



*To provide insight for enhancing wealth*

Since 1985



**CMMIDEV / 3**<sup>SM</sup>  
CMMI®V2.0 / Exp. 20 23-0 1-29 / Appraisal # 5 10 62





## Quality Policy

*"We shall provide information technology products/services that exceed customer expectations in their **functionality, usability, reliability, performance, adaptability and supportability** to achieve market leadership and continual improvement of business performance"*



## Vision

*"To provide **insight for enhancing wealth**"*  
*INSIGHT - refers to TRUTH. Our Vision is to develop Products & Solutions to the Customers which provide **truthful information** that can optimize & improve the Business Process.*



## Mission

*To provide **freedom of creativity/innovation** in exploiting the potential of information technology.*



**30+ years**  
Product Expertise



**130+ Service Centers**  
Across India



**100+ Innovative**  
Smart Solutions



**300+ Skilled**  
Service Engineers



**Domain Expertise**



**100+ R&D**  
Engineers

**Head Quartered in Mangalagiri, Andhra Pradesh**



**Technology  
Partnerships**



# Building End-End Smart IoT Solutions

Embedded Systems & Application Software

**800+ People**



Conceive

Concept



Develop

Analysis  
Design  
S/W & H/W Implementation  
Integration  
Testing



Manufacture

Assembling  
Quality Testing



Implement

Installation  
configuration

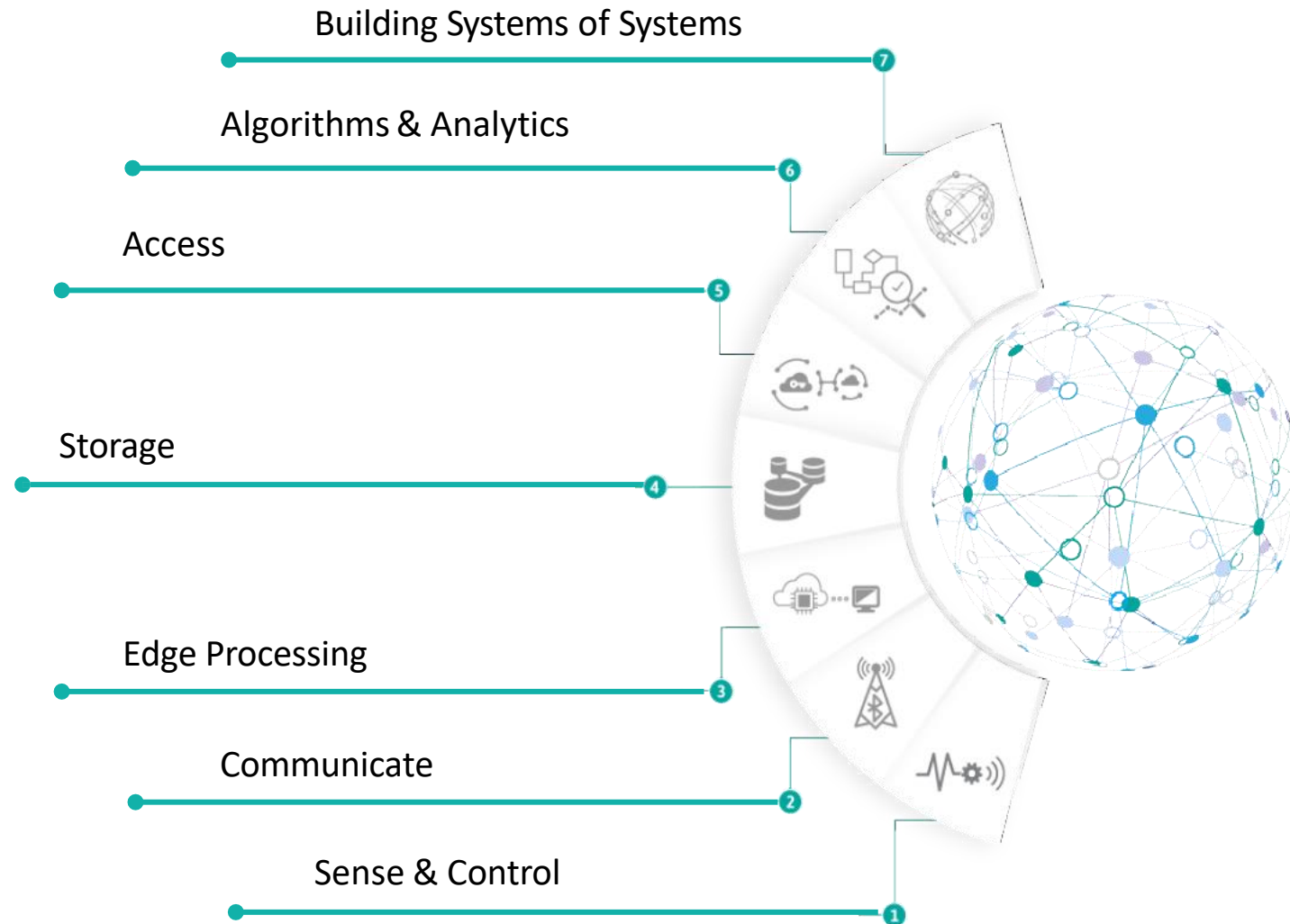


Support

Commissioning  
Maintaining

# DESIGN CAPABILITIES

Proven Expertise In Building end-to-end IoT Solutions



# Design Capabilities

Embedded systems  
(with various IOs /  
sensors capabilities)

Multiple/Redundant  
servers, Clients

Sensor Networks

Control Networks

## Hardware

- Programming Languages
- Sensors
- Communication
- Tools

## Software

- DESKTOP APPLICATION
- Mobile Apps
- Web Application
- Database
- IDE
- Analytic Tools
- Platforms
- Servers
- Frameworks
- REST API's
- Cloud

# MANUFACTURING



**1,50,000 SQFT**  
facility for various  
activities

**0.25 Million+**  
Solder points / Day

**2 SMT** Production  
Lines with Pick and  
Place Machines and  
Reflow Machines

Sourcing **50 Million+**  
qty. of Items from  
**500+ Vendors**

**Automation of**  
Routine activities  
through IT

**Real time** monitoring  
of Production at **CCC**

**Chain Process** to  
optimize time, cost and  
improve quality

**Automated** Testers  
assuring quality

**Just in time (JIT)**  
Supply Chain

**Quality  
inspections** in all  
stages from Inwards to  
finished products

**100%**  
Inspection of all  
finished products

**5K+**  
Finished Products /  
Month

Successful **5S & Lean**  
Manufacturing process

Following standard  
processes like **IPC & J-  
STD**

Temperature and  
Humidity **Controlled**  
Environment

**Pick 2 Light** System -  
to identify store  
material quickly

# Footprint

**15000+**

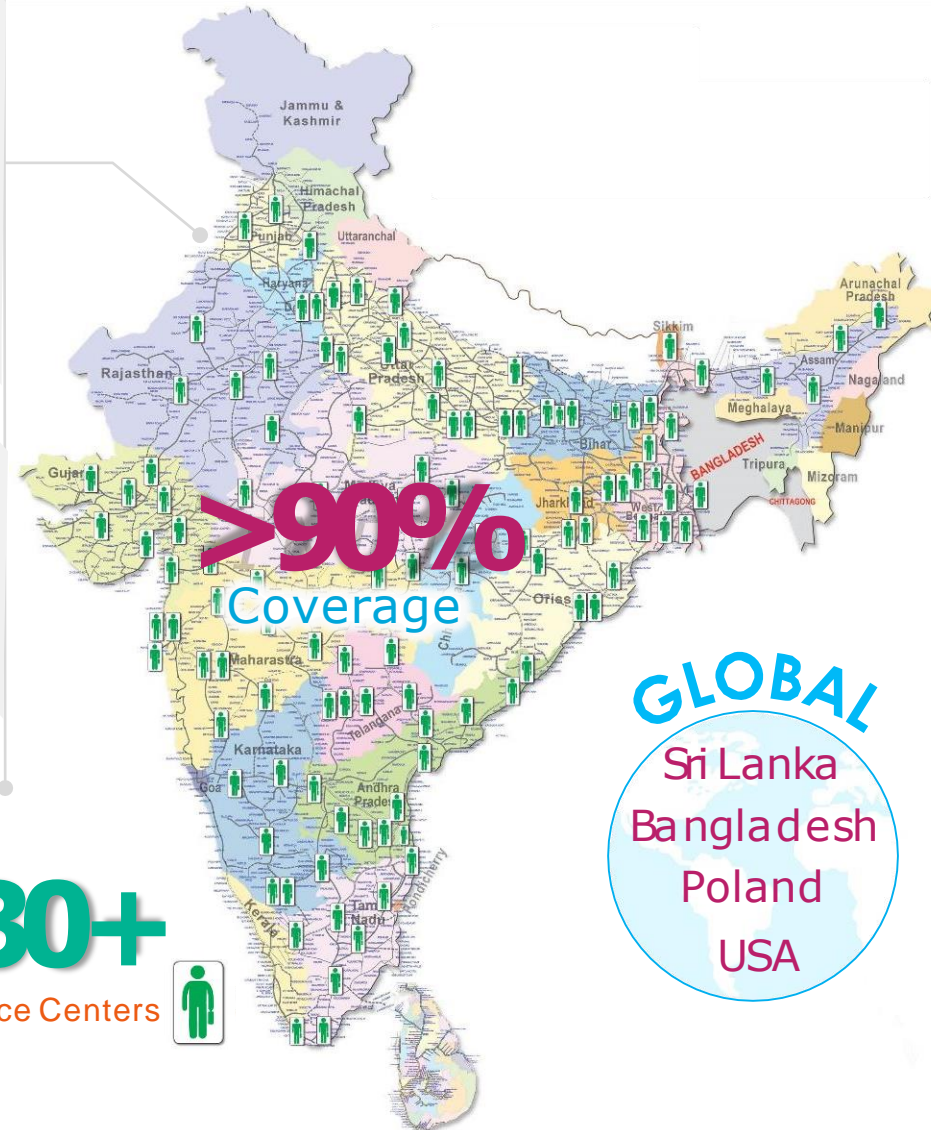
Product deployments

**9000+**

Locations

**130+**

Service Centers



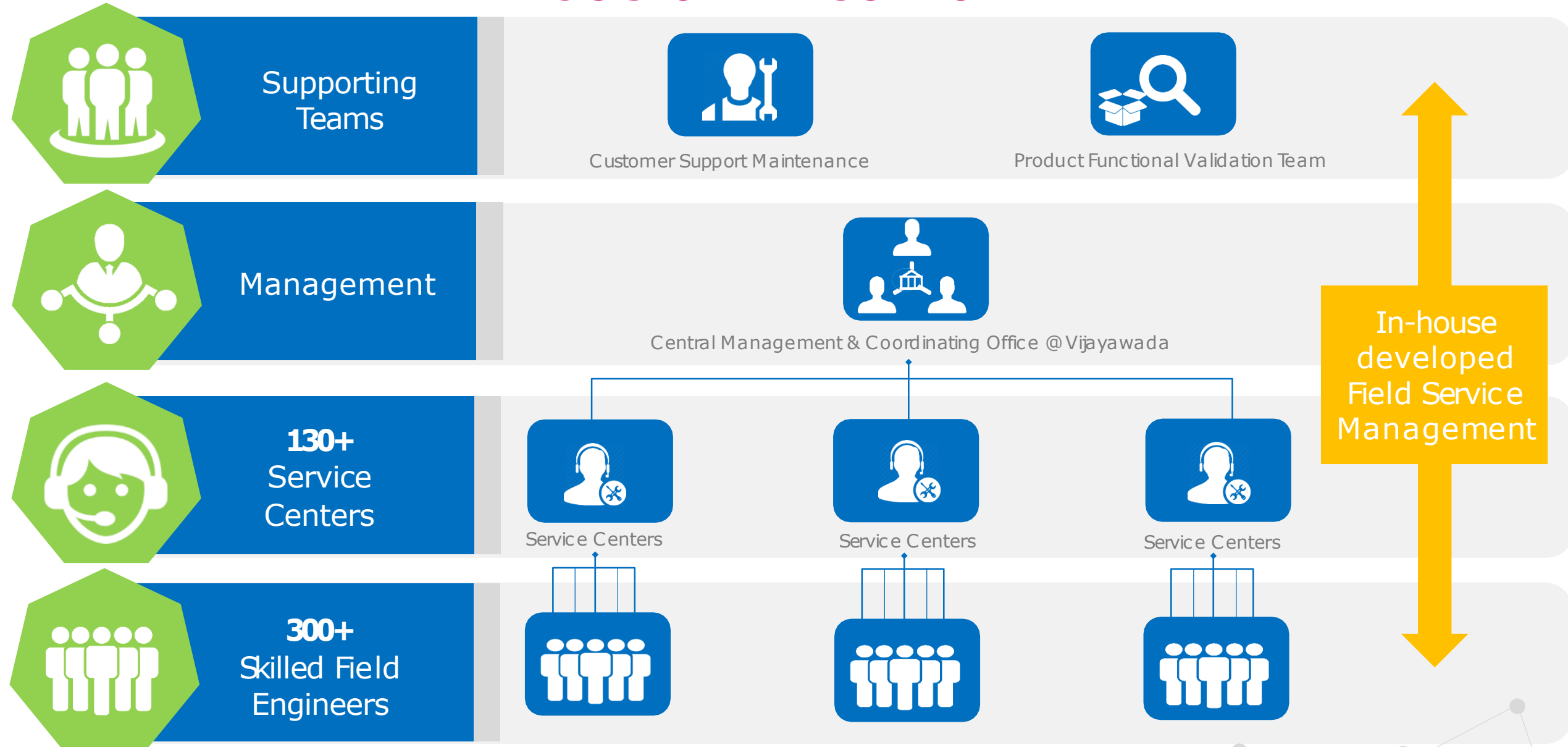
## Deployment in Indian Railways

Data logger	6608
RTU	3319
SPAU	861
PHMU	583
COA	540
BHMU	141
CMU/LRS	408
SSI Protocol converter	1896
FEP	484
Data concentrator	165
Servers	170
SSBPAC(D)	110 (55 pairs)
AWS	134
DAC Interfacing Unit	45

## Deployment in DFC

Data logger	18
RTU	51
Condition Monitoring Equipment for Point, Signals, Battery and others	373

# CUSTOMER SUPPORT



# IT - DRIVING BUSINESS

1

## Enterprise Resource Planning

- Complete Order Tracking
- Financial Management
- Products BOMs & Configuration Management
- Vendor Evaluation
- Just In Time Procurement
- Inventory & Tracking
- Finished Products Tracking
- Integration with Mobility/Mail Alert



3

## Cash Flow

- Control of Inflow and Outflow of Cash
- Visualize Future Incoming and Outgoing of Cash
- Mobile Integration



5

## Time Attendance Management System

## Order Management System

- Auto Integration With ERP
- Optimized Sale Orders
- Execution Planner
- Inventory Projection Tool



2

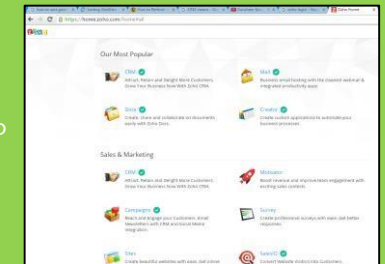
## R&D Project Planner

Task #	Task Name	Duration	Total Units	Done Units	Actual Units	Remaining Labor	Schedule Start	Schedule Finish	Predecessor #s	% Complete	Resource Name
1	Service Management Software	2496d	15863.01	10783.54h	15863.01h	0h	01/28/08	03/28/16		100%	
2144	Service Management Software	353.22d	392.53	88.29h	364.21h	4h	01/30/15	03/28/16		99.45%	
2207	Call Register Reports	13d	55	0h	55h	0h	01/21/16	02/05/16		100%	
2208	Call Log status Report	2d	23	0h	23h	0h	01/21/16	01/22/16		100%	VIJAYA
2209	open/closed Logs Reports	2.5d	6	0h	6h	0h	01/21/16	01/23/16		100%	VIJAYA GOLI
2210	Status Update Reports	1.5d	4	0h	4h	0h	01/21/16	01/22/16		100%	VIJAYA GOLI
2211	MTBR Reports	10d	22	0h	22h	0h	01/22/16	02/05/16		100%	VIJAYA GOLI

4

## Customer Relationship Management

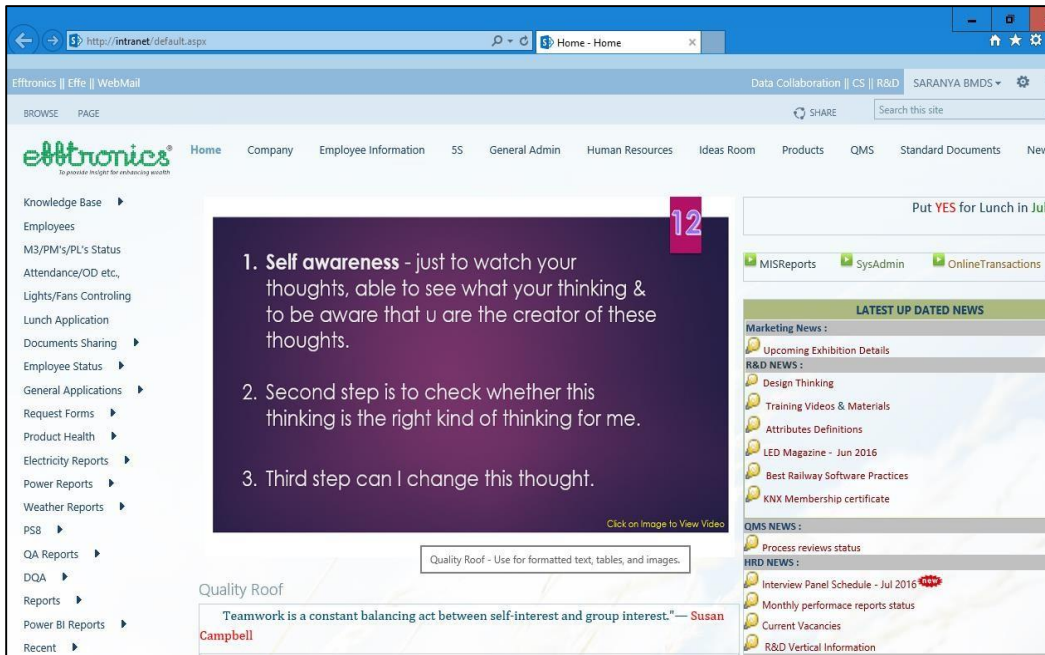
- Leads to Quotation
- Integration
- Integration with ERP
- Mobile and Web Platform
- Analytics



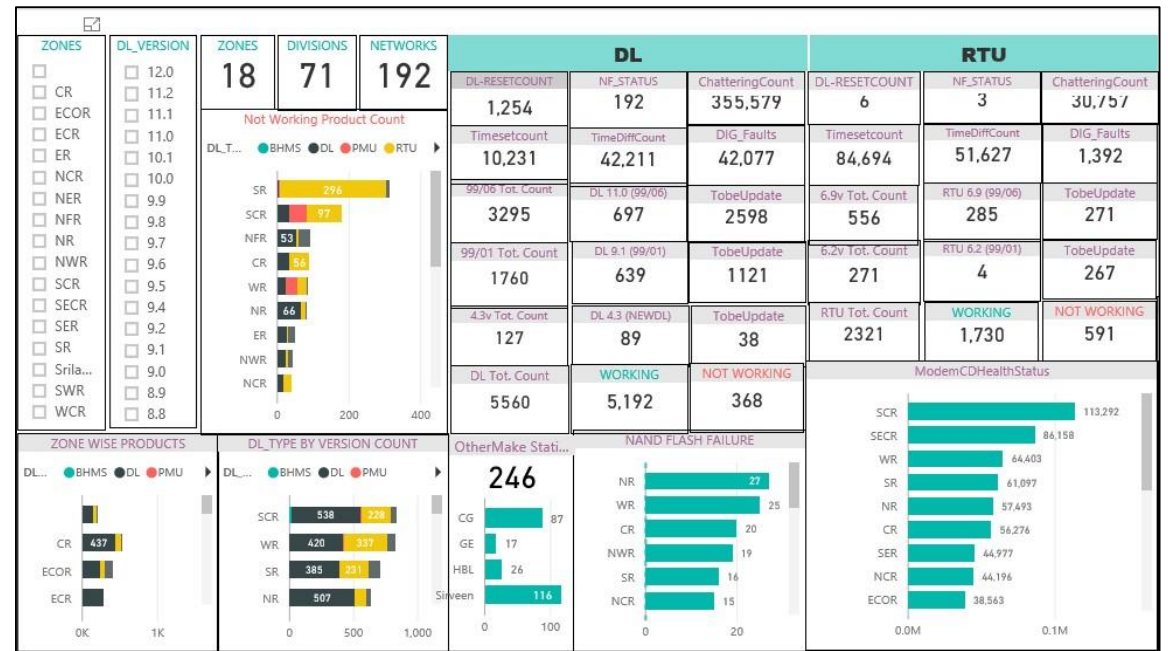
6

# DATA DRIVEN DECISIONS

## Collaboration – Share Point



# Data Analytics - Power BI



# Human Resources & Academic Relations

(RIGHT PEOPLE FOR RIGHT JOB)

**MOUs** with **15+** Engineering and science colleges for faculty and student development programs

**Continuous learning** program for **employees** in management and **futuristic technologies**

Active member in **Board of Studies of Universities** in developing academic curriculum

Running **M. Tech (IoT)** Course for JNTU Anantapur

**Collaboration** with AP Skill Development Centre & MSME

Connect with more than **300+** academic institutions for **hiring**

**Activity based** learning modules

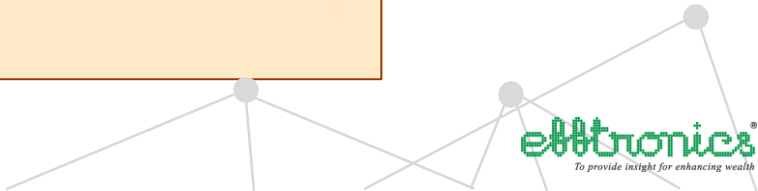
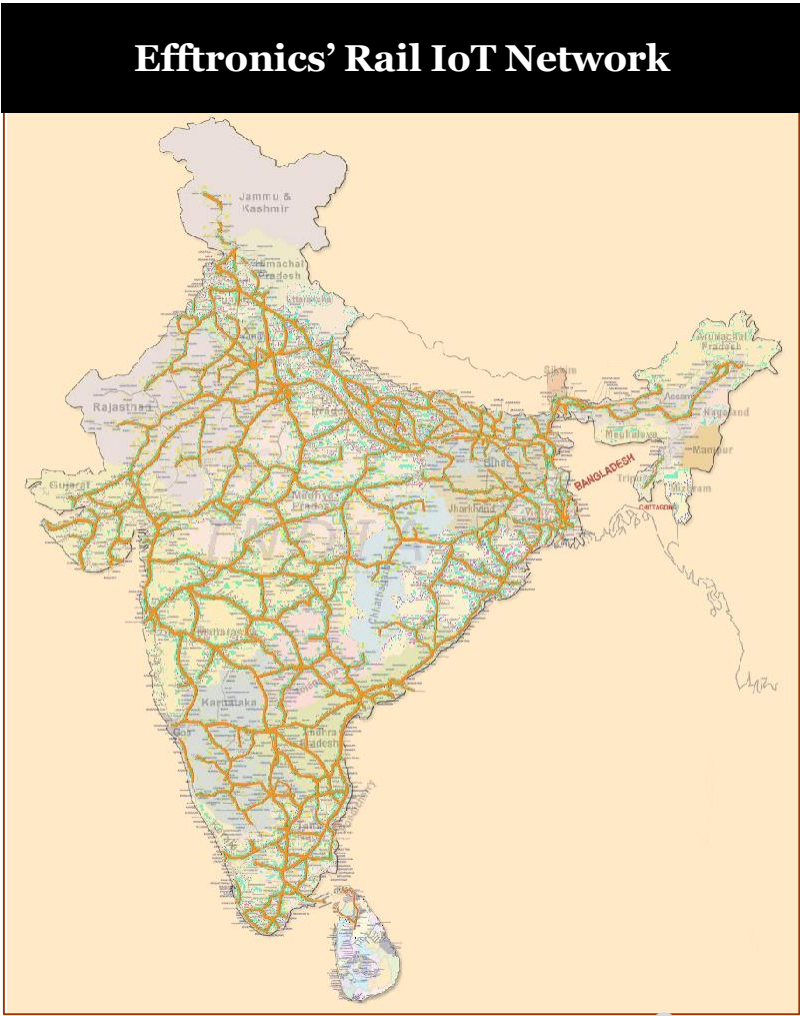
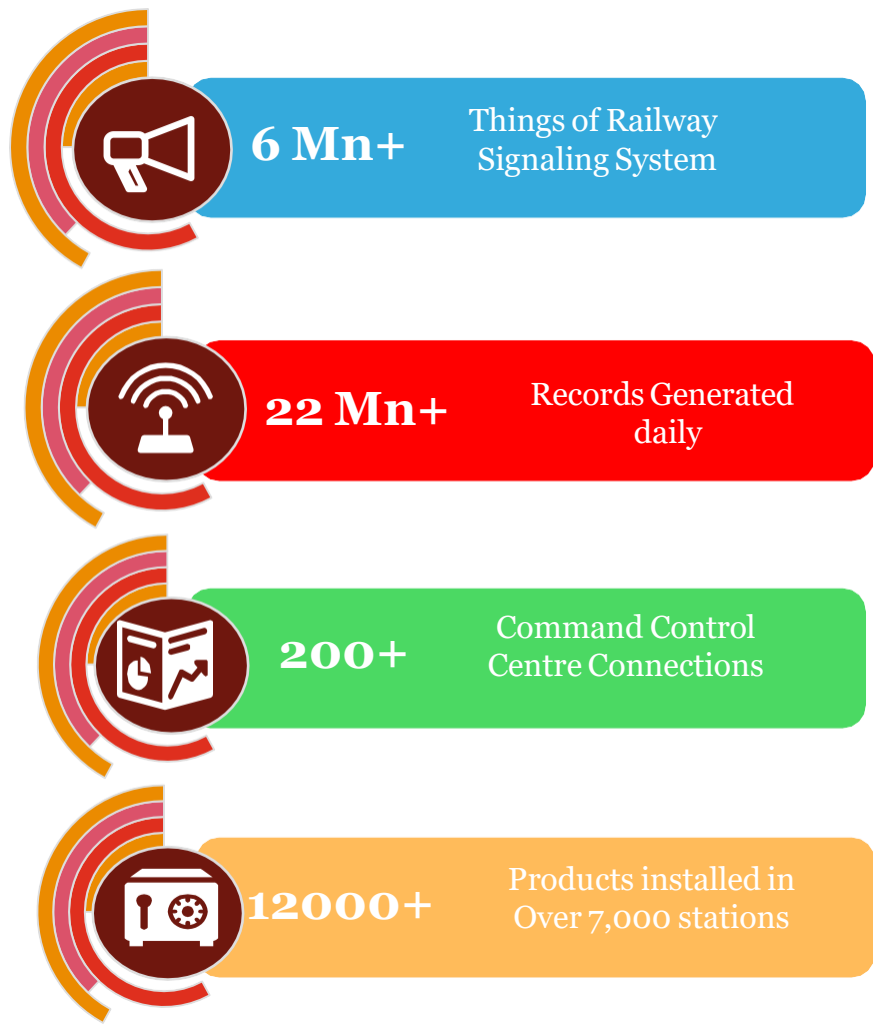


# YOUR ONE-STOP DESTINATION FOR END-TO-END SMARTSOLUTIONS



for 24/7 operation  
under Harsh Indian Environment Conditions

# Efftronics has designed, built and deployed one of India's Largest IoT Network for the Indian Railways...



# Our Solutions

10k+  
Data Loggers  
& RTUs

## IoT Edge System

- Works as a black box for Railway Yard for signalling System
- Capture all relay status and analogue parameters in the relay room.

950+  
Pont Machine  
Monitoring

## Predictive Maintenance System

- Predicts the failures much ahead by real time analysis of point machine voltages and currents
- Improves MTTR and MTBF of system

40+  
Integrated  
Power Supply  
Monitoring

## Remote Condition Monitoring

- Provides remote condition monitoring of various power supplies with in railway yard
- Identified faulty module in power distribution and informs the railway personnel

150+  
Battery Health  
Monitoring  
Unit

## Predictive Maintenance System

- Predicts the failures much ahead by real time analysis of battery parameters
- Extends the battery bank life and guarantees backup

110+  
Block  
Instruments

## SIL-4 Certified

- 2o/o3 Architecture
- Complies to European CENELEC standards
- First in INDIA to develop the product and get approval

860+  
Safety Point  
Alarm Units

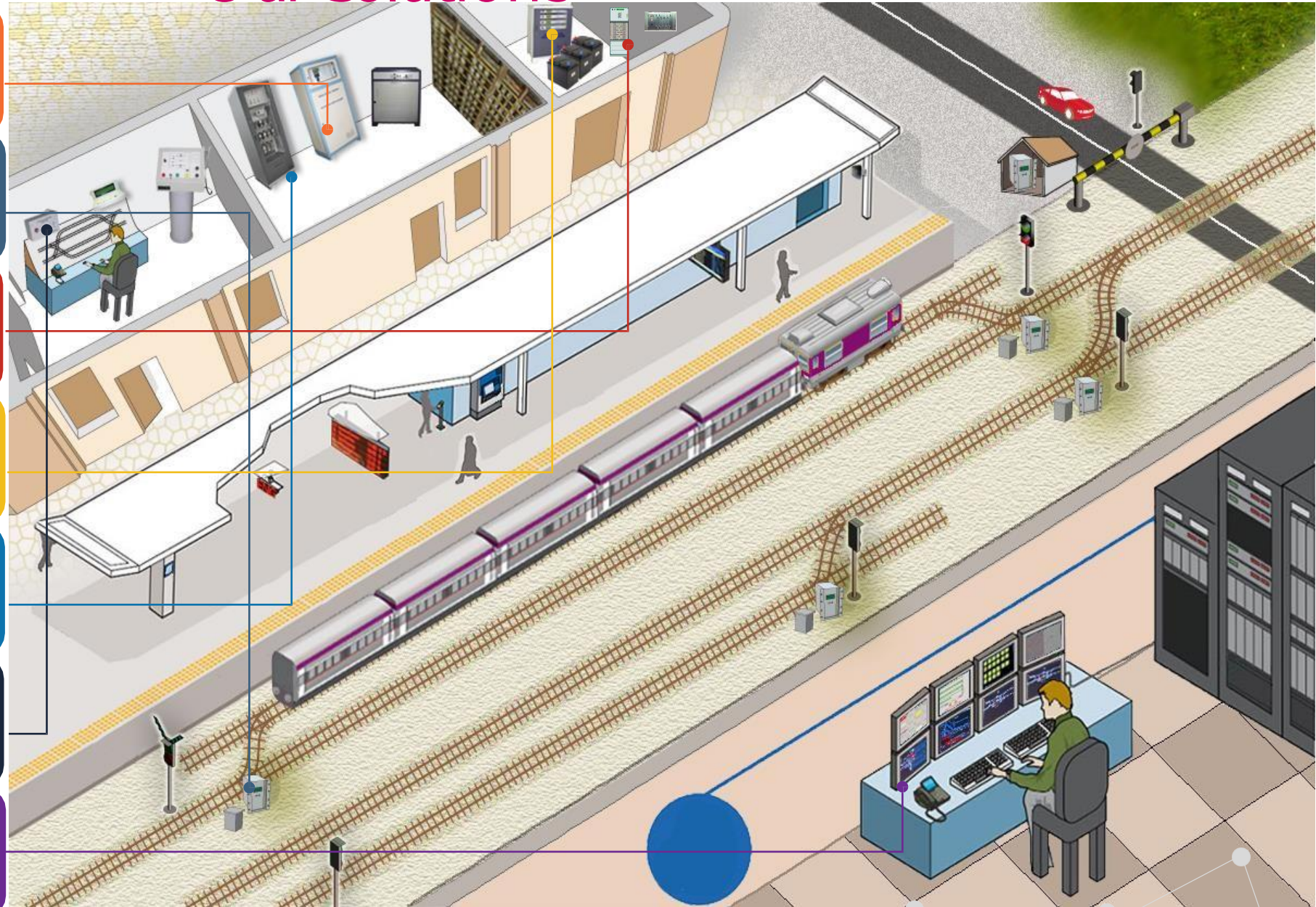
## Prescriptive Solution

- Eliminates accidents at railroad points through prescriptive alert to station master

200+  
Control  
Centers

## S/Ws

- Real-time simulation of yard
- Predictive Maintenance of railway assets
- MIS Reports & Failure Analysis System
- Network Management System



# CUSTOMER CENTRIC APPROACH

Service Engineers & Spares are placed strategically to rectify the problem

## Increase Usability

Training Customers on Efftronics Products for getting value

## Railway Domain

20 years of Domain understanding along with 50 in house engineers with Domain Expertise

## Improving

Data Analysis for improving the correctness of Alerts

## Serving Largest Network

Remote Monitoring and Assistance for 290+ Networks located across 68 Division Head quarters

## Customer Reach

Working with 300+ Signaling contractors & integrators, Connected to all Zonal Railways and all cadres in Indian Railways.



## Asset Performance Management

- Remote Diagnosis
- Remote Condition/Health Monitoring
- Predictive Maintenance

## Operations Optimization

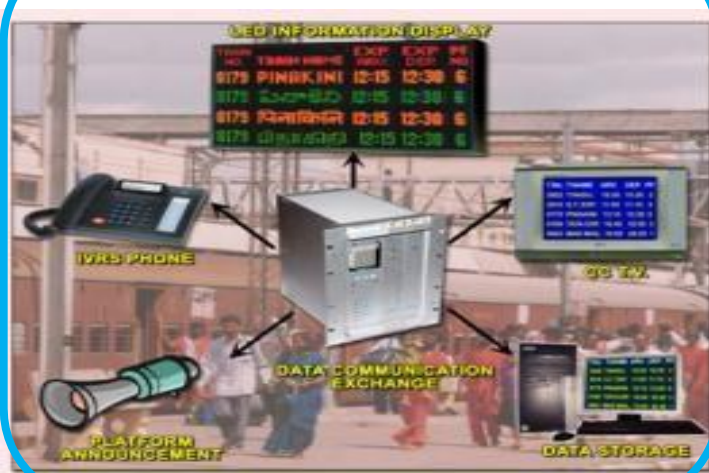
- Modeling and Simulation
- Failure Analysis System
- Data driven decision support system
- Process / Workflow optimization

## Fail Safe Systems & Communication

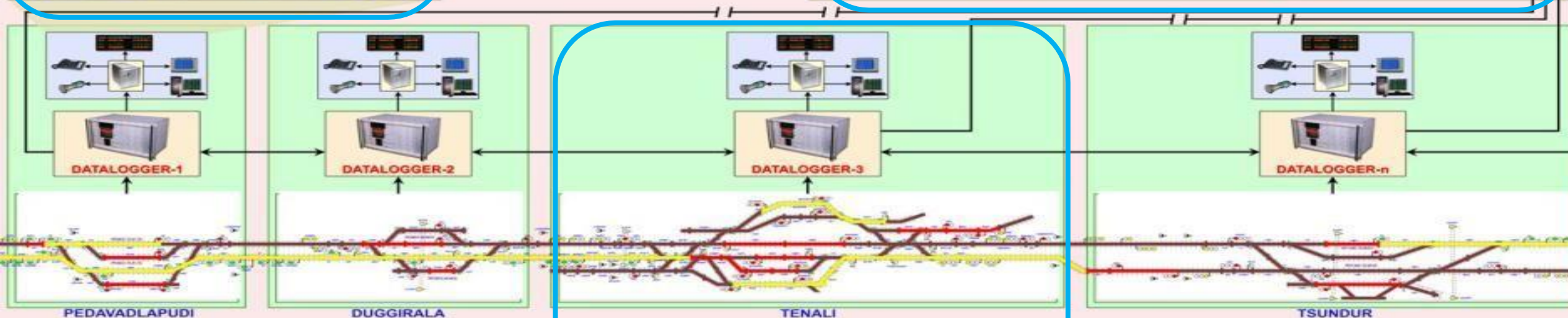
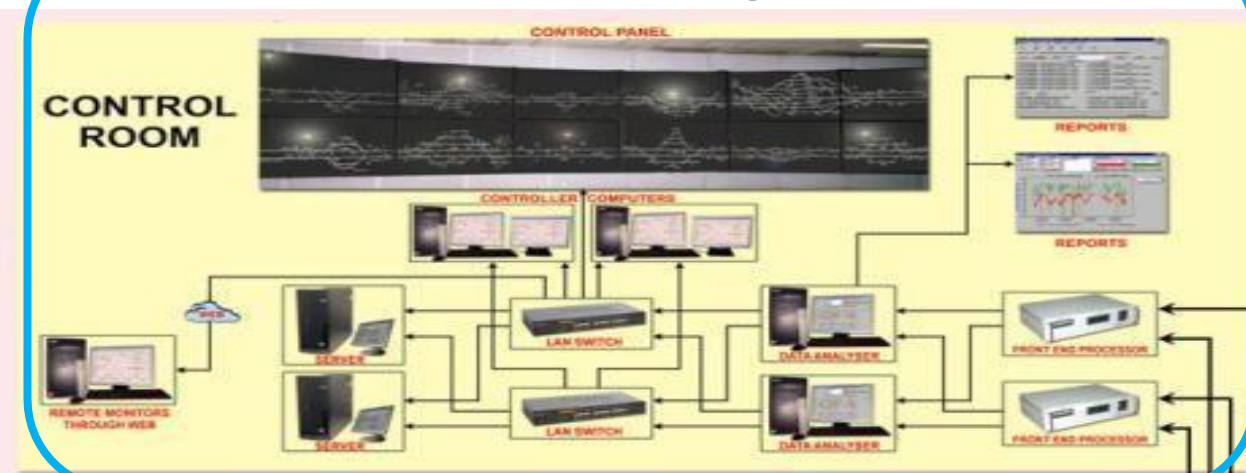
- SIL4 Certified Control System
- SIL4 Certified LED signals
- Interface converters
- Data Aggregation

# Smart Railway Signaling

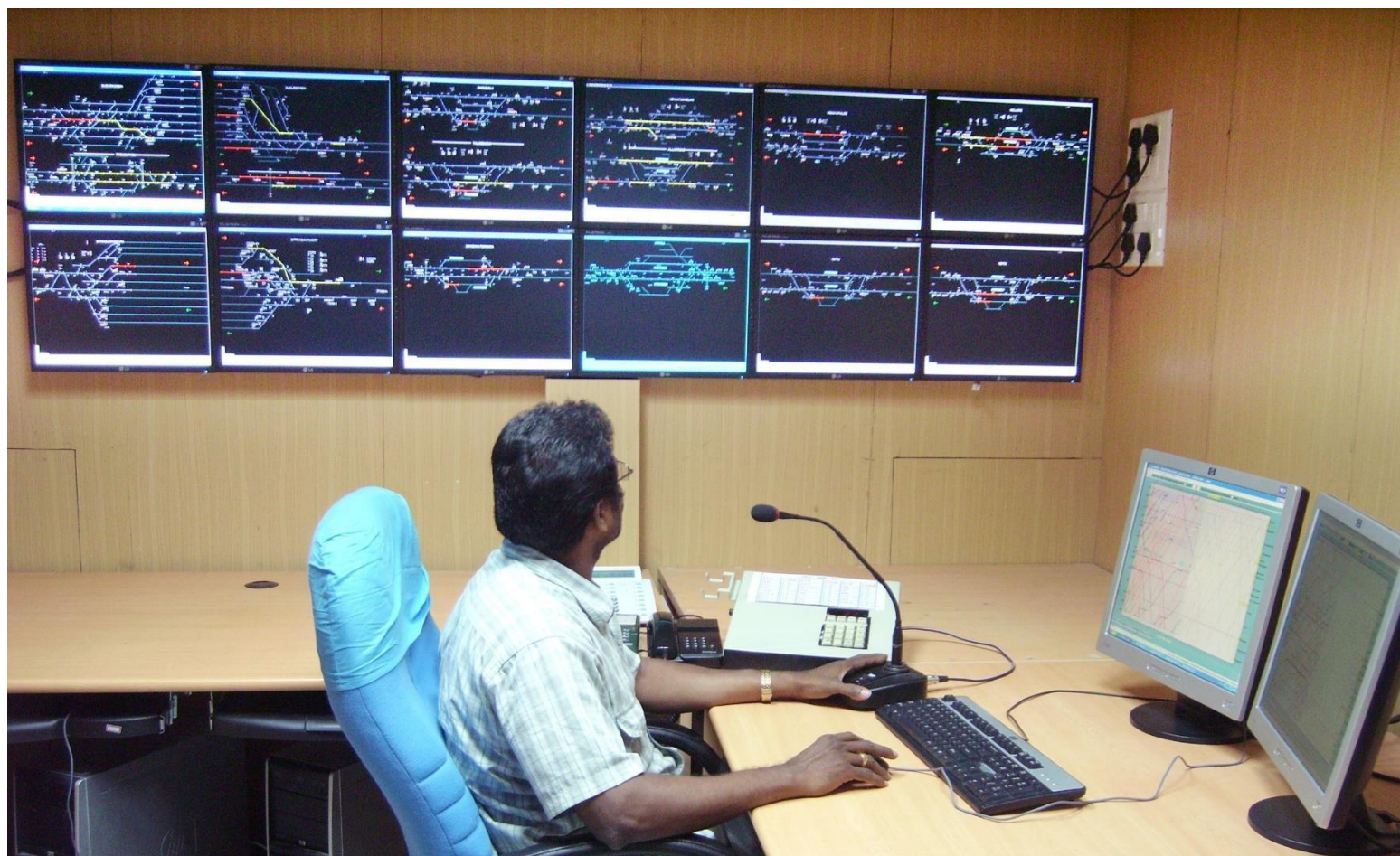
## Data Dissemination



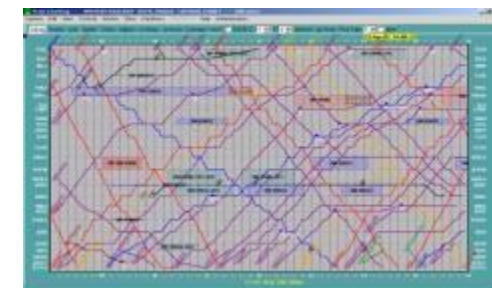
## Data Processing



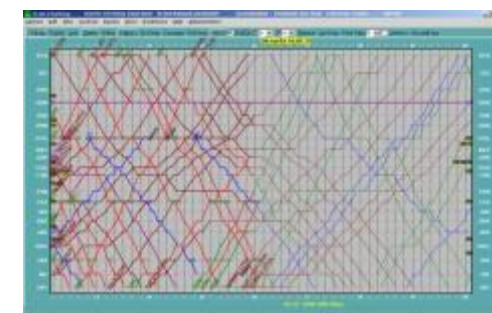
## Data Acquisition



Tracking

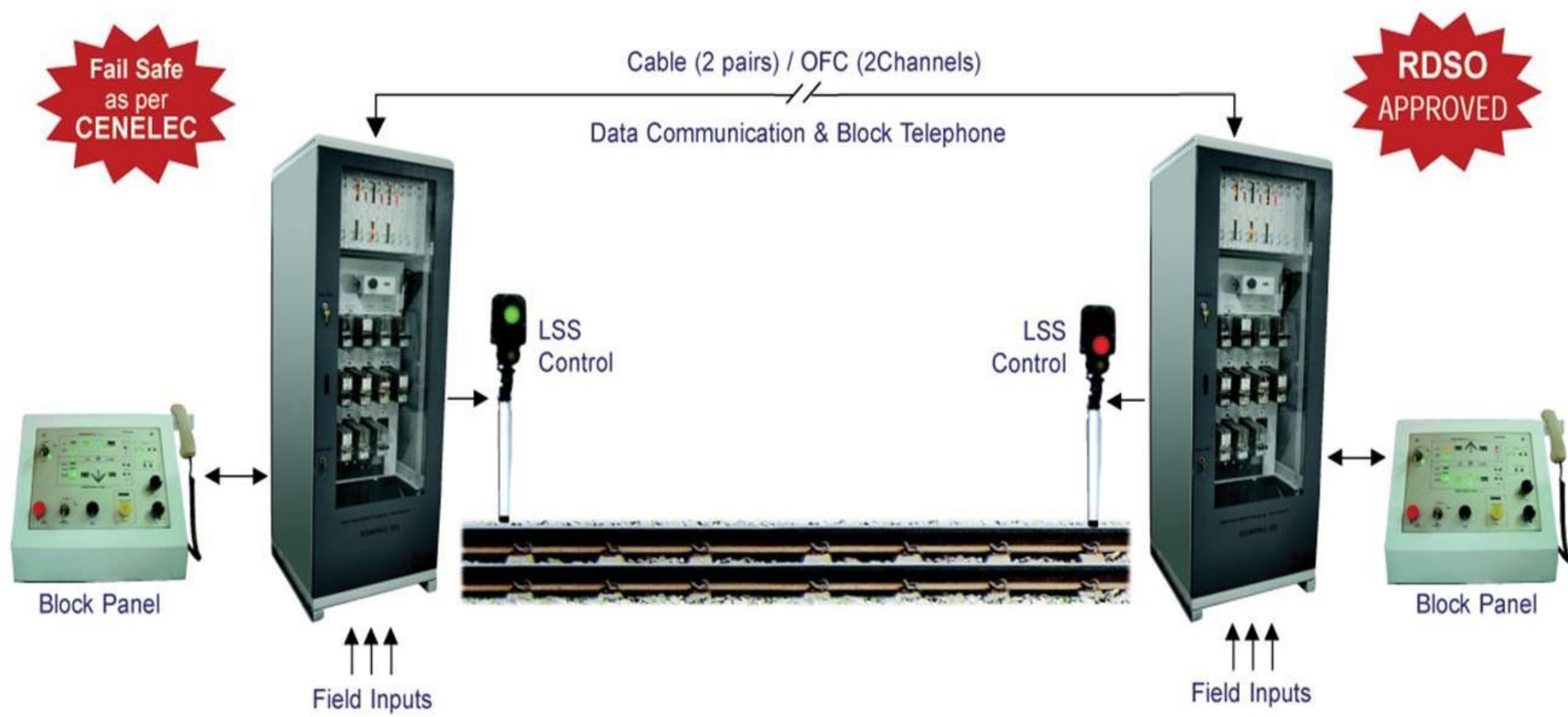


Charting



Prediction

*Multi Monitor Simulation Networked Data loggers in Vijayawada Division Control Office*





# Signals

RDSO Approved



## Main Signals



2-way LED stencil route indicator



4-way LED stencil route indicator



Single digit Route indicator



Double digit Route indicator



A - Markers



Route indicator



Shunt Signals



Calling on

Long Visibility

Energy Saving

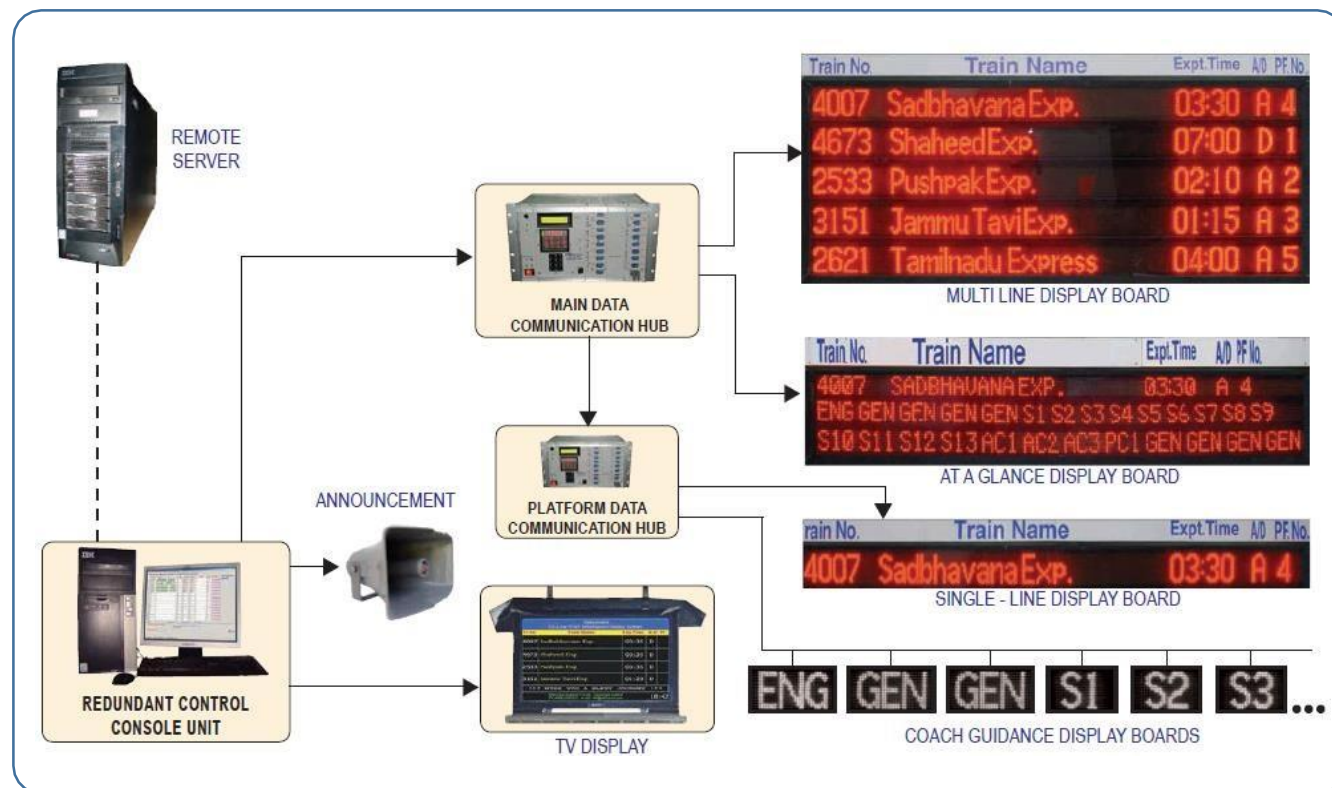
Maintenance Free

SIL-4 Certified

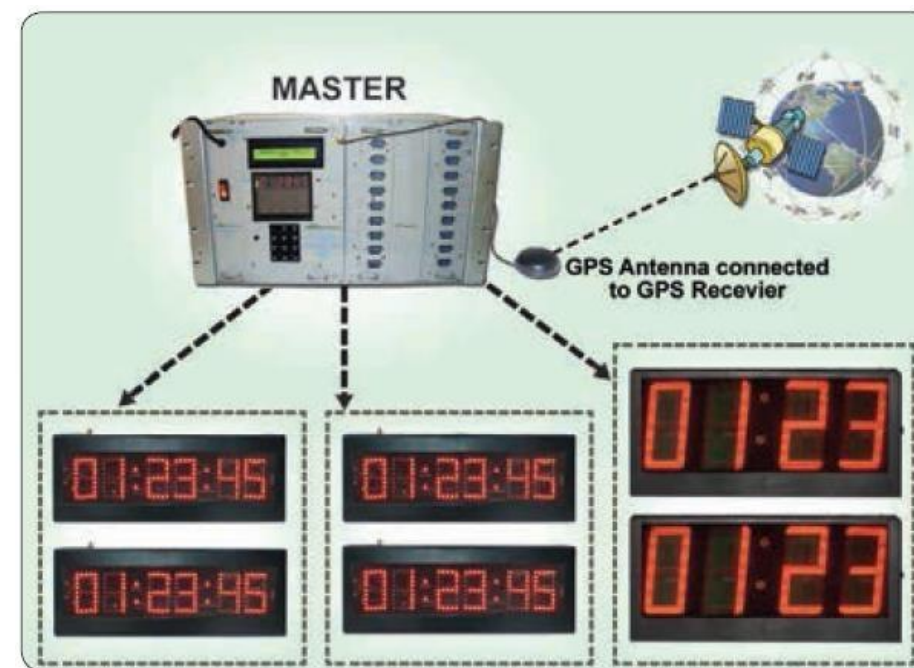
Quality & Reliability



## Integrated Passenger Information System



## Platform Clocks with GPS Synchronization

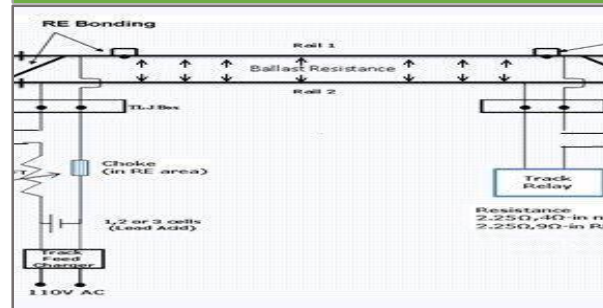




## El Monitoring



## Track Circuit Monitoring



## Point Monitoring



## Battery Bank Monitoring

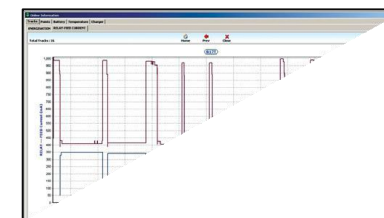
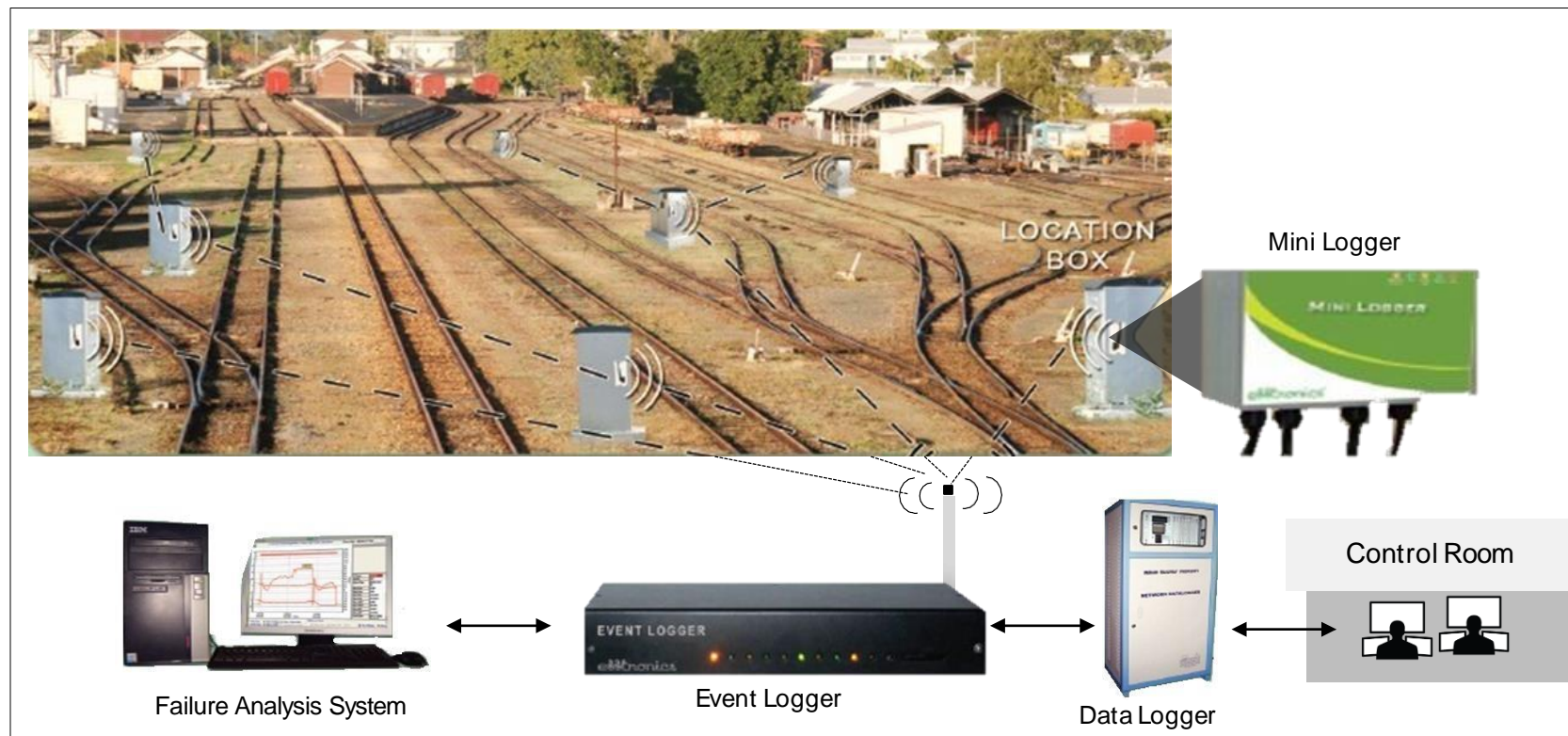


## Power Supply Monitoring

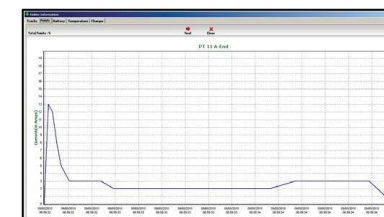


## Signal Monitoring

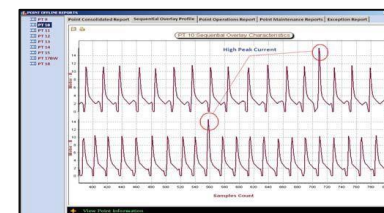




Feed end and Relay end Currents



Point Current Signature



Point Operations Report

1

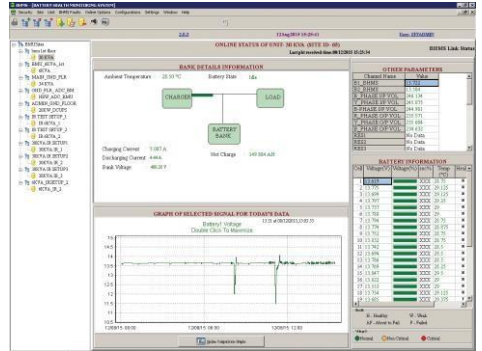
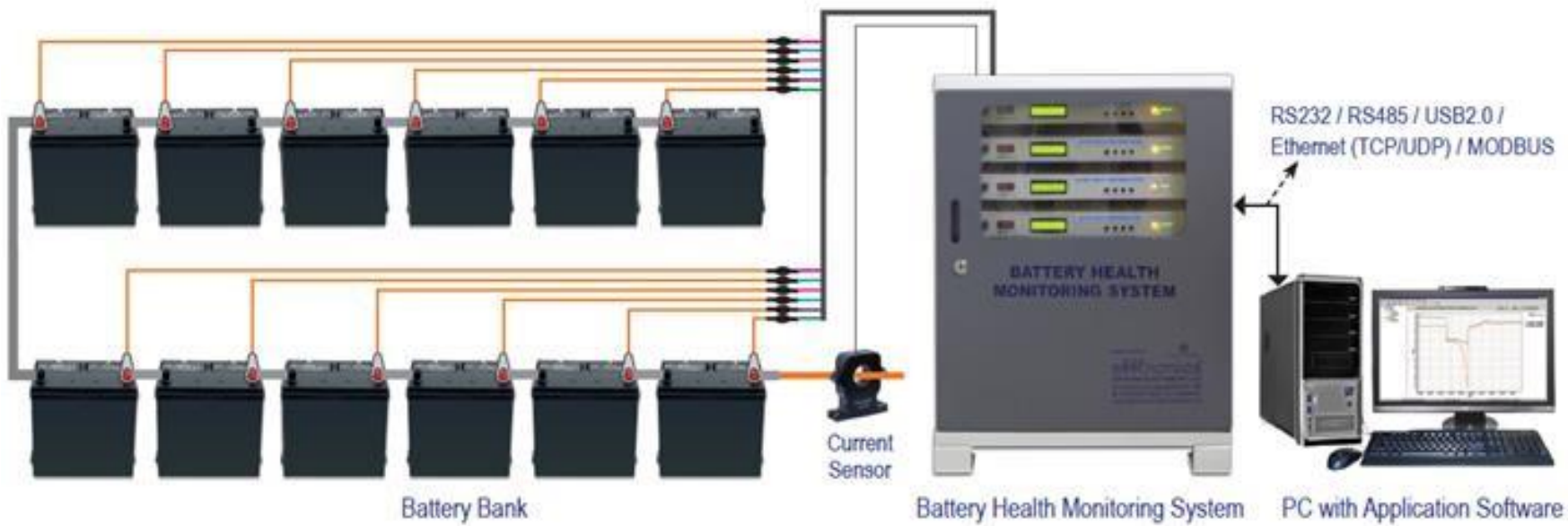
Monitors Point machine operating current

2

Zigbee technology is used to wireless data communication

3

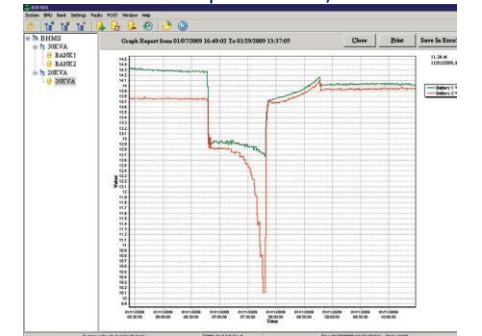
AI/ML to identify and predict failures



Main screen shows the online status of Battery bank state



Graphical representation of Bank parameters,



Graphical comparison of failed battery and healthy battery

## The Benefits of Battery Health Monitoring System



Reduce bank down time



Identify Failures



Health of Cell



Improve bank Life



Remaining Backup Time



Evidence for Warranty



State of Charging



Reduce Maintenance



Real Time Alarms



Remote Monitoring



SHMU monitors signal lamp current and alerts the user in case of abnormality. These alerts are used for predictive maintenance – by which number of failures can be reduced. Also used to reduce the duration of signal failure



Reduced down time



Identify Failures



Real Time Alarms



Remote Monitoring



RS485 &  
Power Supply

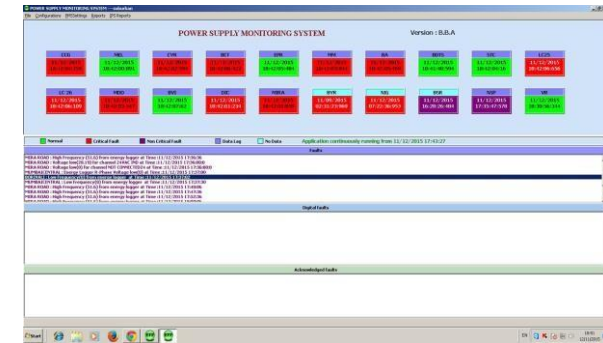
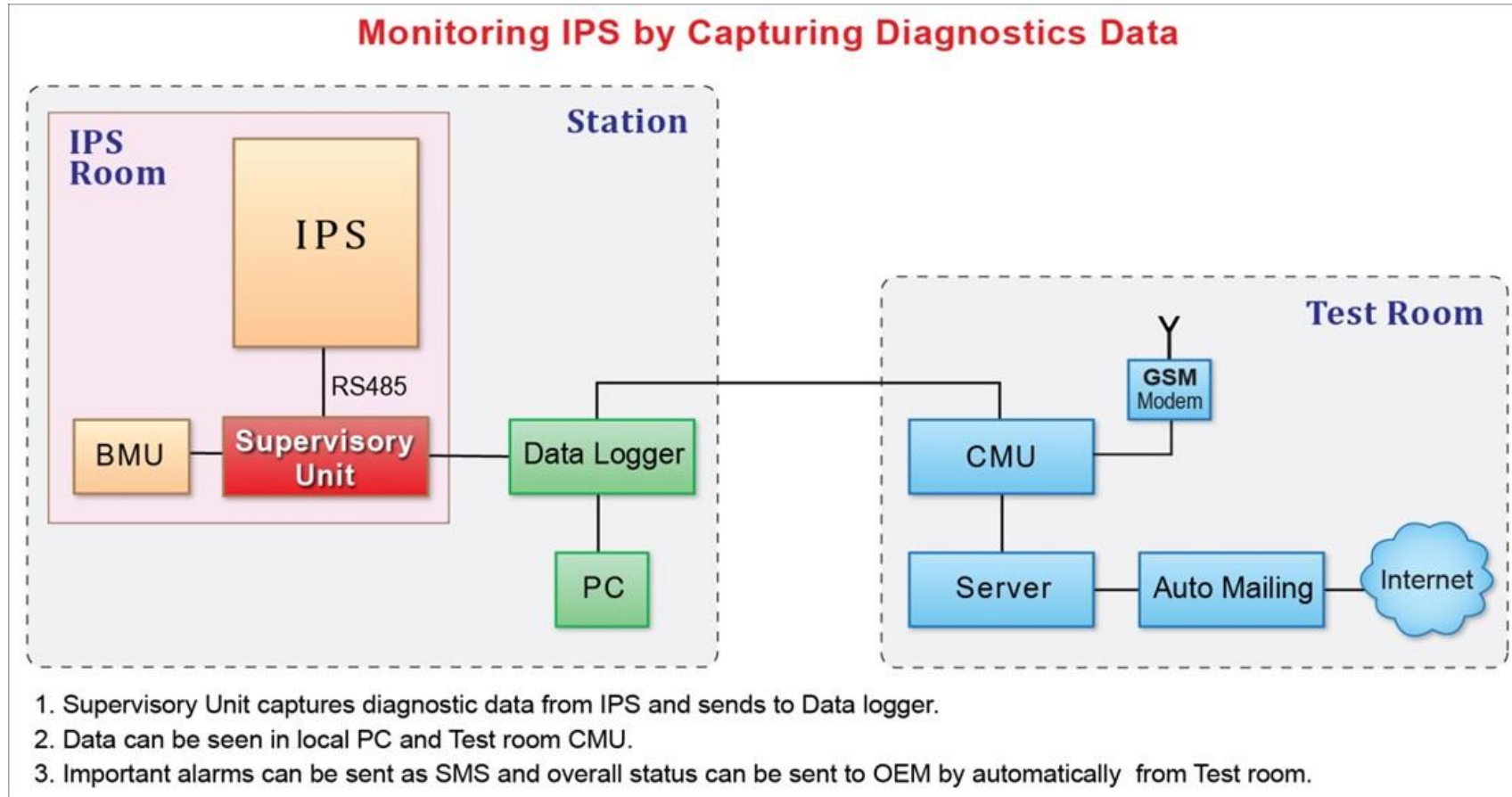


RS485





## Reports & Analytics

[illegible]






1

## Monitors Power supply of each and every station

2

## SMS escalation for Failures



-  Immediate advice / recommendation on failures as they emerge
-  Early warning of system degradation before its eventually leads to failure
-  Enable maintenance staff to have prior knowledge about root cause of failure before attending a site
-  Improved maintenance planning with proper statistical data
-  24/7 monitoring and notifications in case of failures / warnings



Higher Availability



Lower Operating Costs



Increased Reliability



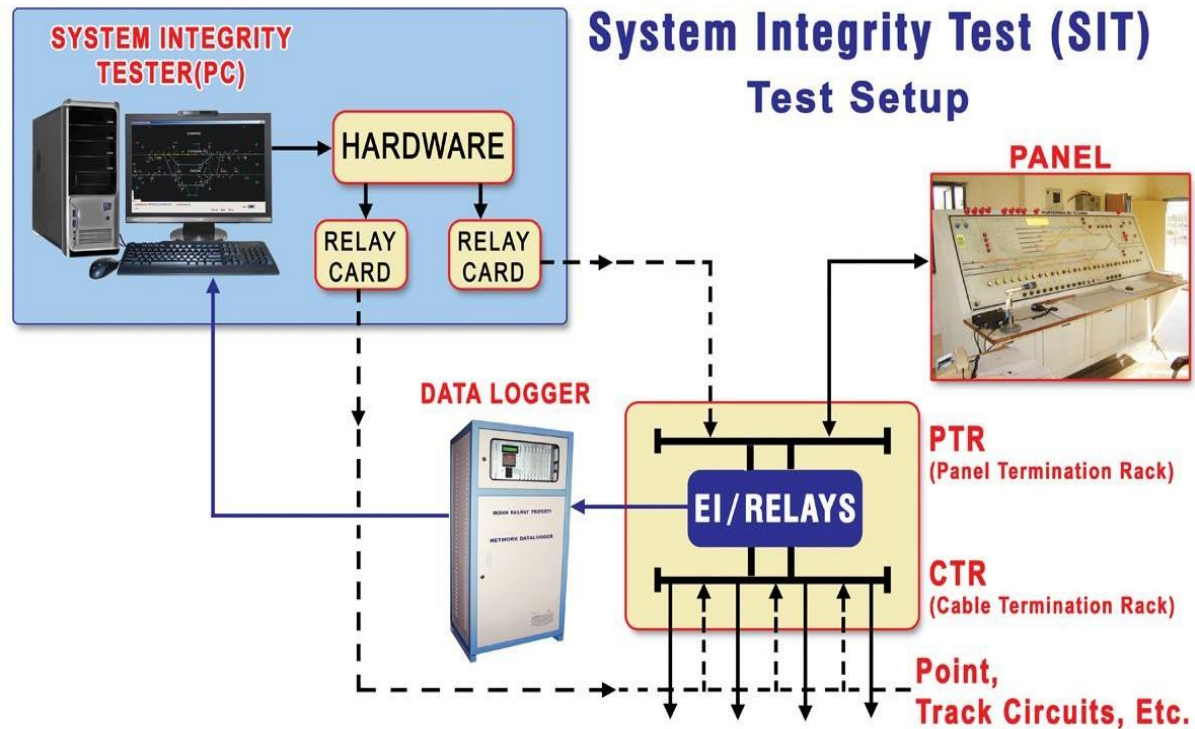
Increased Efficiency



Improved Safety



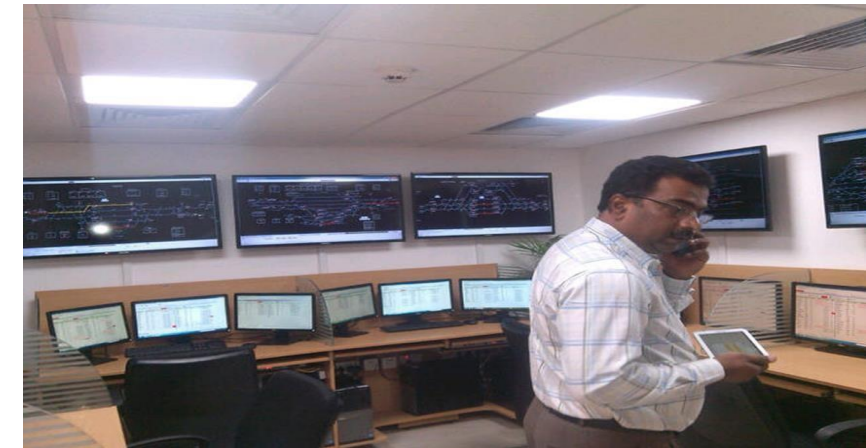
# System Integrity Test



Software & Hardware development & implementation for System Integrity Test as per Table of Control /Route Control Chart.

Conducted at **48** stations

Identified **975** defects of design & implementation of interlocking



- Data Synchronisation between all stake holders of the system
- Data archiving, Reports, Escalation



# SMART CITIES



# Smart Water

## OBJECTIVES



To ensure right quantity of water daily to the public at right time



To ensure right quality of water to be distributed daily



To reduce cost of per unit water



## Current problems



Potability

Limited Supply



Wastage

Uneven Distribution



**Smart Water Management System**

Developed by **efftronics**  
To Provide Insight For Enhancing Wealth  
Visit us: [www.efftronics.com](http://www.efftronics.com)

**WATER SOURCE**

**PUMP HOUSE**

**PRE-CHLORINIZATION**

**Filter Bed**

**CLEAR WATER SUMP**

**Sump Motor**

**Pressure Sensor**

**Flow Meter (Out Flow)**

**Flow Meter (In Flow)**

**Water Tower**

**DISTRIBUTION AREA**

**WATER MANAGEMENT CONTROL ROOM**

**Gateway**

**Internet Cloud**

**RTU-1**

**RTU-n**

**Local Display**

**Chlorine Analyzer**

**Level Meter**

**Flow Meter**

**Pressure Sensor**

**Valve**

**Energy Monitoring**

**Turbidity Meter**

**pH-Analyzer**

**Conductivity Analyzer**

**Chlorine Gas**

**Online Reports**

**Less Chlorine in Distribution**

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**WATER  
MANAGEMENT  
CONTROL ROOM**

## Gateway

Interne  
Cloud

RTU-'n'

## Online Reports

### Less Chlorine in Distribution

### DISTRIBUTION AREA



# Smart Environment

## OBJECTIVES



To improve the Quality of life by improving Quality of living spaces



To prevent the negative effects of pollution on nature and our lives too



To communicate safety measures with public during environmental disasters

Rainfall



Air Temperature



Soil Moisture



Leaf Wetness



Relative Humidity



Atmospheric Pressure



Wind Speed & Direction



Visibility

*and more....*

Measured  
Parameters

## Current problems



Over Pollution



Health Effects



Environmental  
Disasters

Quick Weather  
Forecasting, Analysing &  
Passing Information To  
Public



**efftronics**  
To provide insight for enhancing wealth



# Intelligent Transportation System

## Current problems

## OBJECTIVES



To ensure safe journey with increase in operational efficiency



To provide ultimate control over city traffic system



To provide real-time information for better customer services



Accidents



Traffic Congestion



Environmental impacts and energy consumption



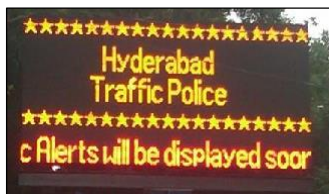
Public transport inadequacy



Adaptive Traffic Signals



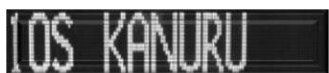
Solar Blinker



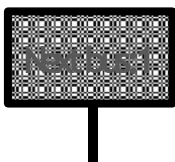
Variable Message Signage



Public Address System

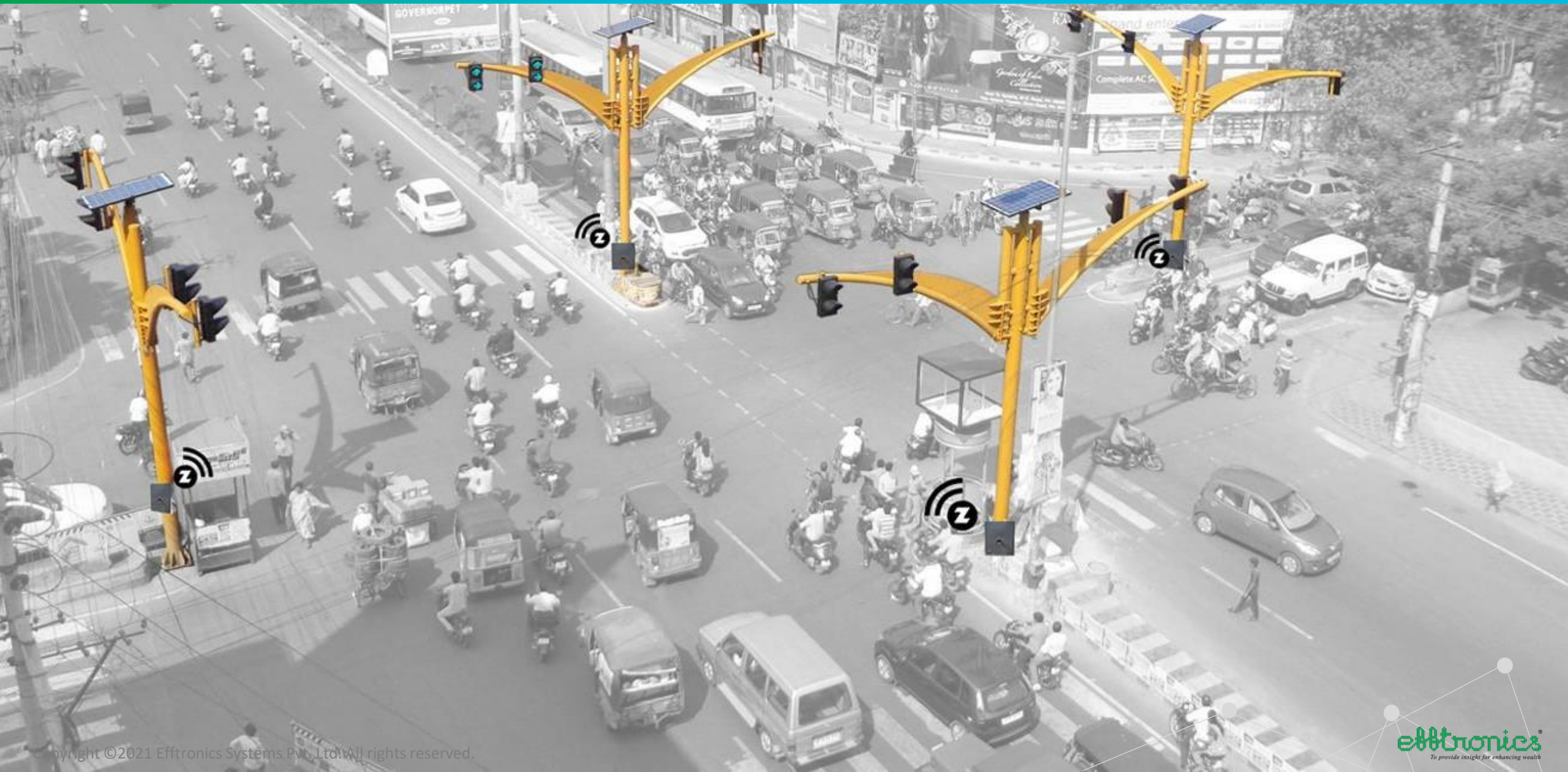


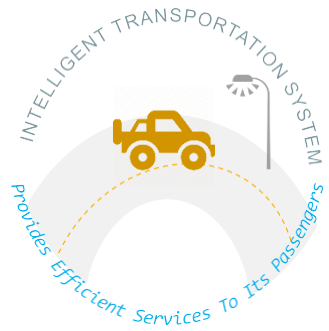
Bus Destination displays



Bus-stop displays

# Smart Cities > Wireless Traffic Management System





# Benefits



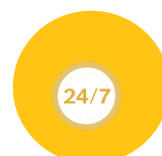
Smooth journey



Monitoring Abnormalities



Reduces Accidents



24/7 Operation



Effective Time Utilization



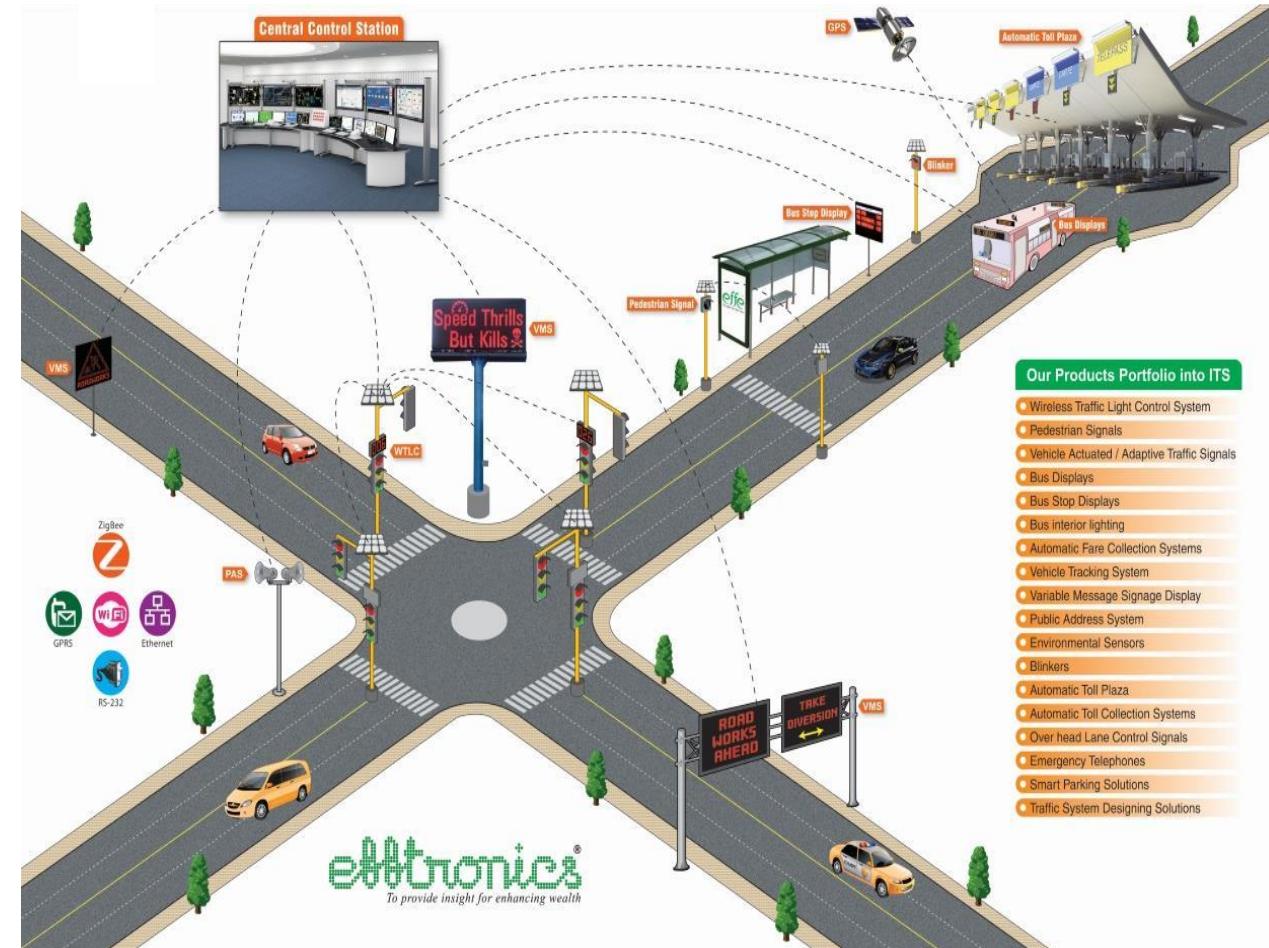
Scheduling



Access Control



Central Controlling



## Architecture



## Benefits



Reduce Accident Rates



Increase Travel Speeds



Reduce Stops, Delays & Queues



Increase Operational Efficiency



Real Time Information management



Create a platform for sharing traffic to other systems



Environment friendly



## Case Study



# Gandhinagar Smart City

Gujarat, INDIA

Gandhinagar Smart City, India's first smart city, and the second planned city after Chandigarh. Efftronics ATCS played a major role in solving the most vulnerable traffic problems and leads to the Vision of the city of being an equitable urban centre that provides a high quality of life to all its citizens.



Reduced travel times by

**12-20%**



**20-40%**

Less waiting time



Reduce Number of stops  
in a corridor by

**15-30%**



**10-20%**

more friendly to  
environment

Based on TTI and Model  
estimates from [www.sim-air.org](http://www.sim-air.org)



# SMART BUILDINGS

## Life made Easy, Secure & Smart

*Indoor Air Quality*



*Appliance Control*



*Safety & Security*



*Gate & Blind Control*



*Lighting Control*



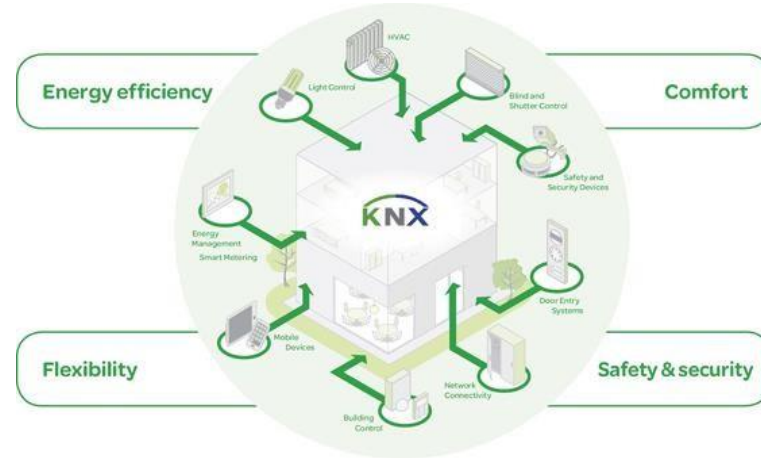
*Energy Monitoring*





# SMART BUILDING

## Member of



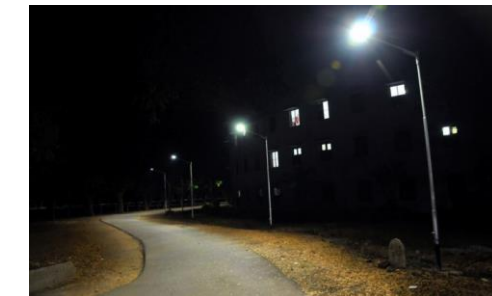
*To provide insight for enhancing wealth*



# SMART LIGHTING

## We Sell Light Not Lights

- Dynamic theme Lighting
- Distribute light where you want
- Control through SMART Apps
- Tailor made lighting solutions
- High CRI , Energy Efficient
- Mentioned as Smart Lighting Vendor in Gartner Report



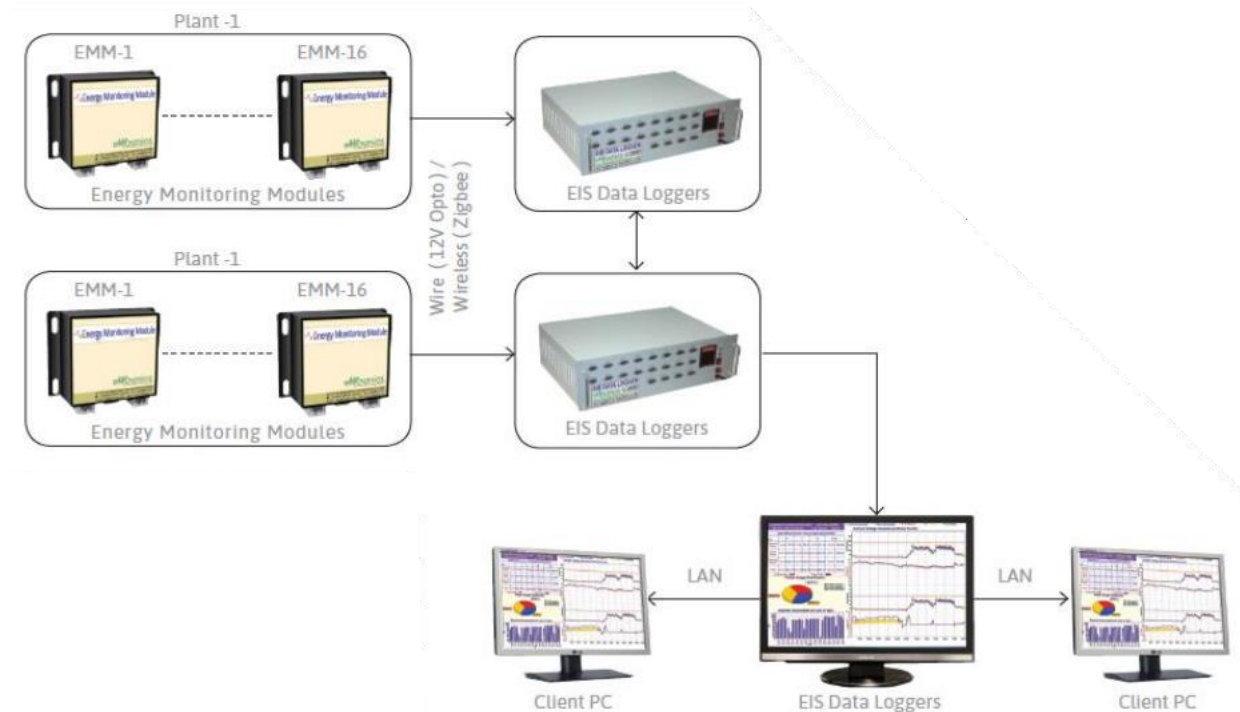


# SMART BUILDING

## Indoor Air Quality Monitoring System



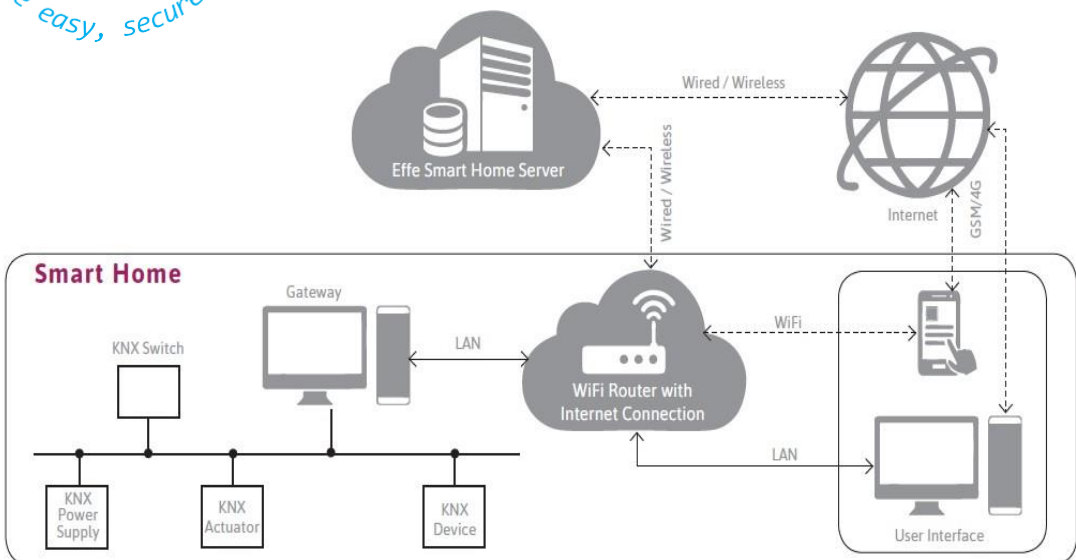
## Energy Information System





# SMART BUILDING

## On-line Distributed Appliance Control



## Lighting & Control



## Gates & Blind Control



Motion Detection

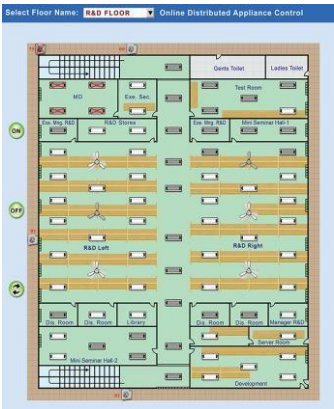


Occupancy Detection

## Safety & Security



Ambient user Lighting Control



# Internet of Things

## Real Time Location Tracking System



Can track indoors

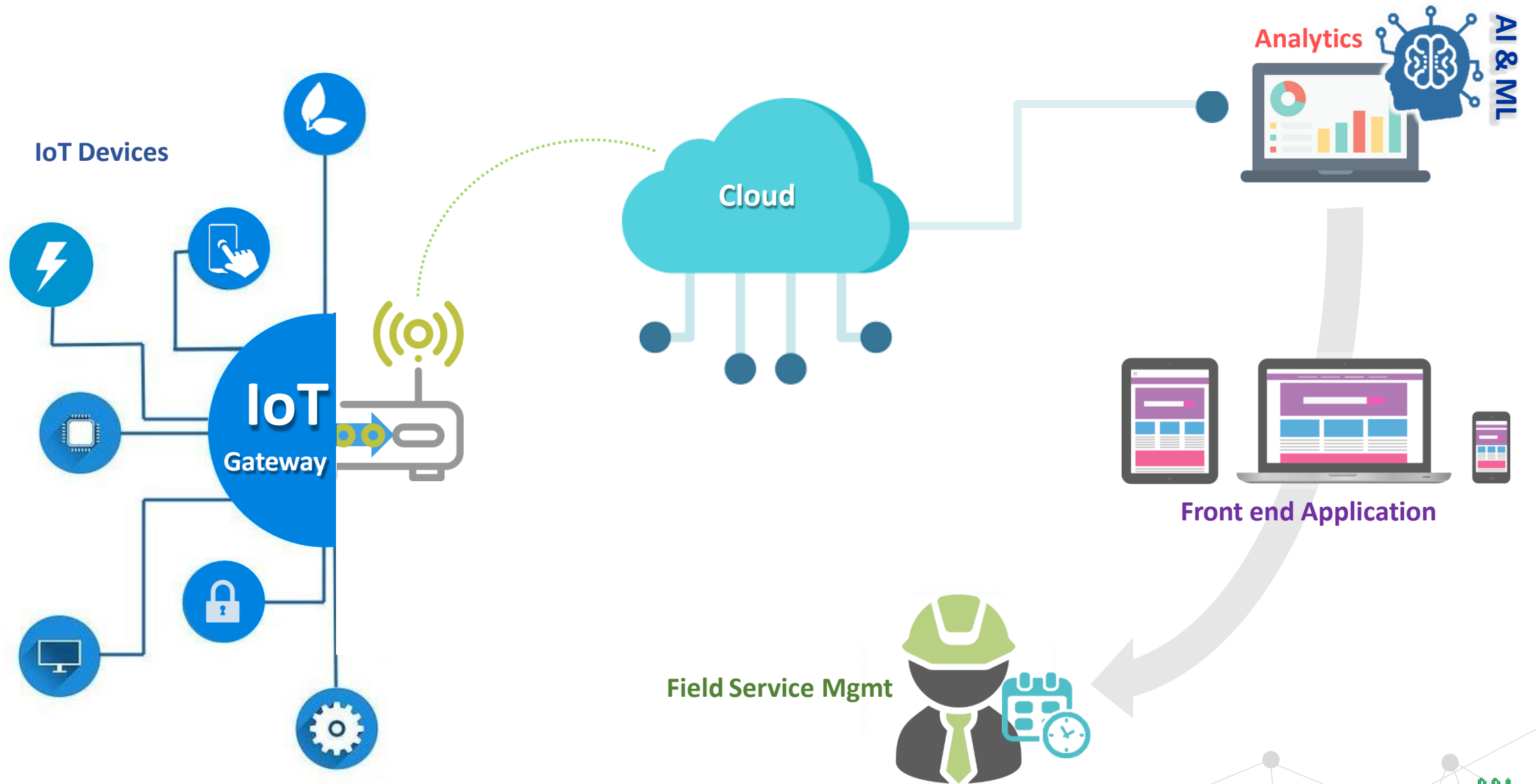
- ✓ Critical Assets
- ✓ Workers in Critical areas

## Access Control System



- Exported to USA








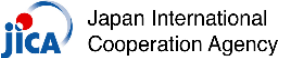










# IIOT> Predictive Maintenance System



... and the multiple awards and recognitions received



# CUSTOMERS

# THANK YOU



*To provide insight for enhancing wealth*

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