

WIPRO DAAI-AI

# Cloud Monitoring



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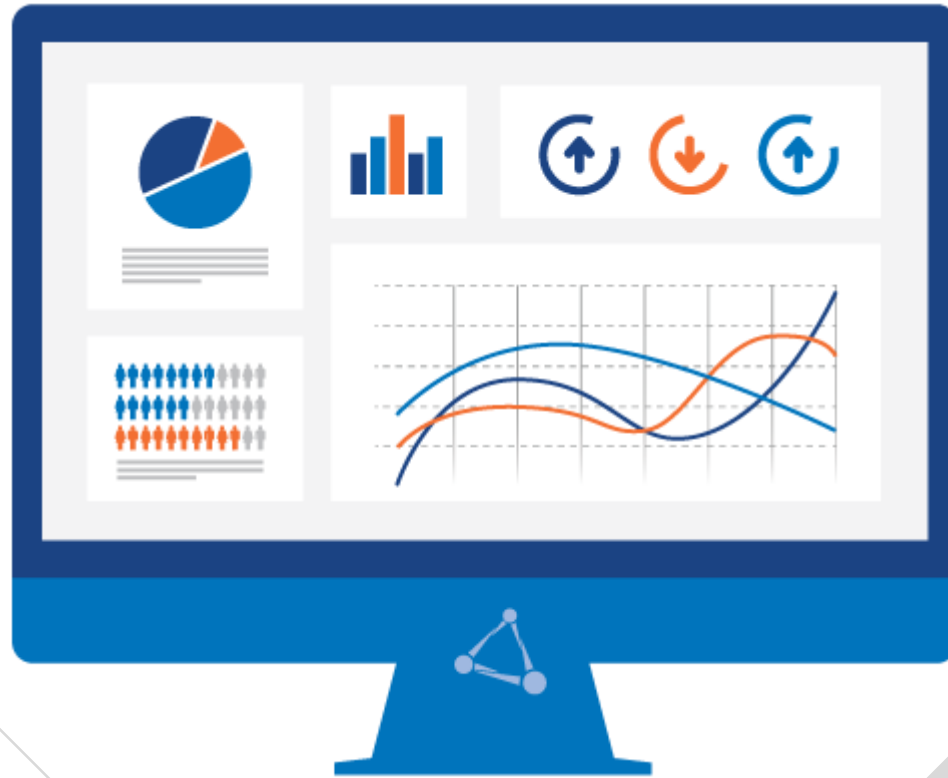


# Problem Statement

- Build a Cloud Monitoring solution architecture that has the following features
  - Dashboards to view usage of AWS resources, jobs and user activity
  - Alerts to notify about irregular usage
- Assumptions :
  - An existing AWS environment with various services and resources configured – which require monitoring
  - A set of business applications and jobs are deployed to this AWS environment that generates logs and require log analytics and monitoring
  - A set of users authorized to use the above environment but the usage and activity needs to be monitored for abnormal usage
- Guidelines:
  - Align the with ELK (elastic) stack with any custom additions
  - Utilize AWS native services where appropriate – Lambda, Kinesis, etc.
  - Adopt well-architected principles and best practices
  - Optimize for cost, maintainability, operational efficiency, security, while delivering the desired functionality

# Problem Statement: Requirements

## Dashboard & Alerts



1

Resource Utilization  
by users and jobs

2

Anomaly Detection  
based on Machine Learning

3

Too many failed  
login attempts

4

Access during off hours



elastic stack



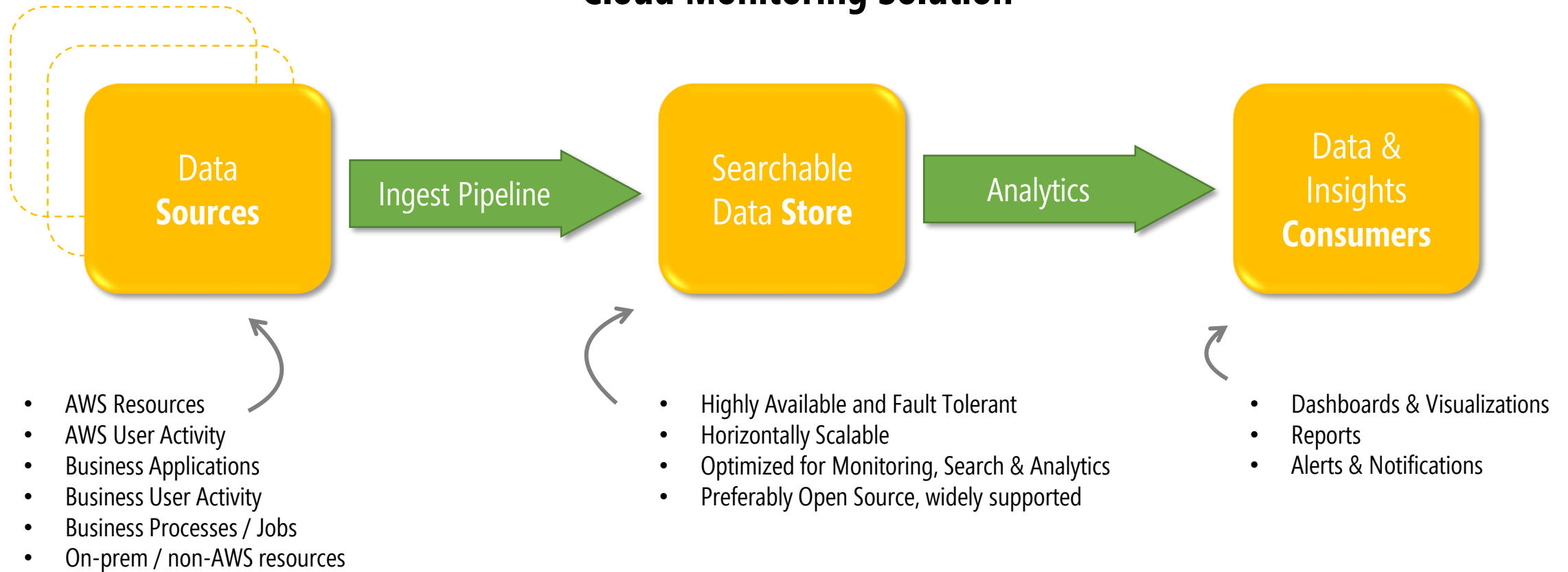
cloud native services

Good to Have:

- AWS CloudFormation Template
- Action Hooks for automatic remediation
- Monitoring of Non-AWS resources

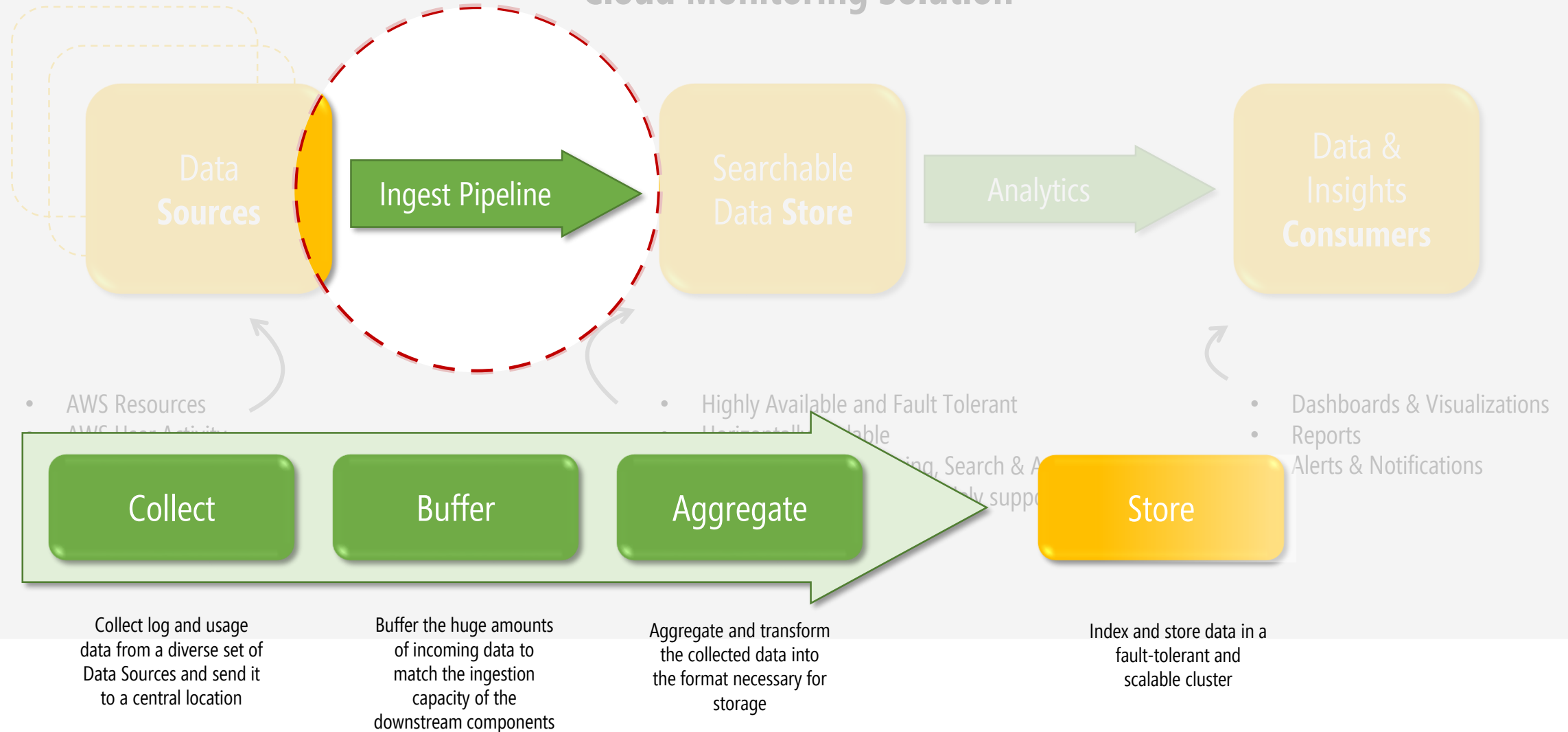
# High-Level Approach : Concept

## Cloud Monitoring Solution



# High-Level Approach : Concept ...

## Cloud Monitoring Solution





# Solution Architecture & Components

## SOURCE

- Business Applications and Jobs running on AWS generating logs.
- AWS Console/CLI Users as well as Application Users and Services generate activity logs and audit trails.

## COLLECT

- Collection of log data is done by a set of agents based on the nature of data.
- CloudWatch Agent runs on AWS resources, collects the logs locally and pushes it to the ingestion pipeline
- Beats (from Elastic) are another lightweight data shippers that are optimized to collect various types of data (log files, metrics, network packets, etc)

## INGEST

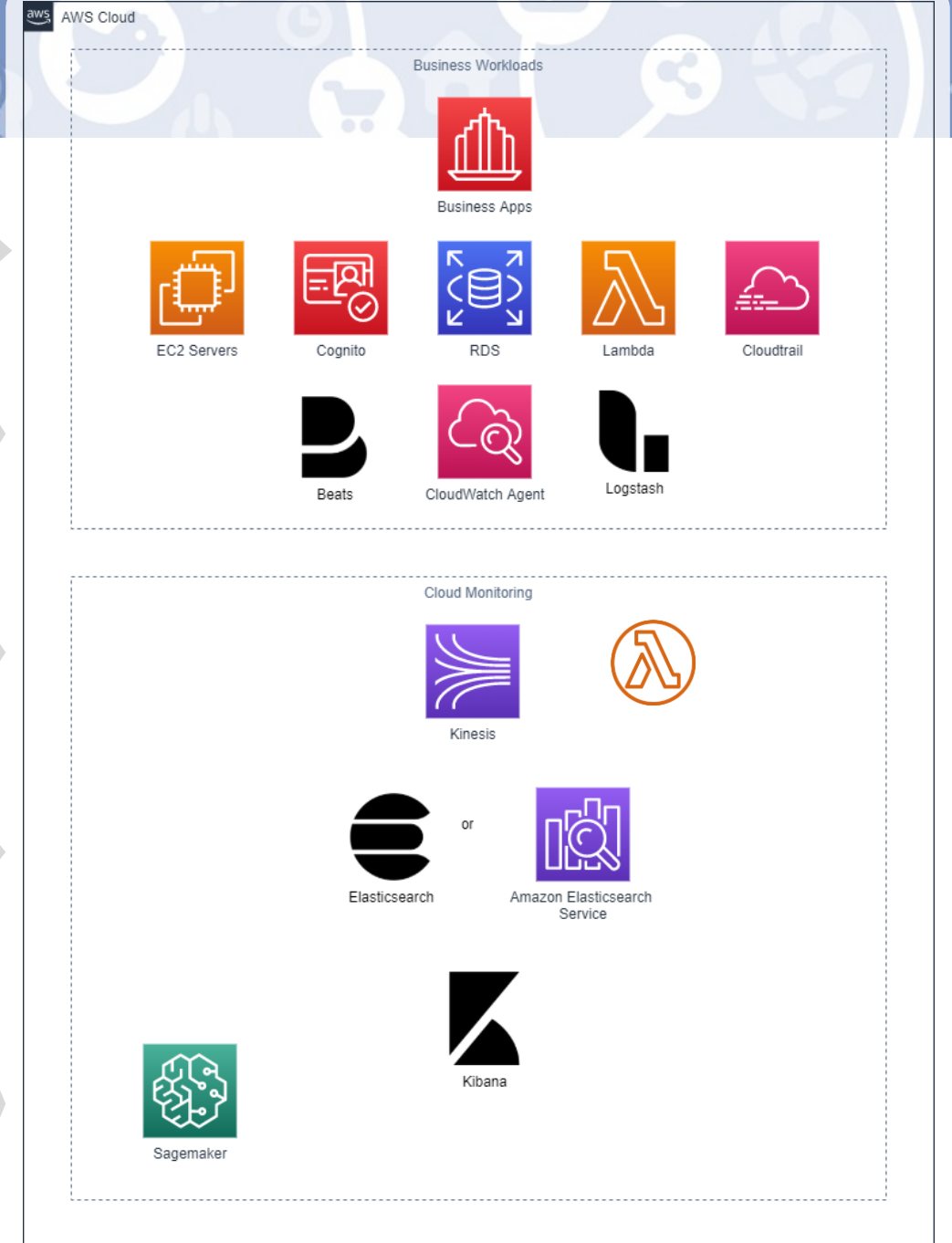
- Logstash can ingest and transform the data for storage in an Elasticsearch database cluster
- Alternatively Kinesis and Lambda can serve as the ingestion pipeline
- Amazon Kinesis service automatically scales to handle the high volume of data ingestion
- Lambda functions can be invoked to transform the data

## STORE

- There are a few alternatives to implement Elasticsearch :
- Install & manage OpenSource distro of Elasticsearch on a cluster of EC2 servers that we monitor and manage, OR
- Leverage the AWS-managed Amazon Elastisearch service with built-in Kibana

## VISUALIZE

- Kibana is the open source data visualization tool from Elastic that will be used to monitor the metrics
- If running on self-managed EC2, Kibana will need to be installed and maintained by us
- X-Pack is a set of add-ons for Elastic stack that enhance the capability including ML based anomaly detection
- Though X-Pack is open-source, it is currently not supported on AWS because of the licensing terms
- Alternatively, Amazon SageMaker service can be used to build and train an ML model to detect anomalies in key metrics



# Raghuveer Varahagiri



**MBA, PMP®, PMI-ACP®, AWS Certified Solutions Architect Professional**

## Qualifications

- B.E. (Andhra University Gold Medalist)
- M.B.A. (IIT Delhi)
- PMI - Project Management Professional (PMP)
- PMI - Agile Certified Practitioner (PMI-ACP)
- AWS certified Solutions Architect – Professional
- AWS certified Developer & SysOps Administrator – Associate
- Google Cloud Certified – Professional Cloud Architect
- ServiceNow Certified System Administrator; ITIL V3 Certified
- Wipro certified in Project Management, Lean, Scrum, and Delivery Manager Readiness Program

## Accomplishments & Accolades

- Wipro-wide AWS Machine Learning challenge 2018 – First Place
- Wipro-wide AWS DevOps challenge 2019 – Second Place
- Inspiring Performance [Customer Centricity] Award 2019
- Delivery Excellence Award for Consumer BU Project Managers in 2013 & 2014 for Ensuring Process Compliance

## Experience

- Nearly 15 years of experience in IT covering Project & Program Management, and Business Analyst roles
- Broad understanding of the technology industry and customer businesses, and ability to provide solutions connecting both
- Customer-site experience of 7+ years at multiple large customers, engaging with senior leadership; delivered presentations to VP & CxO level client stakeholders
- Experience in multiple large accounts The Coca-Cola Company, Hanesbrands, Novartis Pharmaceuticals, Citibank, Target, Nestle, Tapestry (Coach)
- Managed teams of up to 55 people in Managed Services delivery, Managed Application Development & Maintenance projects across multiple technologies and delivery models
- Experience driving lean projects and delivering in agile models with great results
- Knowledge of Wipro tools and processes both in offshore delivery and onsite customer-facing roles
- Knowledge of emerging technologies including Cloud, Machine Learning & AI, DevOps CI/CD, and Automation