

## Capgemini Hackathon Team

















### Service Excellence Predixified – Power Sector

### **Power Sector**



### **Gas Turbines**

Currently most of the aircrafts and ships use GT engines

Used for power generation

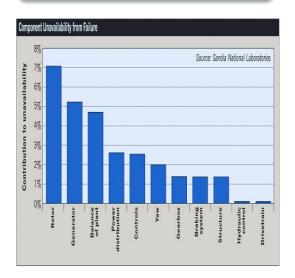
Manufacturers: General Electric, Pratt &Whitney, SNECMA, Rolls Royce, Honeywell, Siemens – Westinghouse, Alstom



### **Gas Turbine Market**

- Present market for gas turbine system equipment and parts is \$40billon.
- The market will grow faster than GDP over the next 10 years
- Demand for cost effective solution for Non regulated turbines

### **Machine Failures**



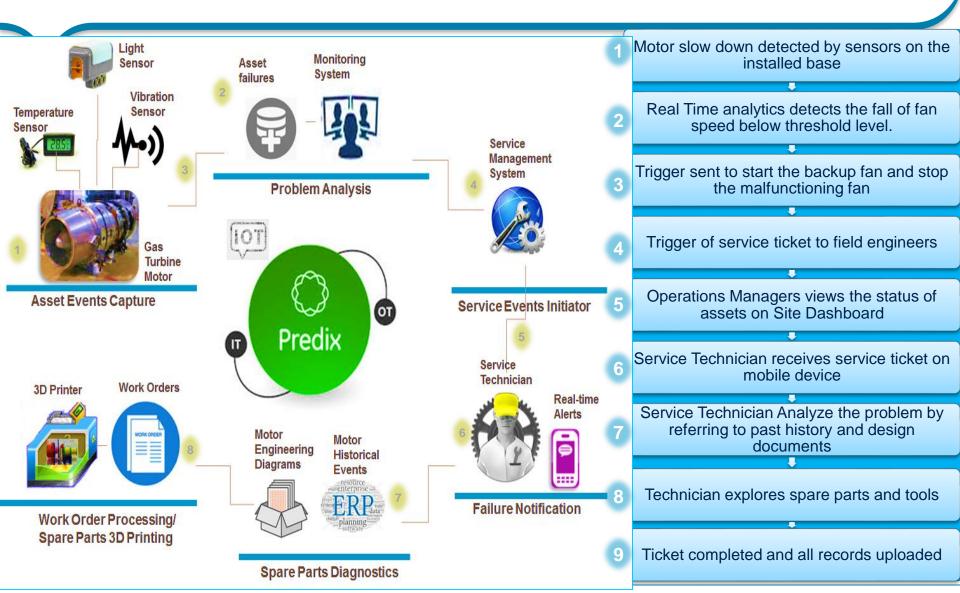
### 2017 Gas Turbine Market \$ billions

	Turbine/gen	HRSG	Steam turbine /gen	Balance of plant	Total
New plants	15	6.3	4.5	3	28.8
Replacement parts and consumables	6	2,5	1.8	1,2	11.5
Total	21	8.8	6.3	4.2	40.3





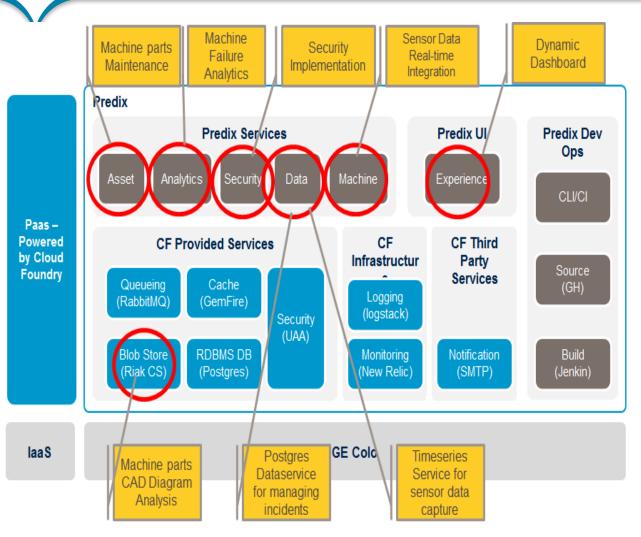
## Proposed Scenario - Predixfied Service Excellence







### Predix<sup>™</sup> 2.0 Services - Applied



#### **Predix Authorization service**

Predix UAA services

#### **Predix Machine services**

OSGI Bundle for data extraction

#### **Time series Services**

Sensor time series data management

#### **Asset Services**

- Manage Machine parts
- Documents references

### **Postgres Services**

Incident failures data management

#### **Blobstore Services**

Machine CAD diagrams storage

### **Analytical services**

Python analytical component for anomaly detection

#### **Predix View services**

- Dynamic Dashboard
- Chart visualization

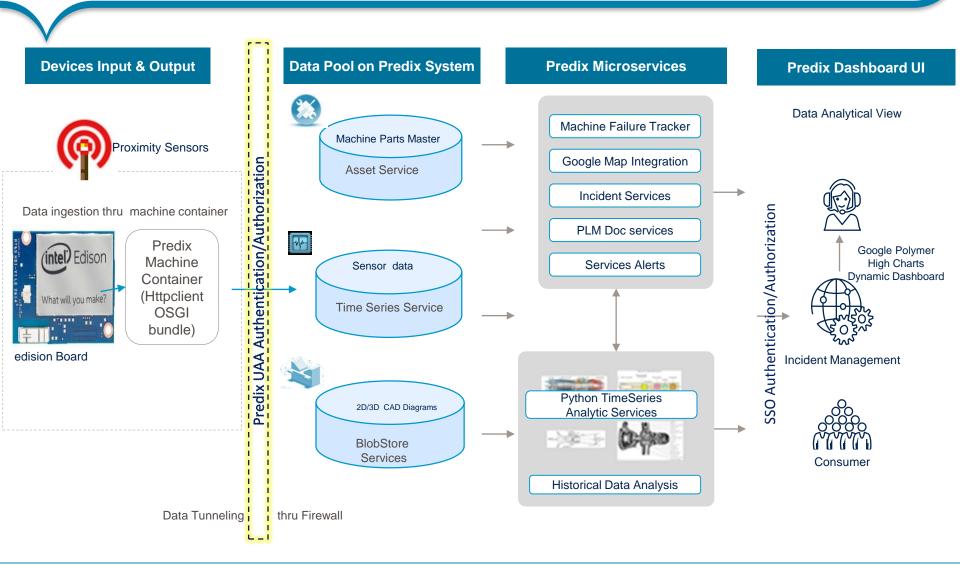
#### **Predix Microservices**

- Access machine parts data
- Failure incidents data access
- Access CAD diagrams





### Solution Architecture







## Proposed Scenario - Predixfied Service Excellence

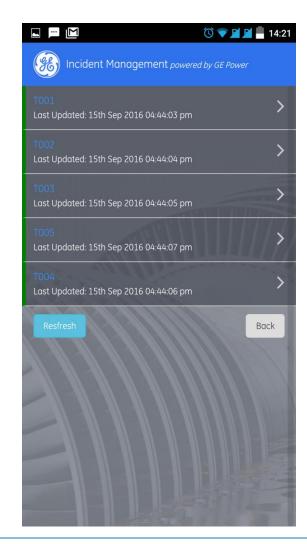






## Proposed Scenario - Incident Management











## Predixified Solution – Key Highlights

### **ZERO** Downtime

Continuous monitoring achievement by establishing digital Twin of machineries on cloud

### Real time response

Invocation of real-time preventive maintenance ensuring continuous asset operation

### **Build context**

Publication of Time series data from sensors for building context around digital Twin

#### Alerts/Notification

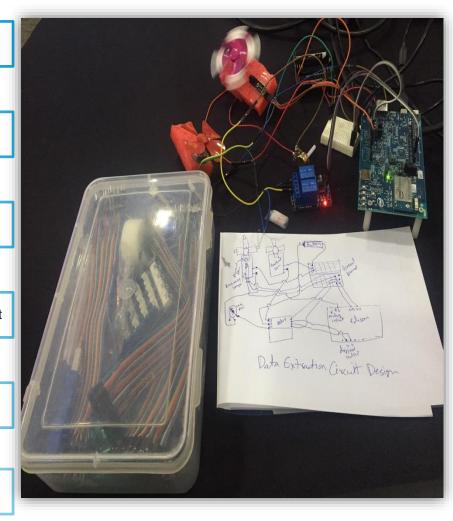
Real-time notification will be sent to field engineers along with service ticket

### Crowd computing

Collaboration with engineering crowd for problem analysis

### Resolution/Recommendation

Technical guidance for issues resolution with right analytical component from Predix Analytical catalog







## Capgemini Accelerators Catalog



### **Visualizations**

- Polymer Component Library Google polimer (Drag and Drop elements)
- ✓ Predix Px-PS charts
- ✓ Paper material for tracking progress
- Angular JS IDE Drag & Drop custom interface for developing UI



### **Security**

- SSO Implementation Guide
- AKANA Implementation Guide for accessing existing databases within GE firewall
- UAA Wrapper component for consumption of UAA
- User Management Implementation Guide
- Security Assessment and Secure Development
   Checklist



### **Testing**

- Q Box Testing suite for Predix Apps (WIP)
- Device Cloud Testing Cloud for testing apps on various devices
- Timeseries Test Data Generator – Test data generation utility for timeseries
- Mock Services Testing utility for Contract testing for restful services



### **Assets -Timeseries**

- ✓ Asset Model Import Utility – Allows to import asset data from csv, excel
- Time series Ingestion component deployed in predix machine container from any sensor



### **Analytics**

- Python Analytics for anomaly detection
- ✓ Proactive Engine
  Maintenance planning utility



### **Migration**

**Assessment and Migration Guide** 

- Reference Apps for demonstrating Legacy
   J2EE and Predix apps to Predix 2.0
- UI Migrator for migrating legacy UI to Predix Ready UI
- Customized Devbox
- Enterprise Search Migration Utilities Enables to migrate from any search to ElasticSearch
- Bulk Load from external database to Postgres





### Future Possible Enhancements

Akana webservices for real-time integration of 2D / 3D engineering diagrams from PLM

Enhance current sample Incident Ticket feature with Service Now Incident Management

Develop Digital Twin to identify faulty component and provide assistance in quick repair

Apply context aware computing techniques for establishing self learning Digital Thread

Integrate with Wearable Device to fetch component information through PLM in realtime

Local 3D printing for faster part replacement

Forecasting failure based on historical data and other parameters





# Thank You

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