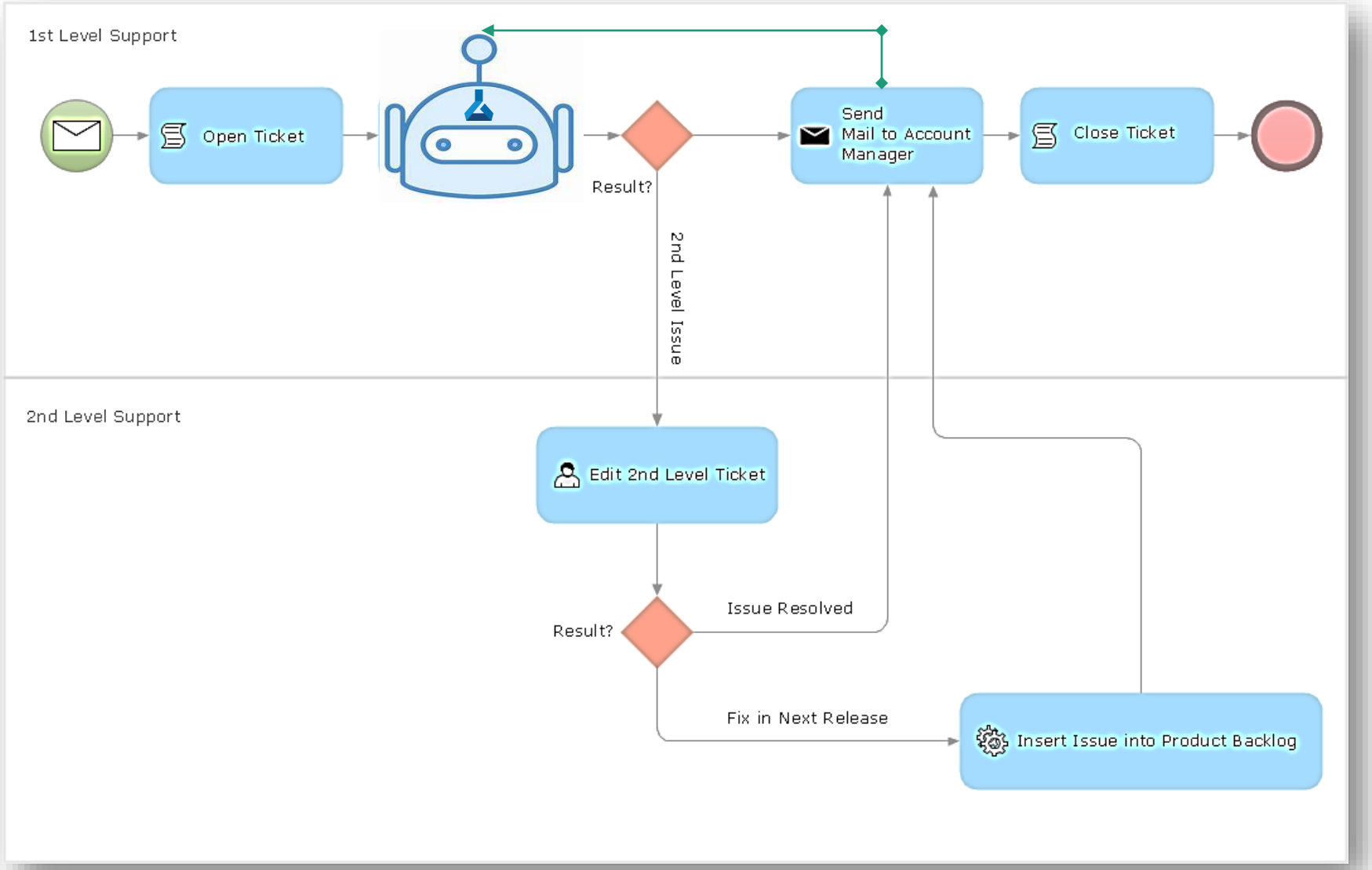


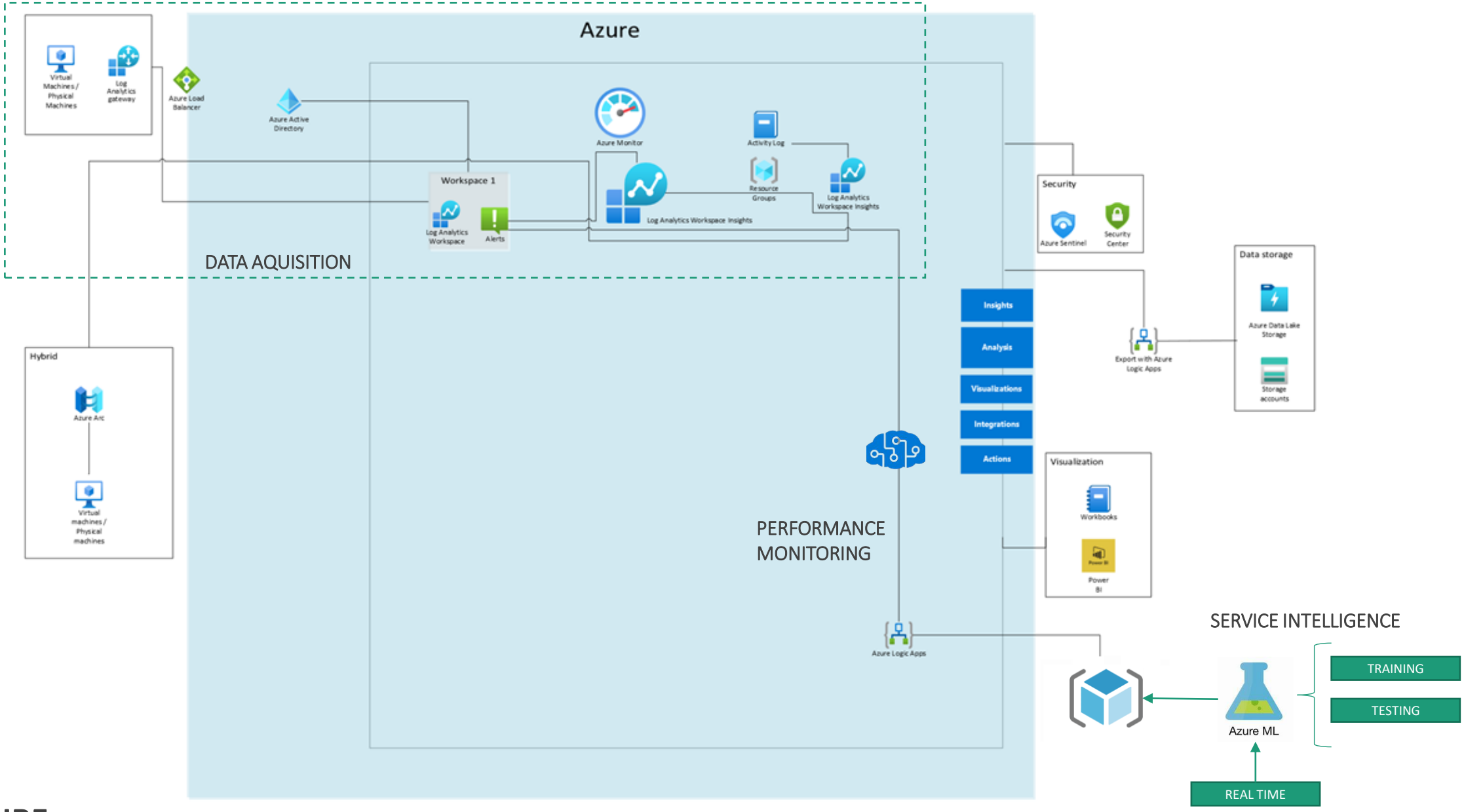


Enhanced Performance


START
Input array of IP_addresses, array of server names
i=0
If i < sizeof(array of IP_addresses)>?
No
STOP
Yes
i=i+1
Select event_id, ping_status,mail_chk, event_count from ping_status_chk table (only the recent time_stamp's record) of IP_address and assign each of column values to local variables: prev_event_id, prev_ping_status, prev_mail_chk, event_count respectively
If IP_address[i] Pinging?
Yes
No
If prev_ping_status == 'Not pinging'?
No
Yes
If prev_mail_chk == 'Y'?
No
Yes
If prev_ping_status == 'Not pinging'?
Yes
No
If prev_ping_status == 'pinging'?
Yes
No
Send message: Ipaddress[i] is not reachable
event_count = event_count + 1
Update event_count, mail_chk = 'Y' of prev_event_id to ping_status_chk table
event_count = event_count + 1
Update event_count of prev_event_id to ping_status_chk table
Send message: Ipaddress[i] is not reachable
event_count = 1 ping_status = 'Not pinging'
Insert new row with ping_status, event_count, mail_chk = 'Y' to ping_status_chk table
Send message: FYI Ipaddress[i] is back online
event_count = 1 ping_status = 'pinging'
Insert new row with ping_status, event_count, mail_chk = 'NA' to ping_status_chk table
event_count = event_count + 1
Update event_count of prev_event_id to ping_status_chk table
event_count = 1 ping_status = 'pinging'
Insert new row with ping_status, event_count, mail_chk = 'NA' to ping_status_chk table

Service Intelligence Flow





SOLUTION ARCHITECTURE

EPSI

Nothing but the best

embee
Making IT Easier

Launching with the Power of Azure

01 Azure Automation

02 Azure Virtual Machine

03 Azure Firewall/NGFW

04 Azure Defender & Sentinel

05 Log Analytics

06 Logic Apps

07 Azure File Share/
NetApps with FSLogix

PowerApps and AI builder

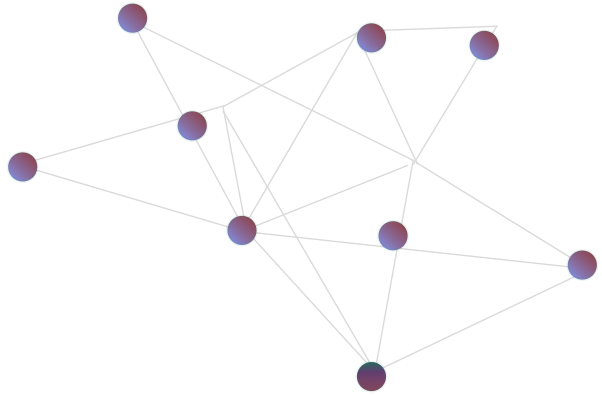
From PowerApps user will raise the ticket, and the data will save to SharePoint custom list

Using AI builder, we can generate Adaptive responses for Detections on server and ticket management systems

Users can check the notification and using the hyperlink in Adaptive card they can directly access the application and they take respective action for that ticket. AI builder with its supervised learning capability it builds the adaptive methodology

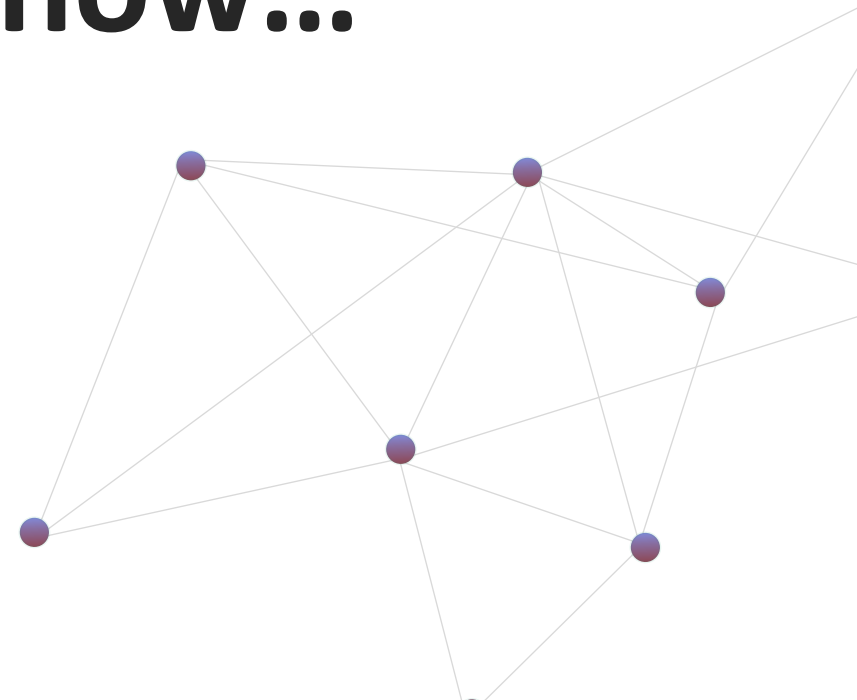
EPSI

embee
Making IT Easier

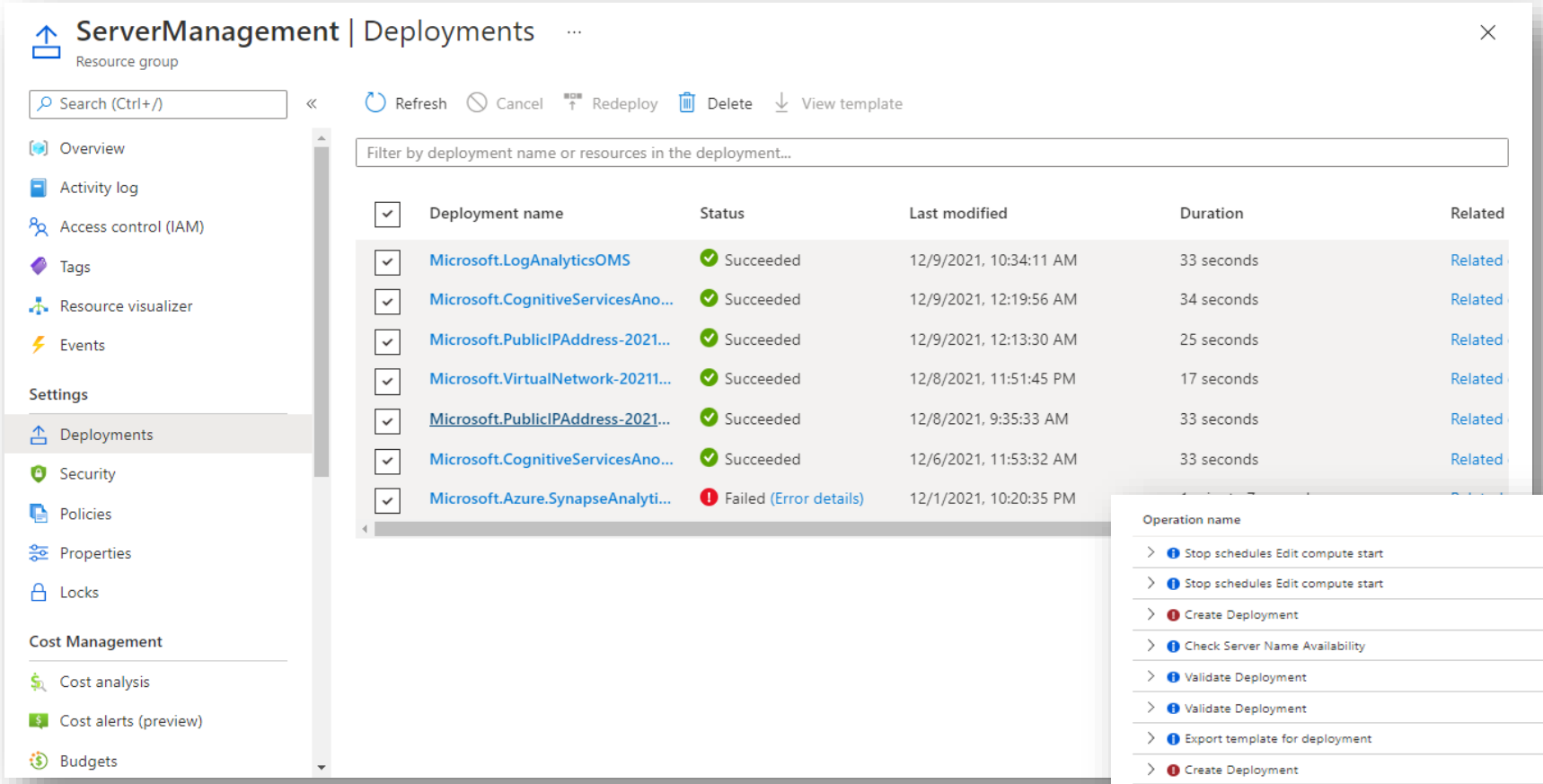


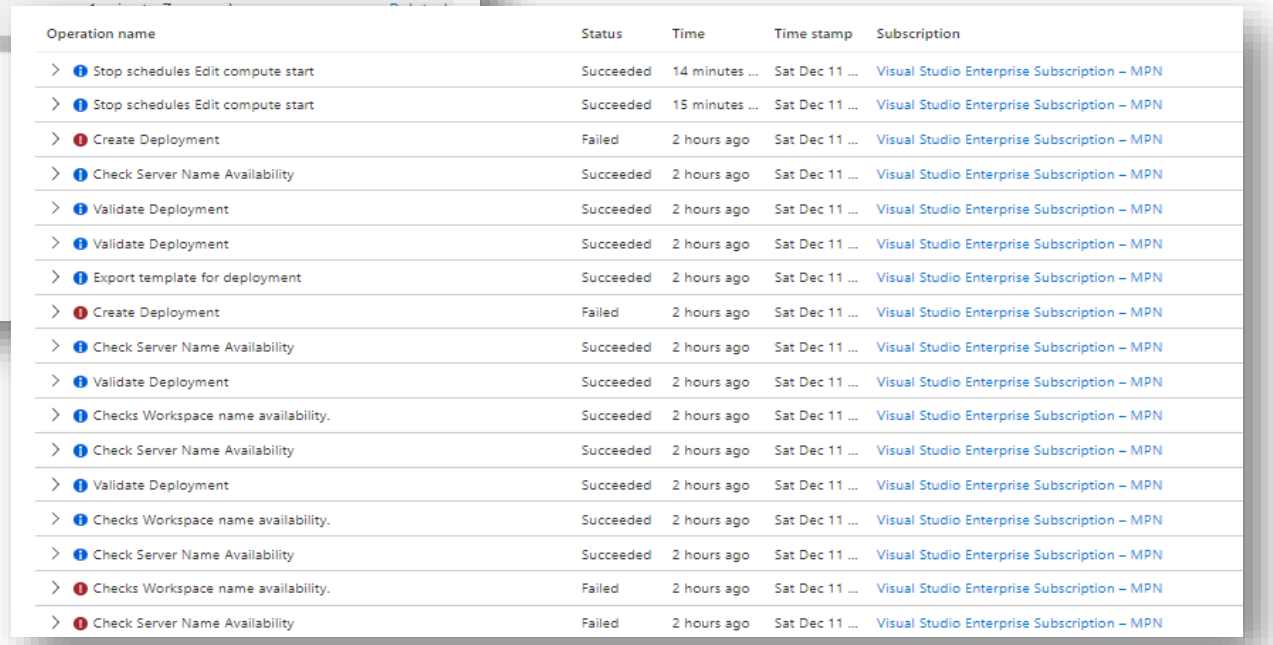
Experience the power of organized

The demo begins now…



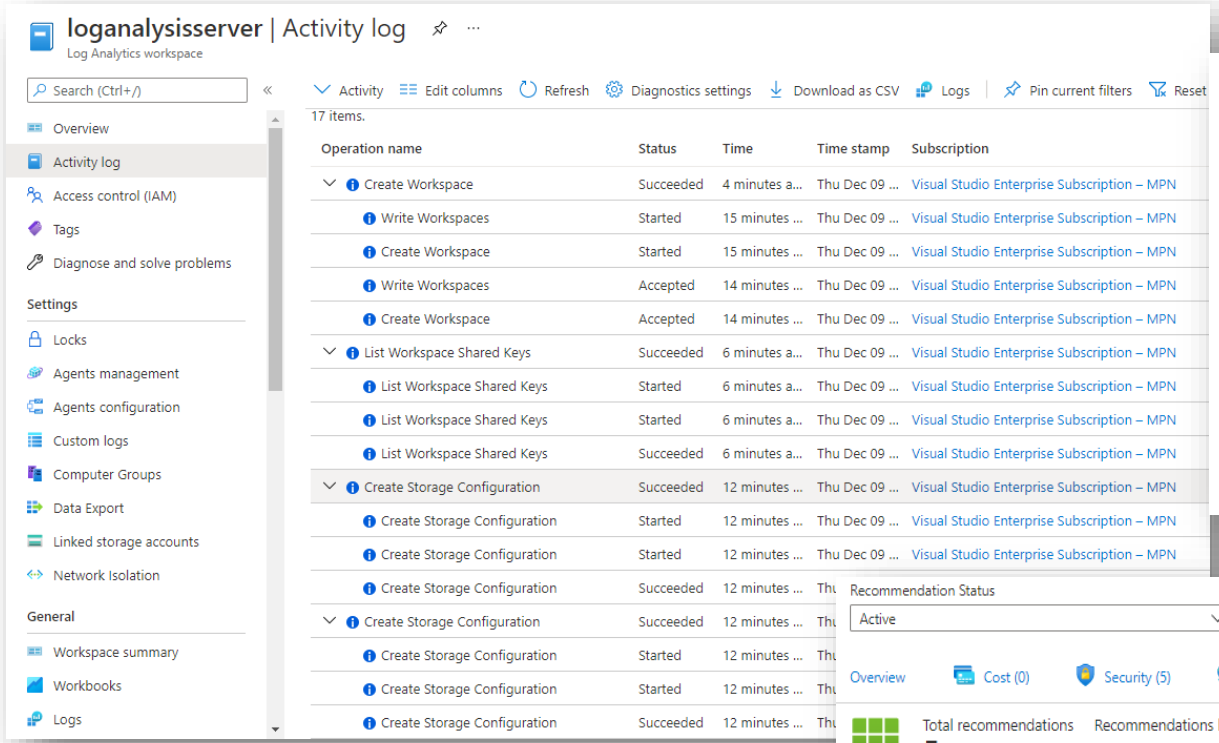
Server Adaption & Logs

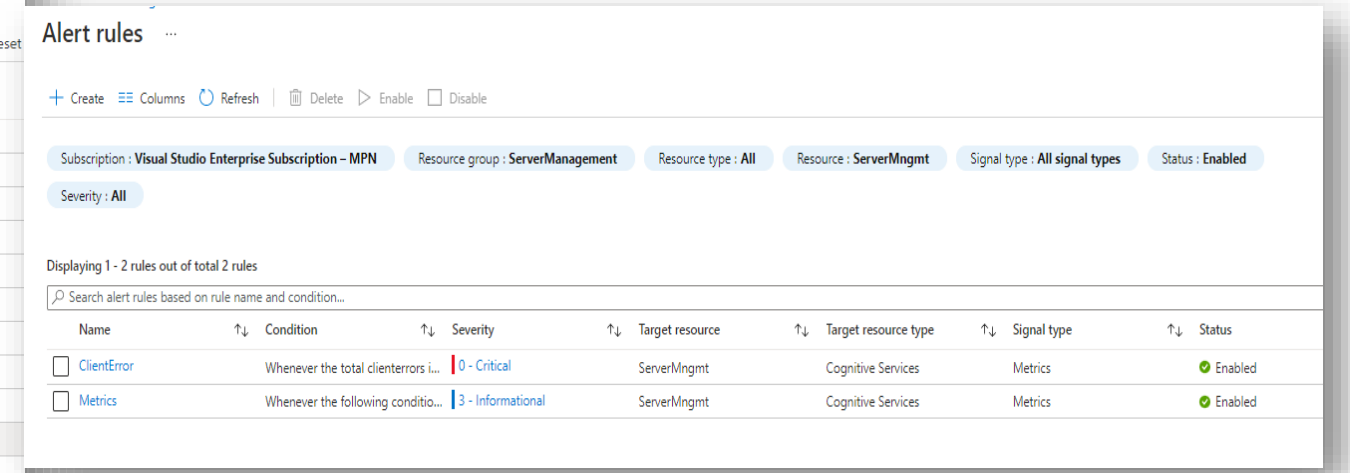


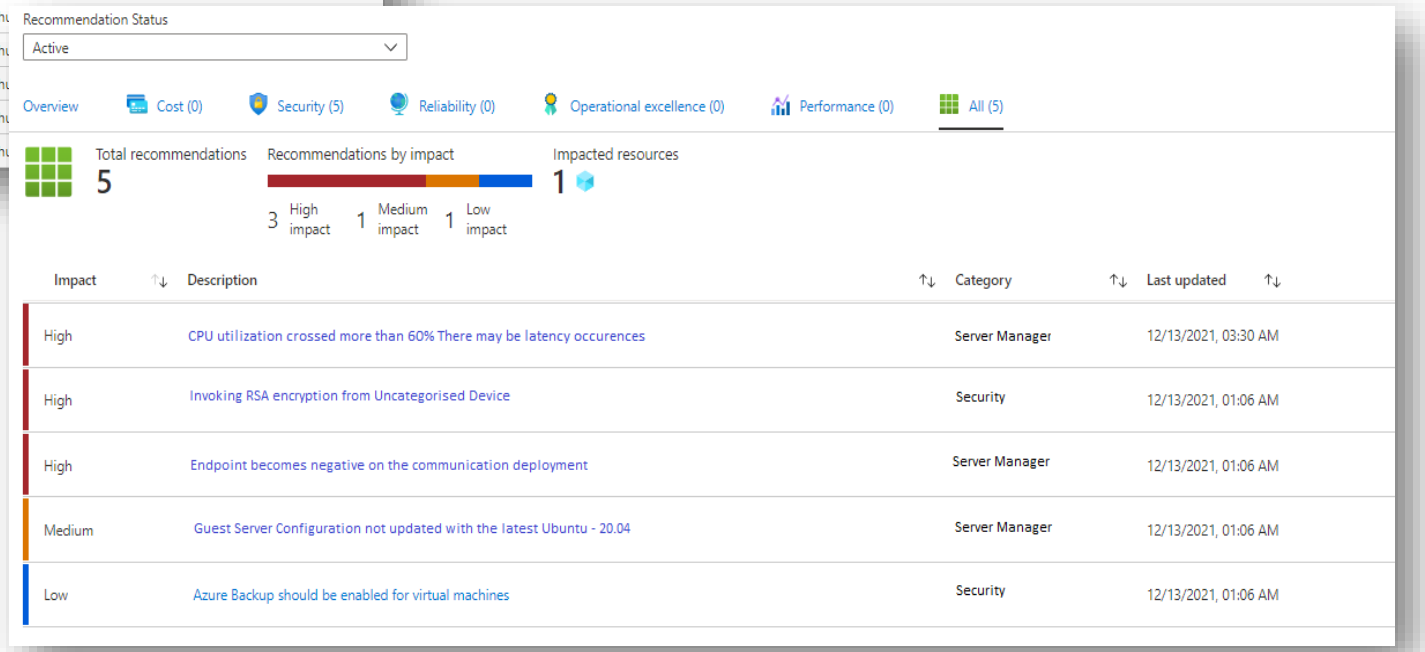


EPSI

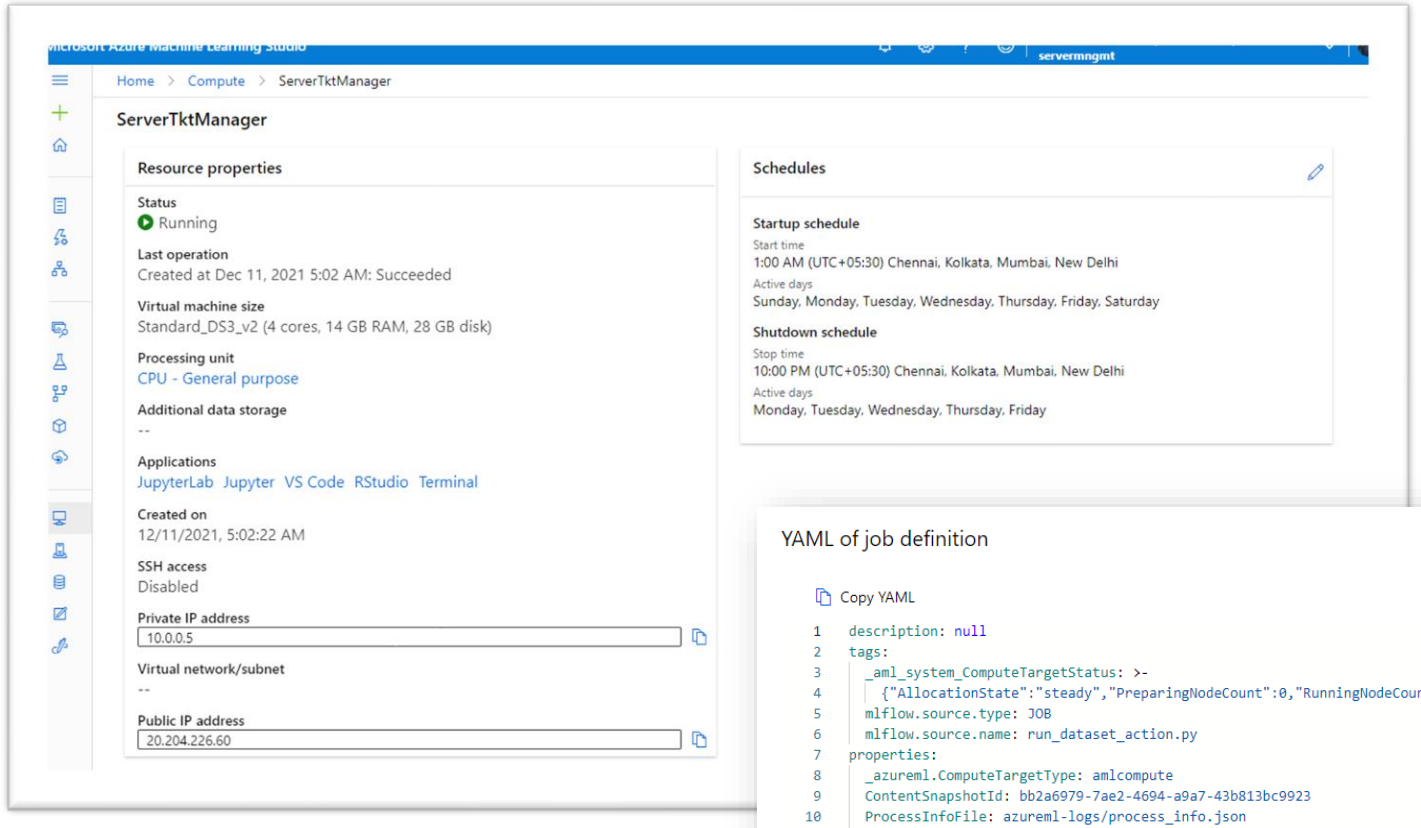
embee Making IT Easier

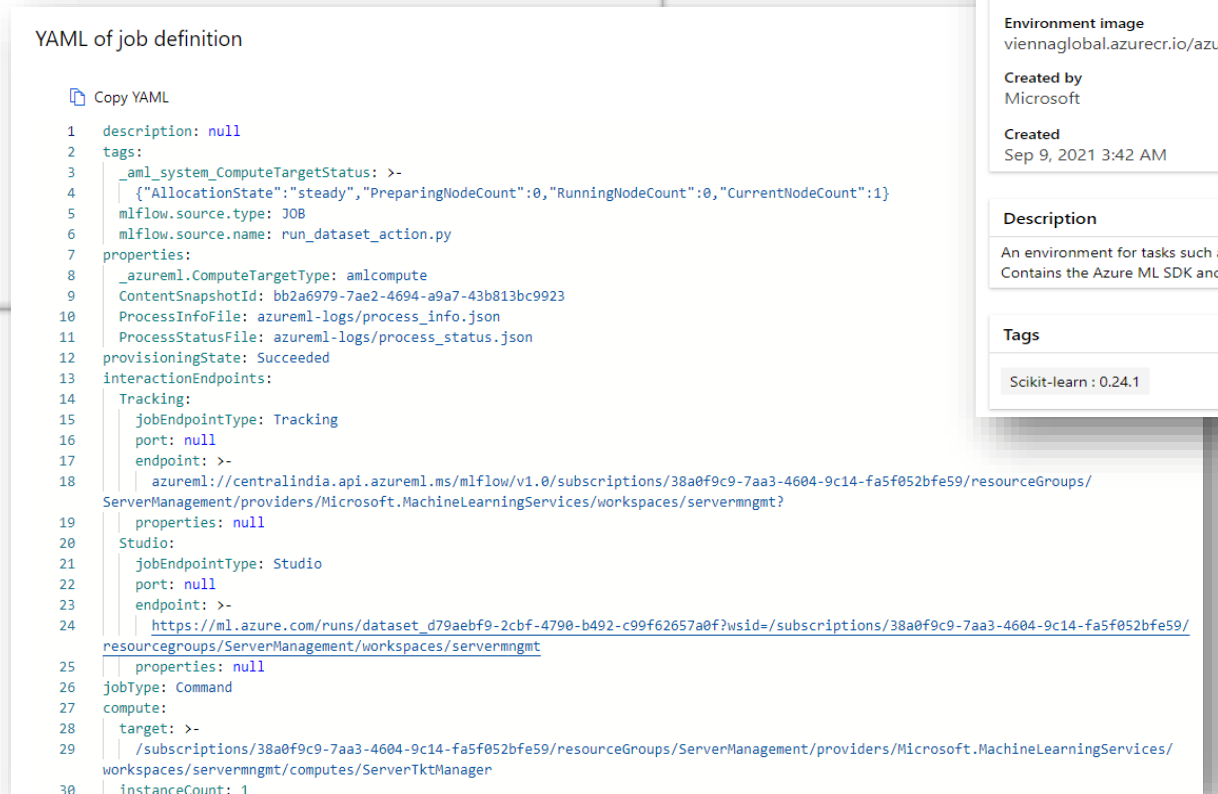


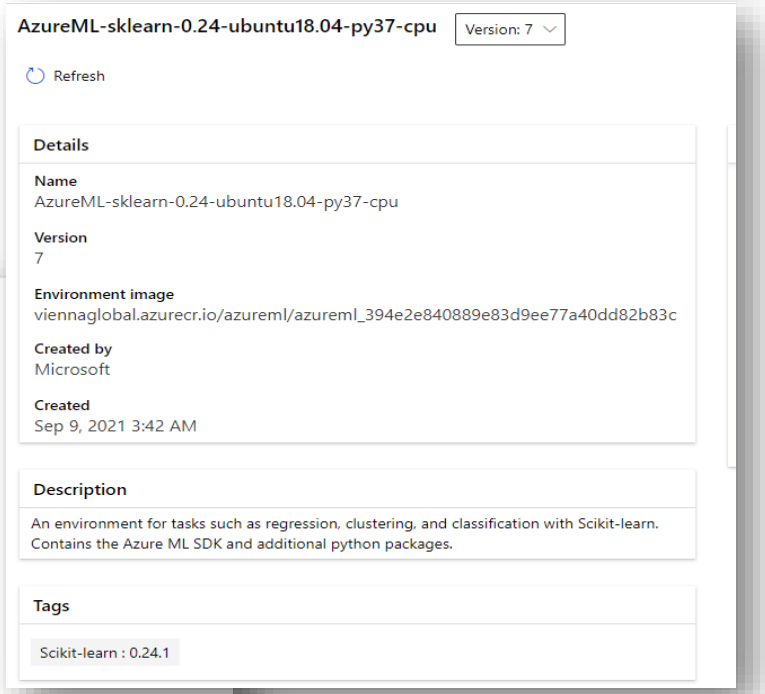




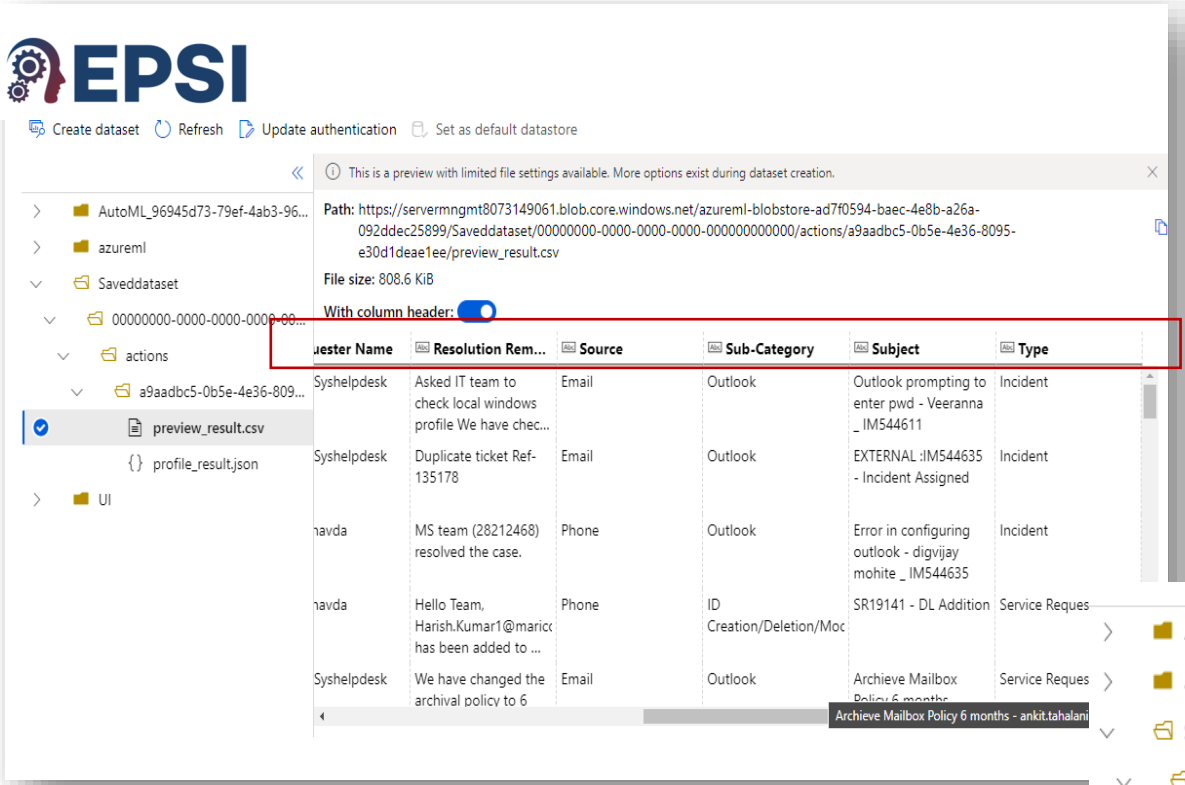
Performance Recommendation



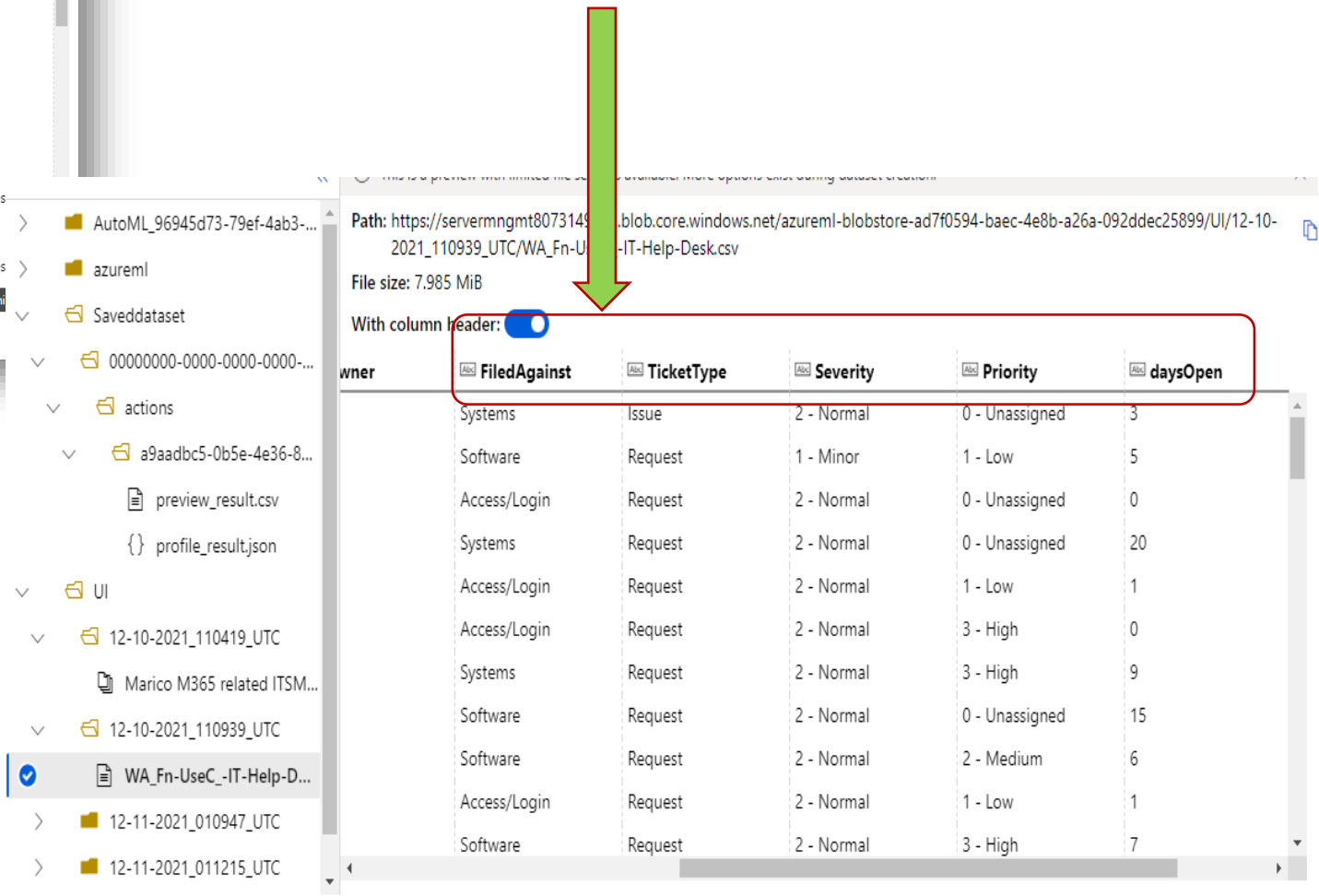




ML Deployment



Captured End points



Machine Learning Blob

```
f.isnull().sum())
'''
ticketDf['Satisfaction'].replace(to_replace='0 - Unknown',value=0,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='1 - Unsatisfied',value=0,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='2 - Satisfied',value=1,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='3 - Highly satisfied',value=1,inplace=True)
'''
ticketDf['Satisfaction'].replace(to_replace='0 - Unknown',value=0,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='1 - Unsatisfied',value=1,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='2 - Satisfied',value=2,inplace=True)
ticketDf['Satisfaction'].replace(to_replace='3 - Highly satisfied',value=3,inplace=True)

ticketDf['Severity'].replace(to_replace='0 - Unclassified',value=0,inplace=True)
ticketDf['Severity'].replace(to_replace='1 - Minor',value=1,inplace=True)
ticketDf['Severity'].replace(to_replace='2 - Normal',value=2,inplace=True)
ticketDf['Severity'].replace(to_replace='3 - Major',value=3,inplace=True)
ticketDf['Severity'].replace(to_replace='4 - Critical',value=4,inplace=True)


ticketDf["daysOpen"] = pd.cut(ticketDf["daysOpen"],bins=5)

dummiesDf = pd.get_dummies(ticketDf)
dummiesDf.head(30)
plot.figure(figsize=(15,10))
dummiesDf.corr()['Satisfaction'].sort_values(ascending=False).plot(kind='bar')

# Conclusion: as per correlation, Severty_3 major, ITowner, Severty_4 critical  positively c
# Whereas, DaysOpen and Severty_2 Minor negetively correlated with Satisfaction
```

General

Datastore name
workspaceblobstore

Datastore type
Azure Blob Storage

Created by

Subscription ID
38a0f9c9-7aa3-4604-9c14-fa5f052bfe59

Resource group name
servermanagement

Protocol
https

Endpoint
core.windows.net

Account name
servermngmt8073149061

Blob container
azureml-blobstore-ad7f0594-baec-4e8b-a26a-092ddec25899

Data URL
https://servermngmt8073149061.blob.core.windows.net/azureml-blobstore-ad7f0594-baec-4e8b-a26a-092ddec25899

Created on
Dec 11, 2021 4:30 AM

Data Labels

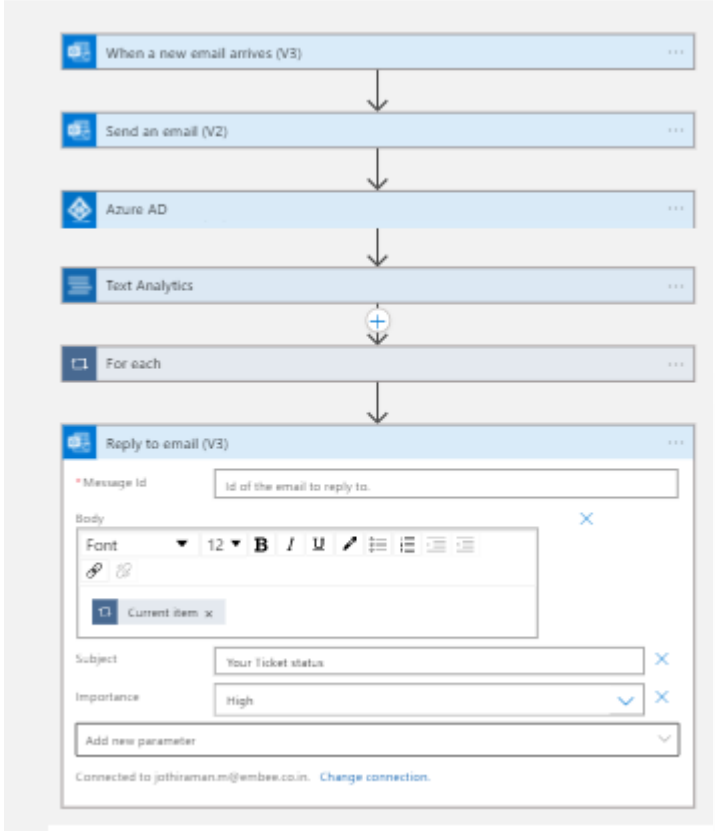
Data Labeling

+ Add project Refresh Delete

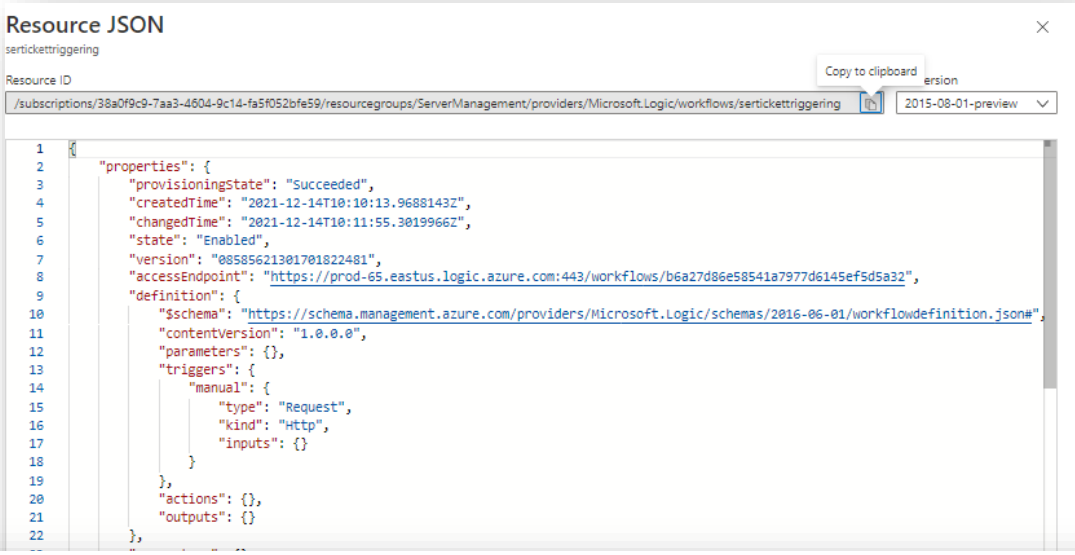
Project name	Label data	Progress	Type	State	Created on ↓	Created by
MachineLearningTicket		16/16	Object Identification (Bounding...	Passed	Dec 09, 2021 8:41 PM	Jothiraman M

Email trigger using Logic App

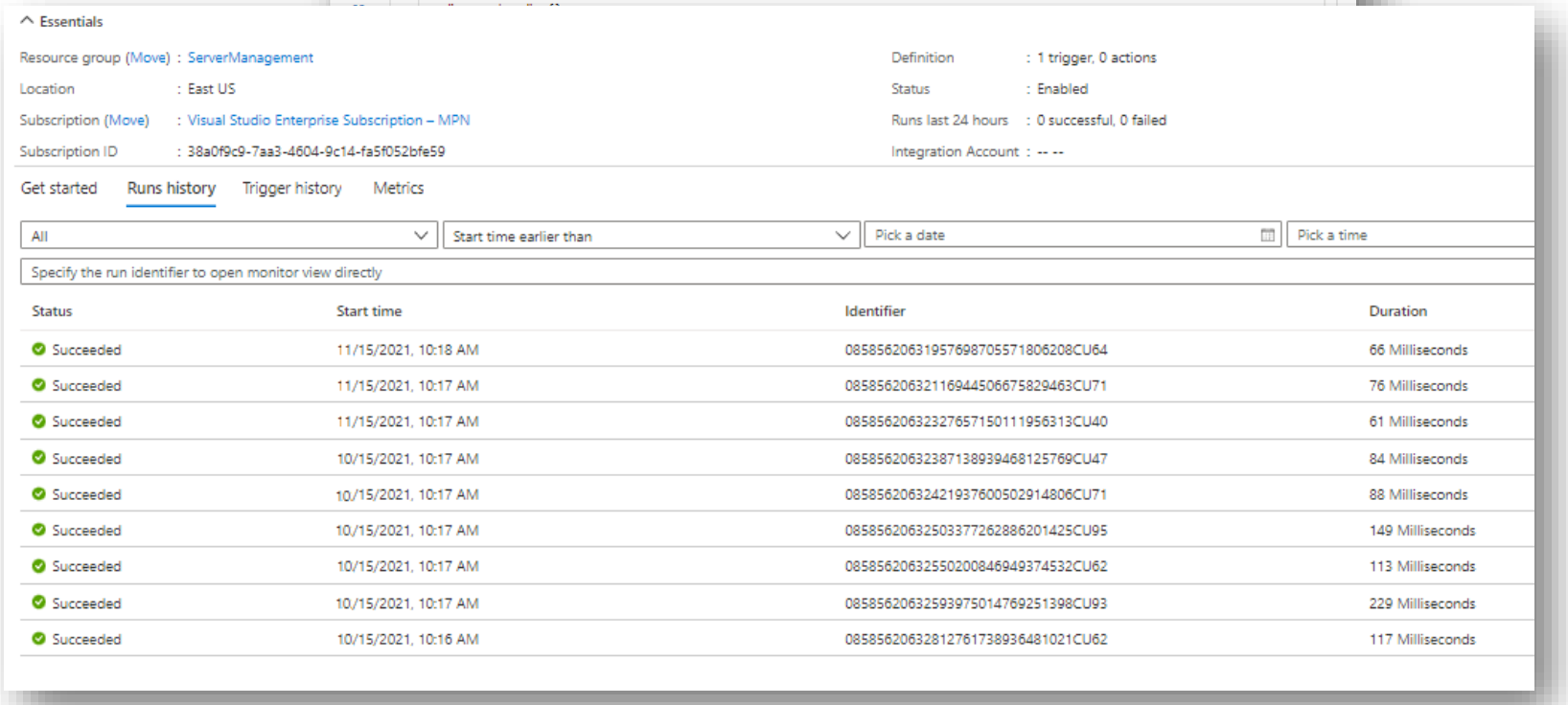
Logic App Configuration



Json view

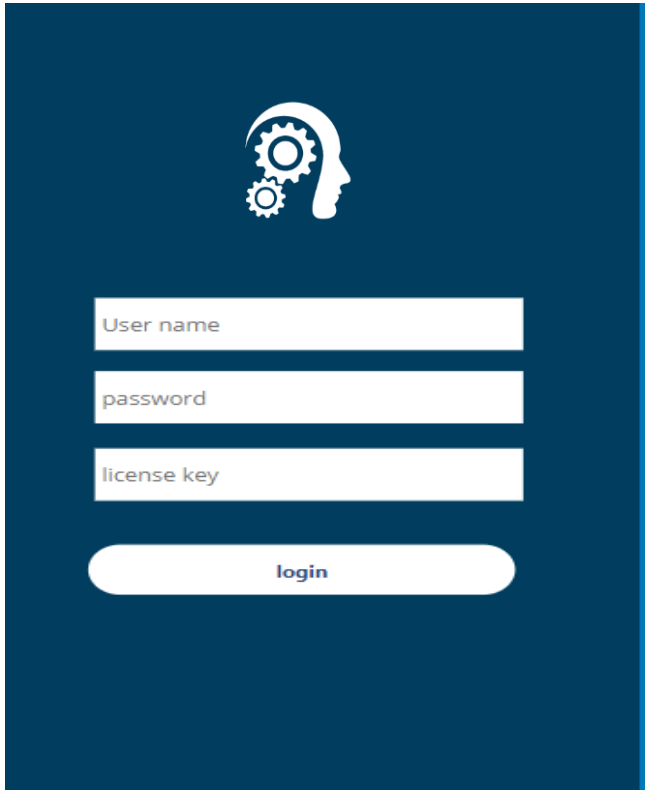


Status log

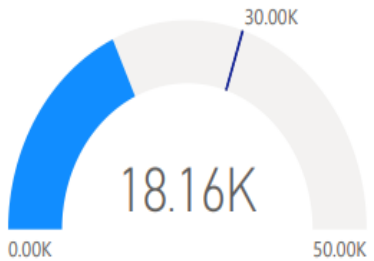


Experience the power of organized

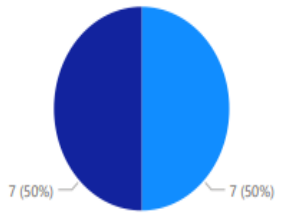
User Perspective



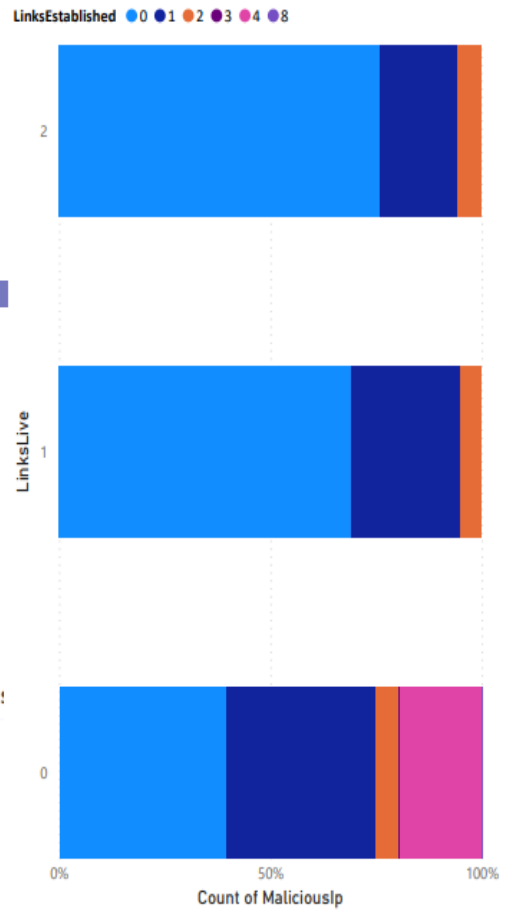
Cpu Speed



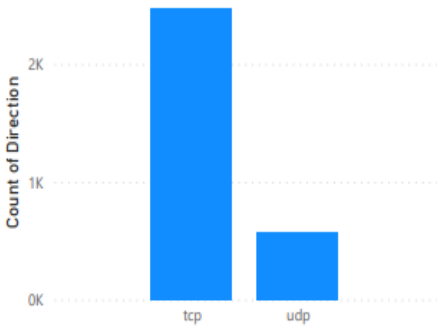
IPv4 vs IPv6



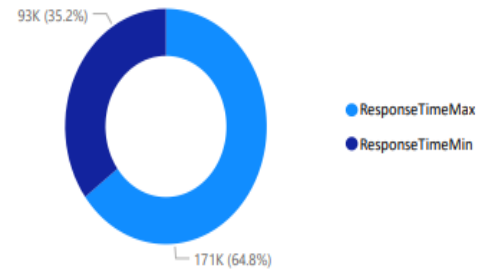
Malicious IP vs Link Establishment



Count of Direction by Protocol

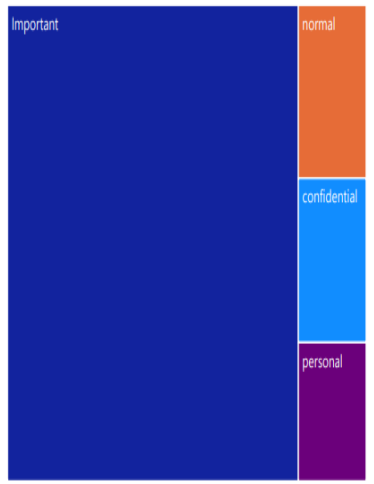


Links VS Malicious IP

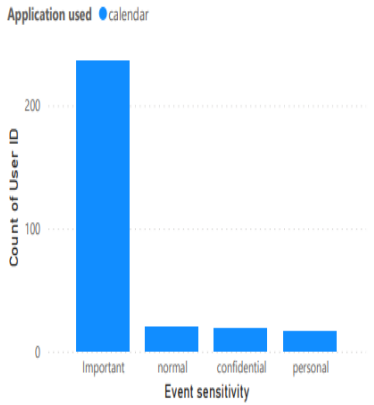


SourceSystem TenantId	OpsManager ResponseTimeMax	ResponseTimeMin	Severity	**Total** **ResponseTimeMax**	**ResponseTimeMin**
cb52fafe-6705-4d70-b5db-1e5b3c306a3e	171346	93066		**171346**	**93066**
Total	**171346**	**93066**		**171346**	**93066**

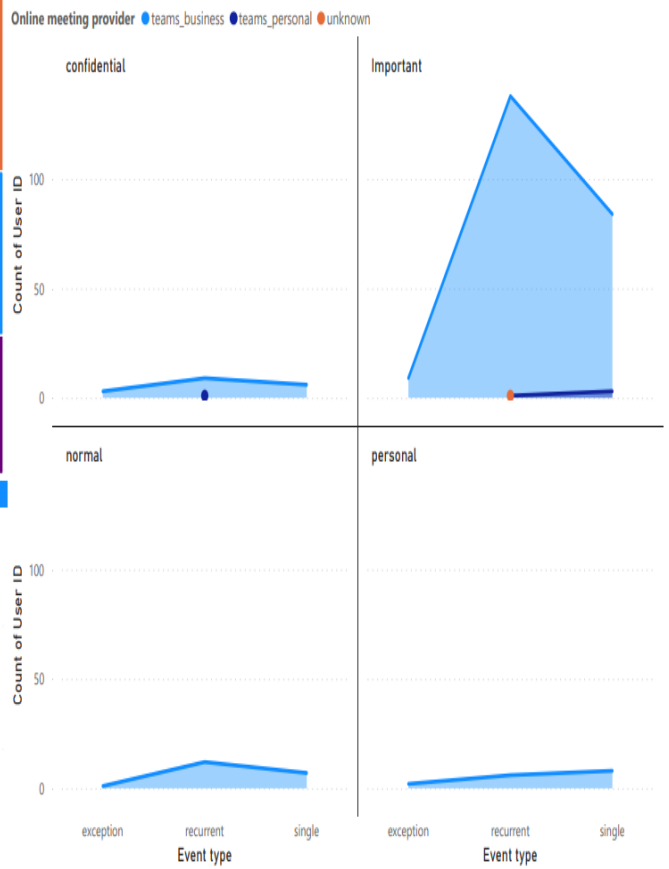
Count of User ID by Event sensitivity

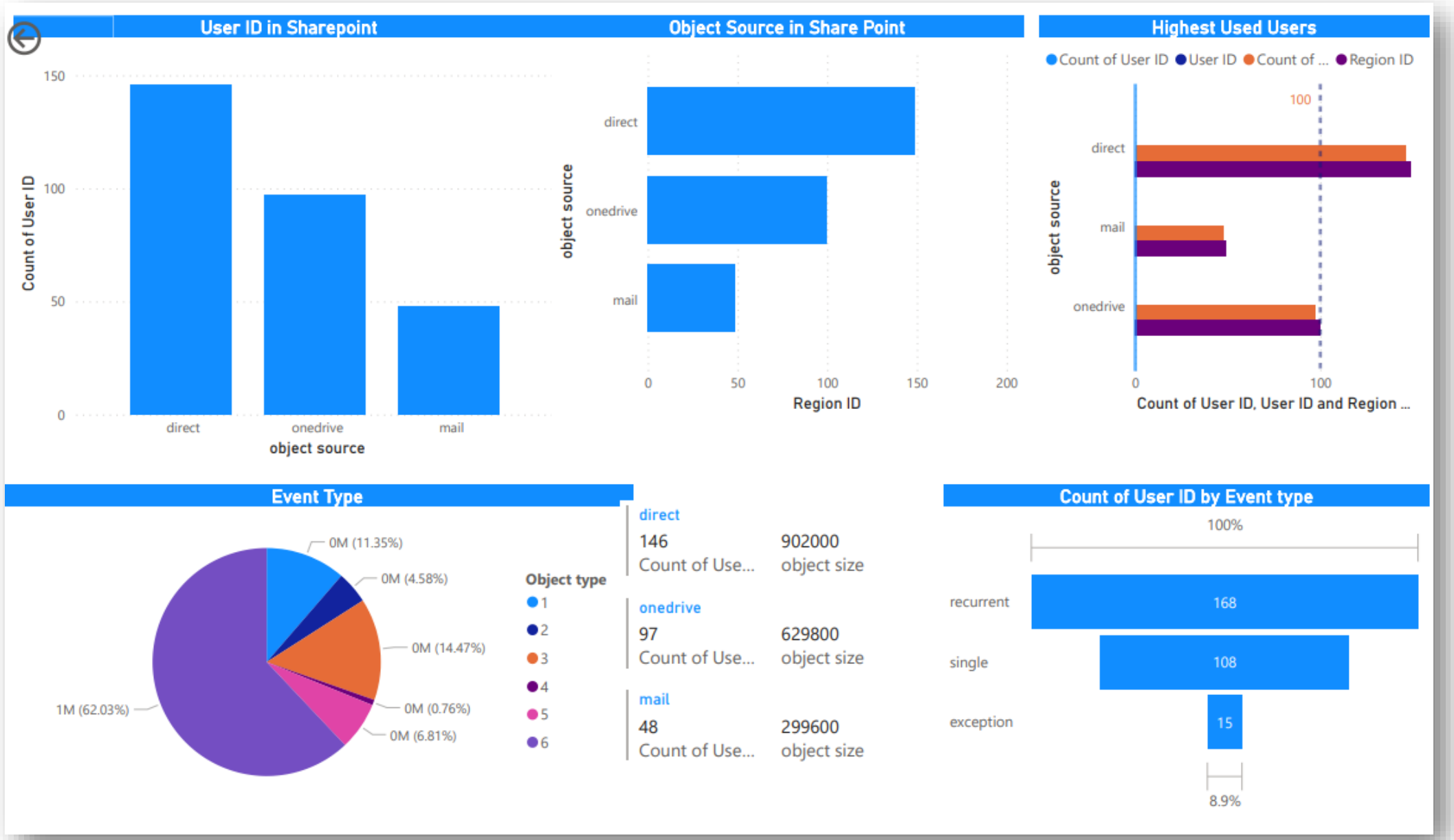


Event Sensitivity

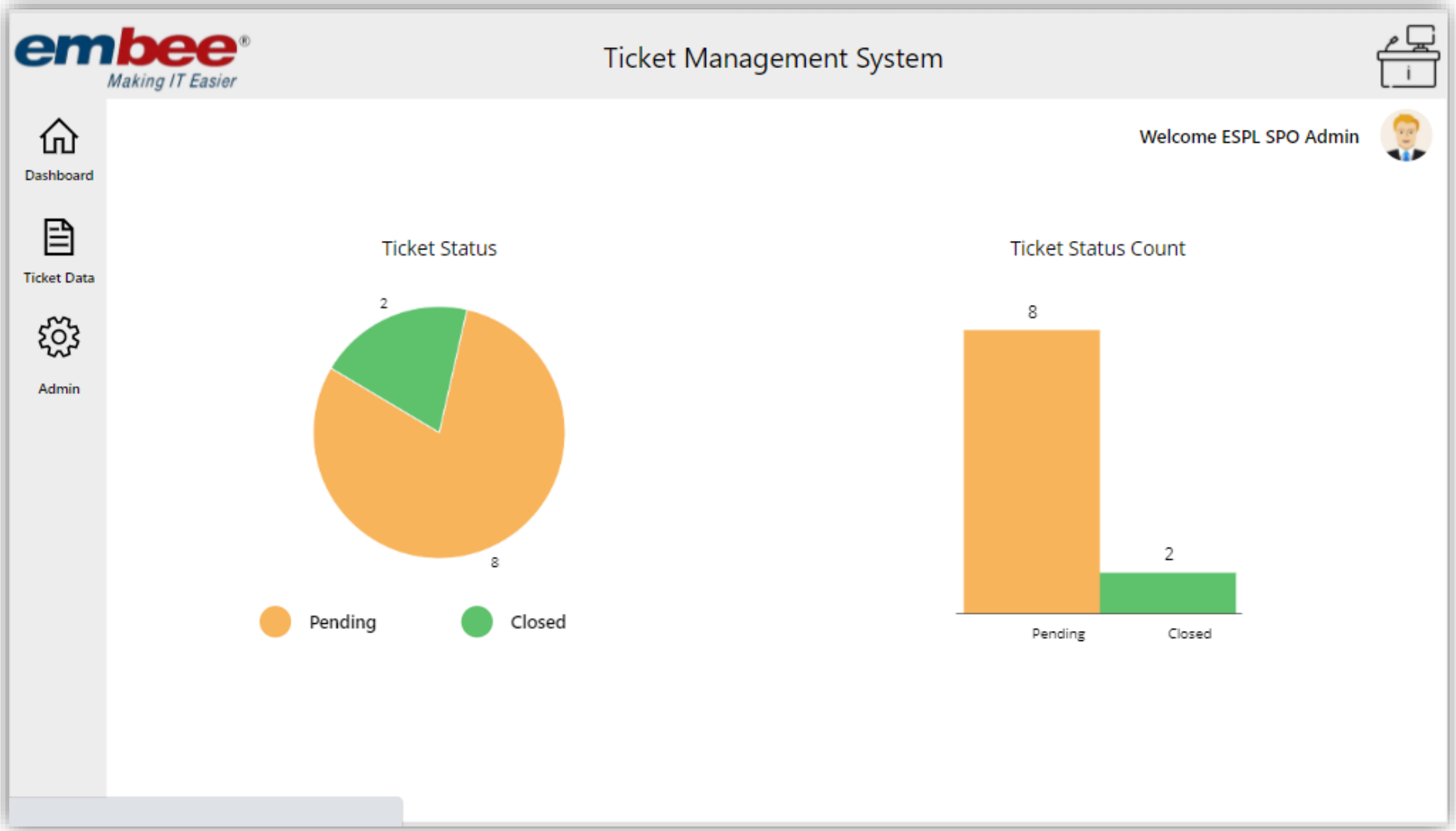


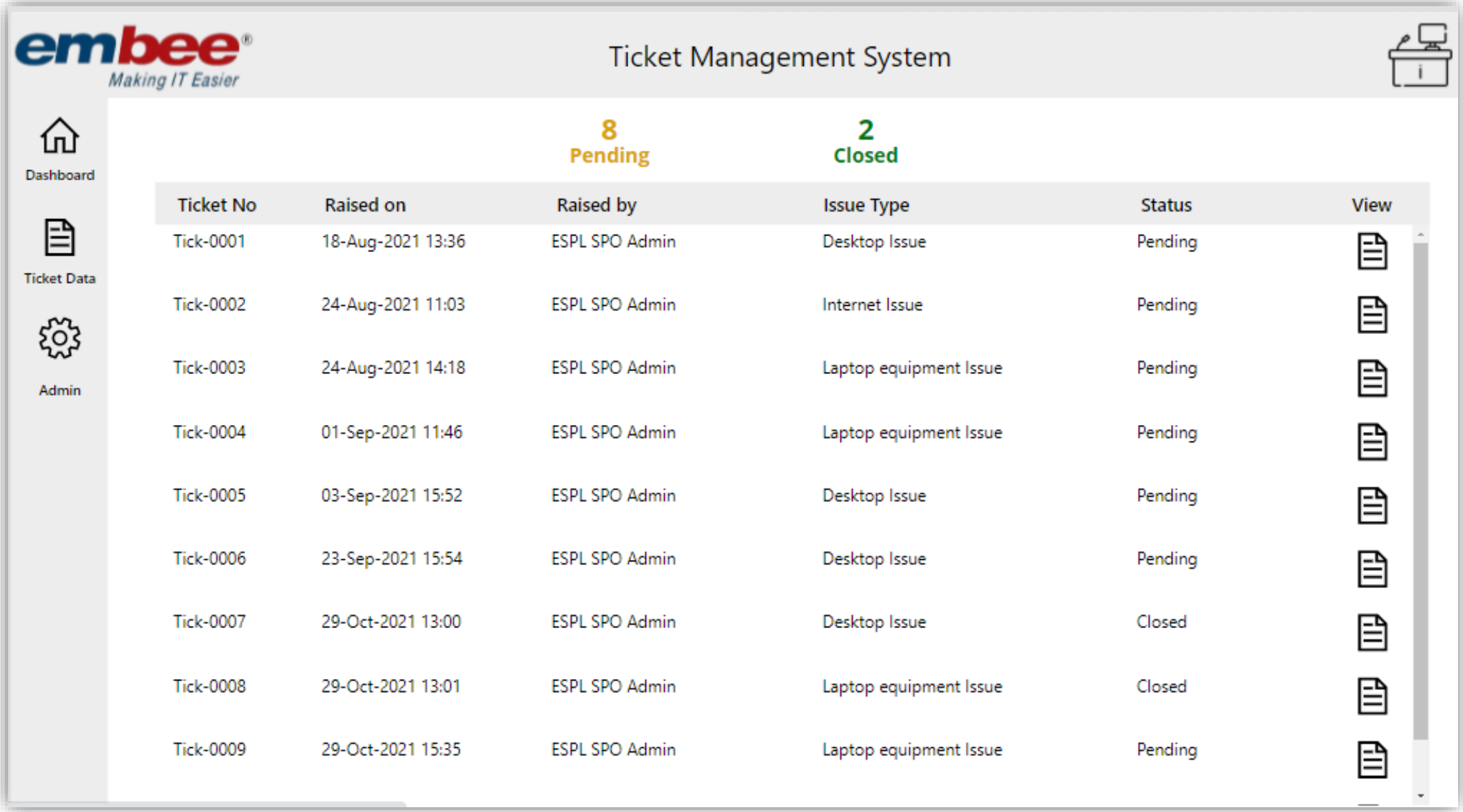
Timezones Vs User utilization



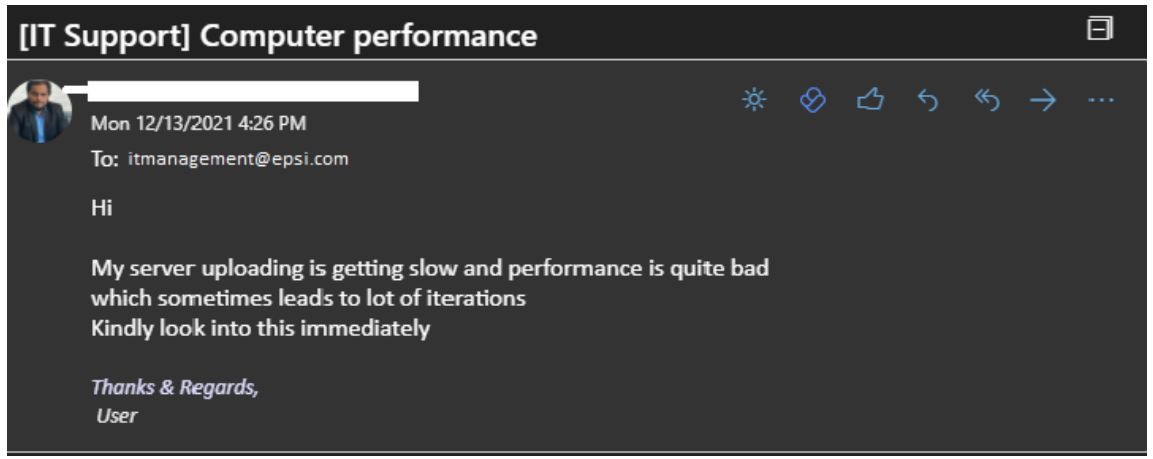

User ID in Sharepoint
Count of User ID
150
100
50
0
direct
onedrive
mail
object source
Object Source in Share Point
object source
direct
onedrive
mail
0
50
100
150
200
Region ID
Highest Used Users
Count of User ID
User ID
Count of ...
Region ID
100
direct
mail
onedrive
object source
0
100
Count of User ID, User ID and Region ...
Event Type
0M (11.35%)
0M (4.58%)
0M (14.47%)
0M (0.76%)
0M (6.81%)
1M (62.03%)
Object type
1
2
3
4
5
6
direct
146
Count of Use...
902000
object size
onedrive
97
Count of Use...
629800
object size
mail
48
Count of Use...
299600
object size
Count of User ID by Event type
100%
recurrent
168
single
108
exception
15
8.9%

SERVICE INTELLIGENCE

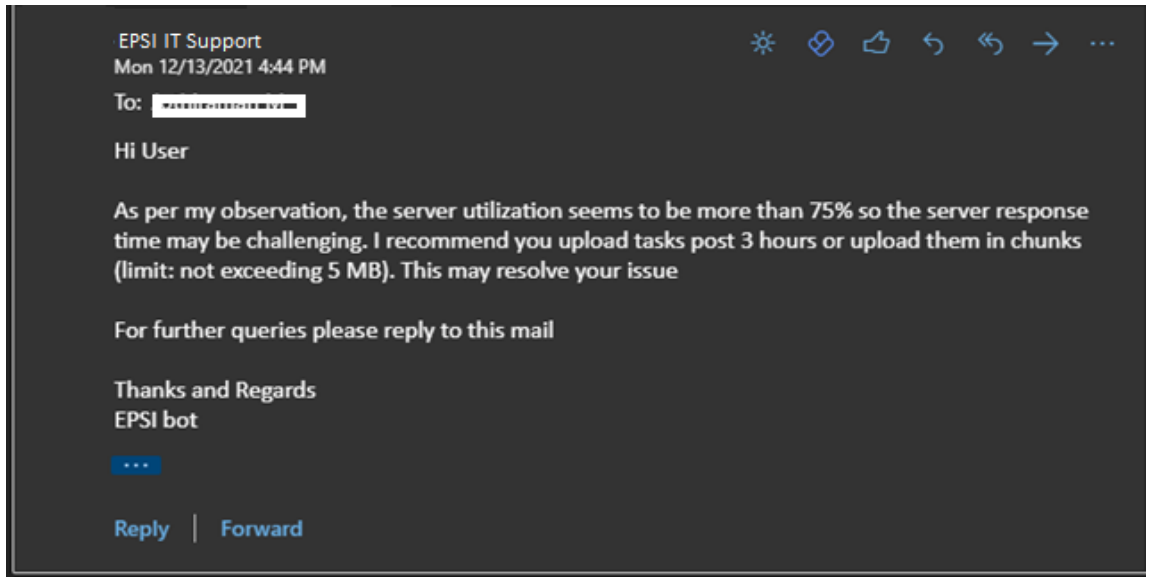



embee
Making IT Easier
Ticket Management System
Dashboard
Ticket Data
Admin
8
Pending
2
Closed
Ticket No
Raised on
Raised by
Issue Type
Status
View
Tick-0001
18-Aug-2021 13:36
ESPL SPO Admin
Desktop Issue
Pending
Tick-0002
24-Aug-2021 11:03
ESPL SPO Admin
Internet Issue
Pending
Tick-0003
24-Aug-2021 14:18
ESPL SPO Admin
Laptop equipment Issue
Pending
Tick-0004
01-Sep-2021 11:46
ESPL SPO Admin
Laptop equipment Issue
Pending
Tick-0005
03-Sep-2021 15:52
ESPL SPO Admin
Desktop Issue
Pending
Tick-0006
23-Sep-2021 15:54
ESPL SPO Admin
Desktop Issue
Pending
Tick-0007
29-Oct-2021 13:00
ESPL SPO Admin
Desktop Issue
Closed
Tick-0008
29-Oct-2021 13:01
ESPL SPO Admin
Laptop equipment Issue
Closed
Tick-0009
29-Oct-2021 15:35
ESPL SPO Admin
Laptop equipment Issue
Pending

Ticket Request mail



Ticket Resolved mail



Json Extracted data using Key phrase extractor


```
{
    "documents": [
        {
            "redactedText": "Hi\n\n
            "extracted issue": My server uploading is getting slow and performance is quite bad\n
            "addon":which sometimes leads to lot of iterations\nKindly look into this immediately\n\nThanks & Regards
            "id": "id__11263",
            "entities": [],
            "warnings": []
        }
    ],
    "errors": [],
    "modelVersion": "2021-01-15"
}
```


Algorithm type: Supervised ML
Time elapsed : 18 mins

Azure ML

Precision – 93.2%	**Score - 91.05 %**
Recall – 89%	**Accuracy – 95.7%**

EPSI

Nothing but the best

embee® Making IT Easier

Leveraging the Power of Actionable Insight of Power BI

01 Azure overview

02 Azure Advisor

03 Security Alerts

04 Compute Details

05 Networking Details

Microsoft Azure Estimate -BOM

Service type	Custom name	Region	Description
Virtual Machines	ADC Server	Central India	1 B2MS (2 vCPUs, 8 GB RAM) (1 year reserved), Windows (License included), OS Only; 1 managed disk – S10(128 GB), 100 transaction units
Azure Monitor	Azure Monitor	Central India	To monitor the parameters and develop the visualization in Power BI
Virtual Network	File Storage	Central India	File Storage, Transaction Optimised Performance Tier, General Purpose V2, LRS Redundancy, 5000 GB of Data at-rest, 5000 GB Snapshots
Azure Log Analytics Workspace	VPN Gateway	Central India	Basic VPN Gateway, 730 Hours
Azure Monitor	Log Analytics	Central India	15 VMs monitored, 2 GB logs per VM
Prediction	AI Buider	Central India	For performance maintenance of the servers and providing alerts on threshold limit
Machine Learning	ML Studio	Central India	For learning the performance of the machine
PowerApps	PowerApps	Central India	To manage the environment and provide an easy usage to the users
Power BI	PowerBI	Central India	Visualization of the Data

Project Summary

Summary

- To develop artificial intelligence approach for Server Monitoring approach
- To develop intelligent Ticketing app using Machine learning bot
- To enhance the server IT operations and monitoring

Objectives

- Helps to identify event patterns and generate metrics in IT Server
- monitors all generated events and develops predictive mechanism
- to pre-empt and resolve incidents
- leading to quicker resolution of tickets and reduced number of overall tickets.

Expected Outcome

EPSI model outcomes in a demo environment

Status

Demo deployment completed and preparing for the production **Within a month**

Corporate Office
8 A.J.C Bose Road, 2nd Floor
Circular Court
Kolkata 700 017
India

Development Center
Infinity Benchmark
6th Fl, Unit No.: Office 9,
Plot – G1, Block- EP & GP,
Sector – V, Salt Lake,
Kolkata- 700 091
India

New Delhi
507 – 508, 5th Floor
DLF Tower A
Old Mathura Road
Jasola 110 025
New Delhi
India

embee®
Making IT Easier

Enabling organizations to transform their business with technology

Thank You

Connect@embee.co.in

Check out other Embee offices here

Mumbai
701 Advent Atria, 7th Floor
Chincholi Bunder Road
Opp Kingstone Tower
Malad (W)
Mumbai 400 064
India

Bengaluru
Queens Corner Apartments,
Block A, 5th Floor,
Blakundari Circle,
Opposite to ACT Office &
Indian Express Building
Bengaluru 560 001
India

Pune
Pune IT Park
Incubation Centre
Unit Number: C/2/204/11
34, Aundh Road
Bhau Patil Marg
Pune 411 020
India