MAY, 2022

Digital Platform to Optimize Operations and Maintenance for Critical Infrastructure such as Transportation Systems and Industrial Plants

Mitsubishi Heavy Industries Engineering
Daisuke Noutomi

Company Profile

CO_2 capture plant

Transportation System

Corporate Overview

Company Name

- Mitsubishi Heavy Industries Engineering, Ltd. (MHIENG)

Establishment

- January 1, 2018

Head Office

- Yokohama, Japan

Head Office and Mihara Site

Head Office Yokohama

Mihara Sites Hiroshima, Japan

Wadaoki Plant

Itosaki Plant and Kohama Plant

CO_2 Capture Plants Achievements

The Largest CO_2 Capture Plant

1999 Malaysia
210 Mt/d

2005 Japan
330 Mt/d

2006 India (Aonla)
450 Mt/d
CO_2 Recovery (CDR) Plant - IFFCO AonlaUnit (India)

2006 India (Phulpur)
450 Mt/d
CO_2 Recovery (CDR) Plant - IFFCO Phulpur Unit (India)

2009 India (Kakinada)
450 Mt/d

2009 Bahrain
450 Mt/d

2009 UAE
400 Mt/d

2010 Vietnam
240 Mt/d

2011 Pakistan
340 Mt/d

2012 India (Vijaipur)
450 Mt/d

2014 Qatar
500 Mt/d

2017 Japan
283 Mt/d

2016 U.S.A. (WA Parish)
4,476 Mt/d

Transportation Achievements

Tokyo
Yurikamome

Saitama
New Urban Transit
“New Shuttle”

Nippori-Toneri Liner

Hiroshima
New Rapid Transit
Astram Line

Taiwan
High Speed Rail

Macau LRT

Singapore
Sengkang-Punggol LRT

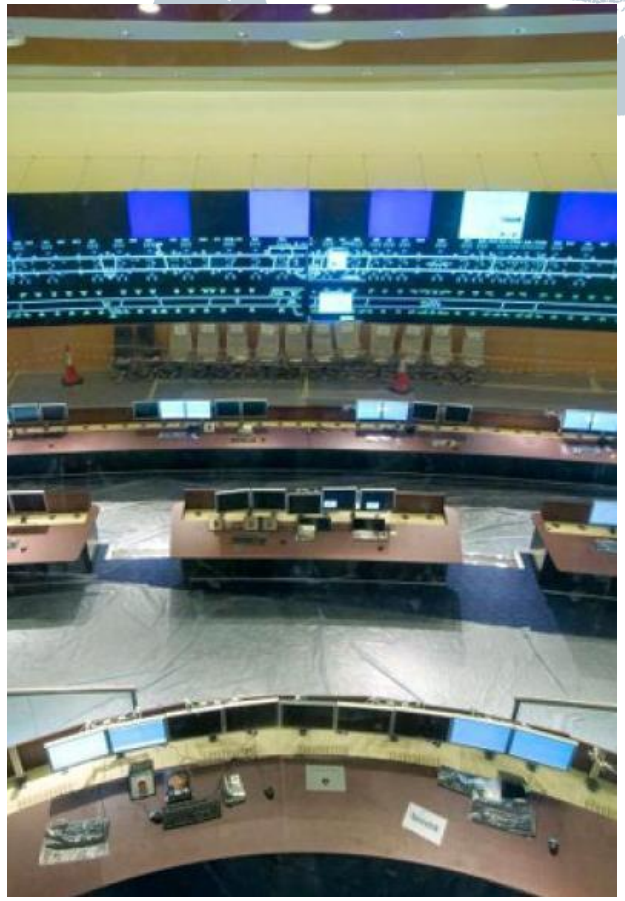
Dubai Metro

Orlando
International Airport APM

Washington
Dulles International
Airport

Tampa
International Airport
APM

Atlanta
International Airport



MIHARA Test Center

On-premise facility. approximately 3.2 km in length railway loop track.

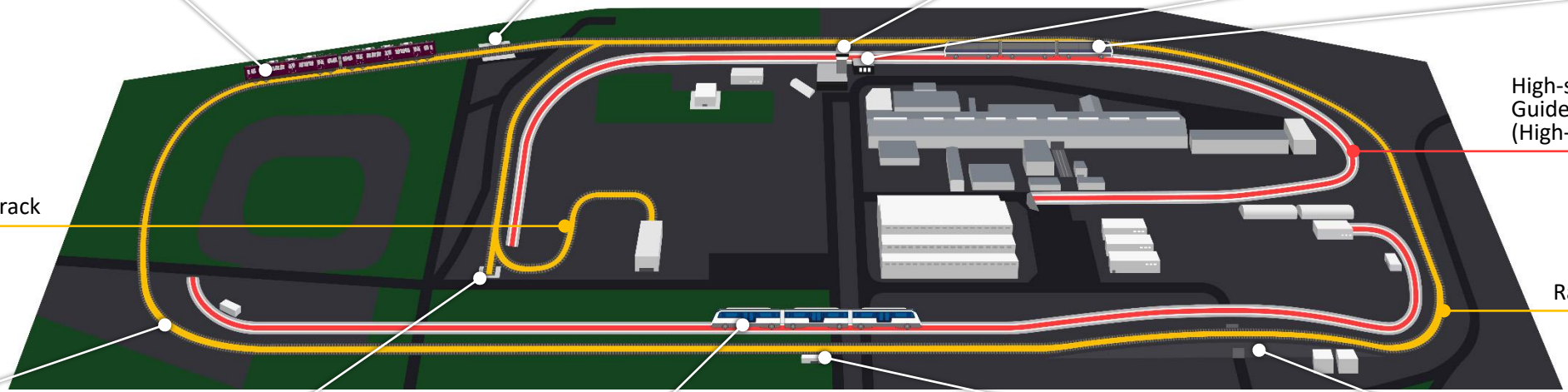

MIHARA-Liner


Main Track Pit


Operations Control Center (OCC)
Operation Control Room


Platform North


AGT




Railway Test Track
(Dual-Gauge/3.2 km Loop Track)


Lead Track Pit


Super AGT
(High-speed AGT)

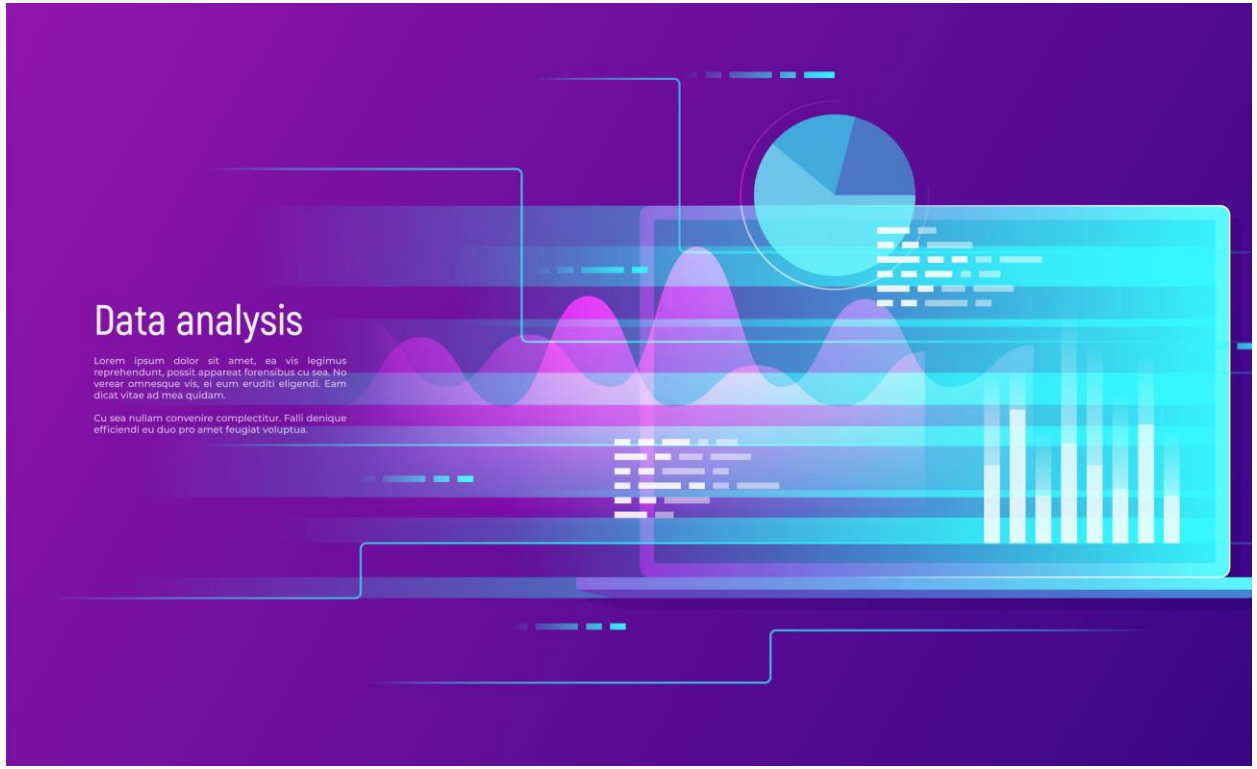

Platform South


Gradient Track (50‰)
(Ballast and
Slab track)

Digital Platform for Remote Monitoring

Expected Benefits for the Operators

Here are expected benefits that the operator will enjoy;



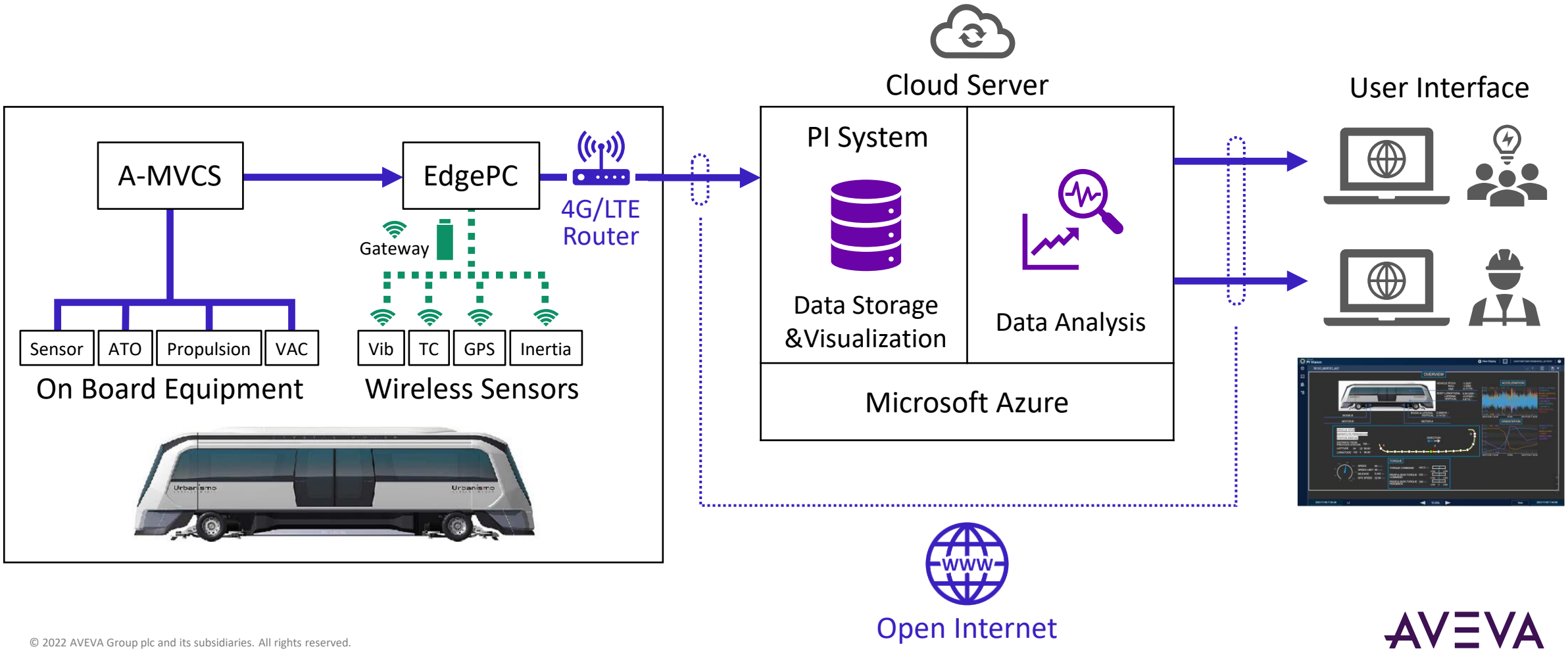
- Improve availability of the facilities
  Minimization of downtime by preventive maintenance
- Optimized operations and maintenance costs, and resources
- Safety improvements and accident prevention

Application of PI System

- Taking advantage of PI System, Mitsubishi Heavy Industries Engineering, Ltd. has built a platform for real-time remote monitoring of the operational status of new transportation systems such as the automated guideway transit (AGT) system.
- Since PI System has also been used for the CO_2 Capture plant, we were able to construct it in a short period of time.
- Our company also has test track equipment in Hiroshima Prefecture, where its rolling stock plant is located, and provides an environment for conducting various tests.

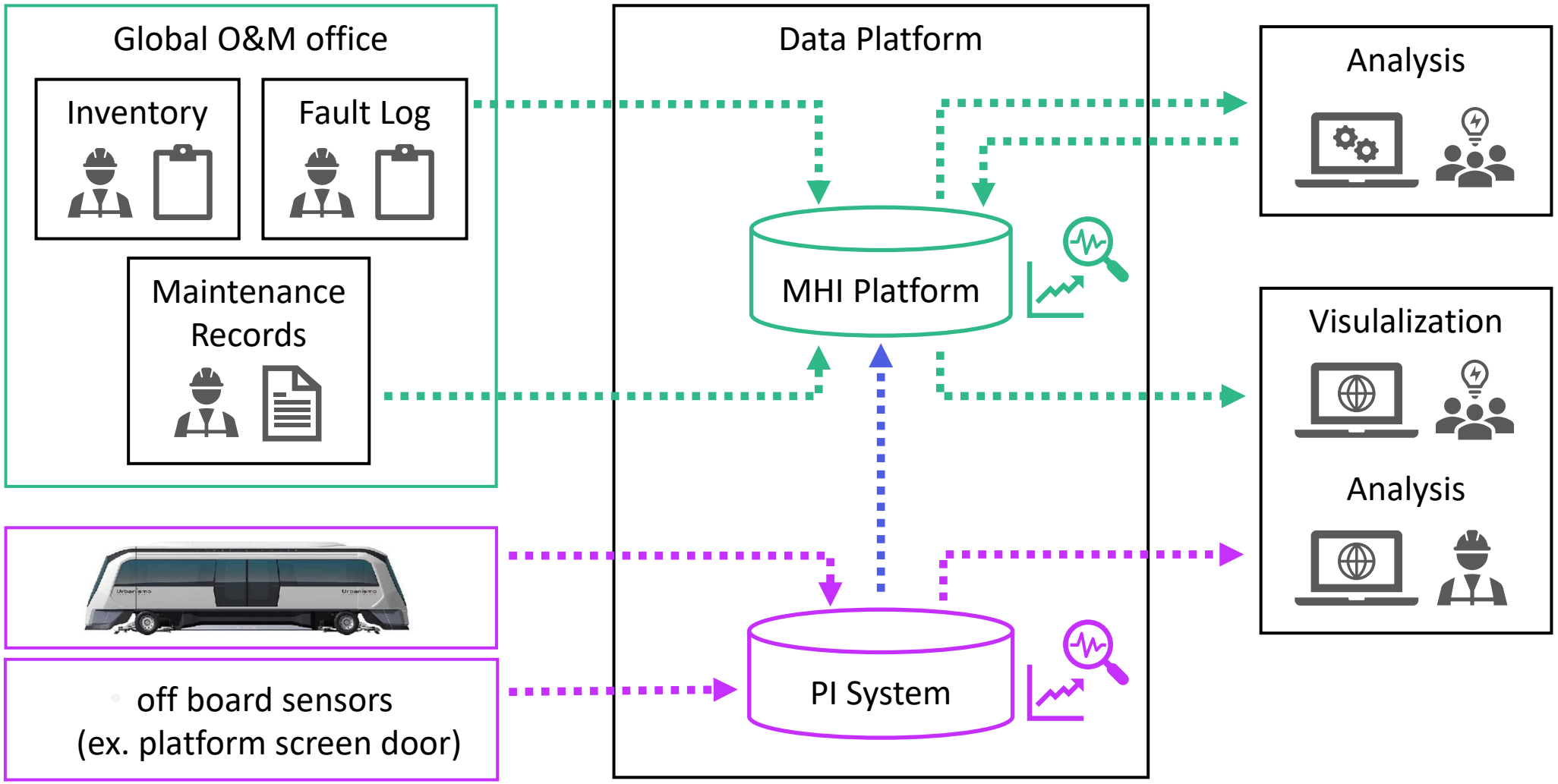
Remote Monitoring for Transportation System

Data transmission by 4G/LTE from running vehicle to PI for monitoring and analysis.

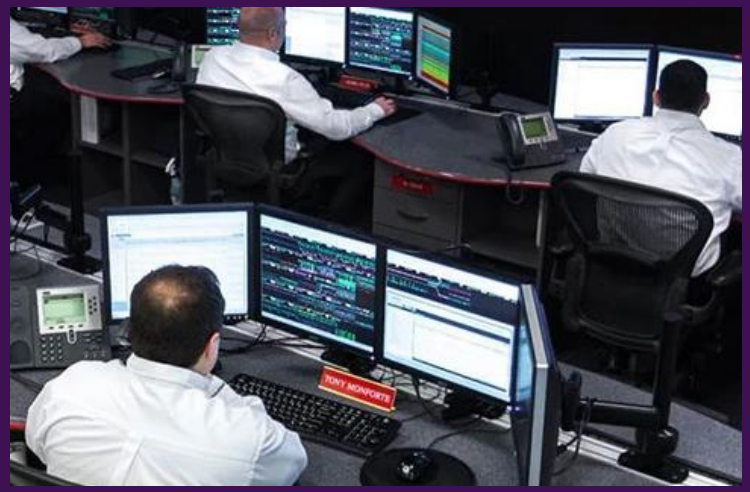


Monitoring Screen (sample)

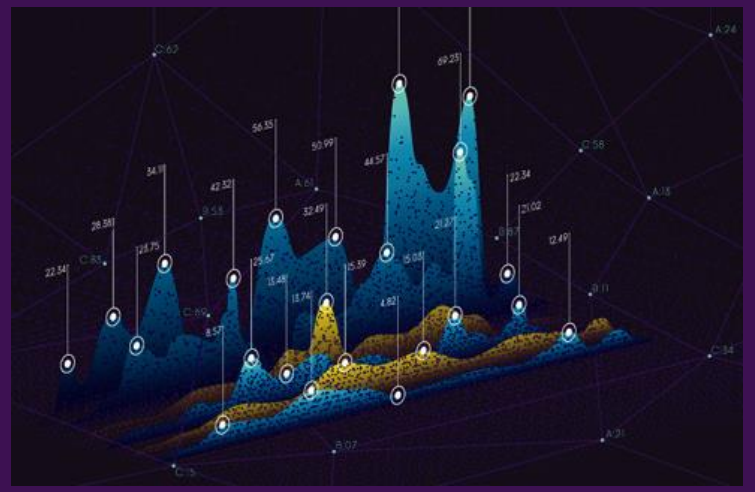
Integrating with Maintenance Records



Remote Monitoring for CO_2 Capture Plant

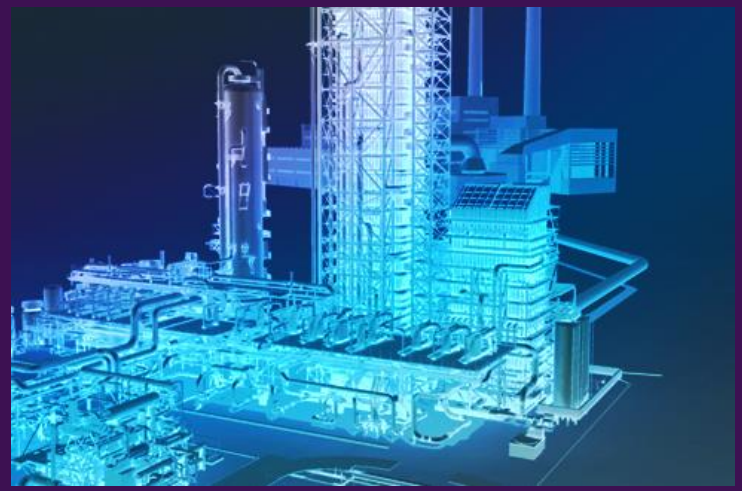


Remote Monitoring



Data Analysis

Predictive Maintenance

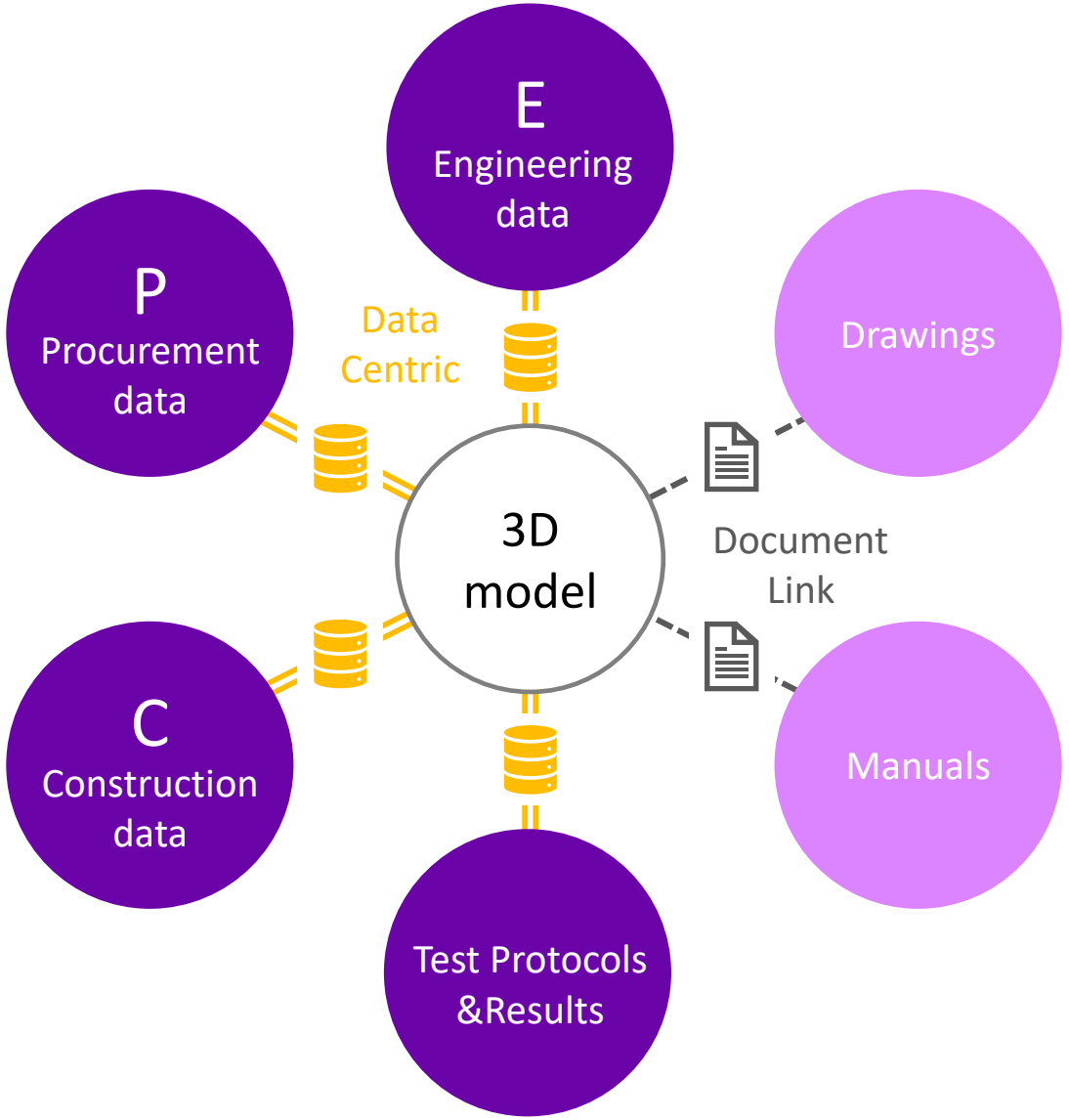


Product Development

Data Centric Engineering

Data Centric Engineering (demo)

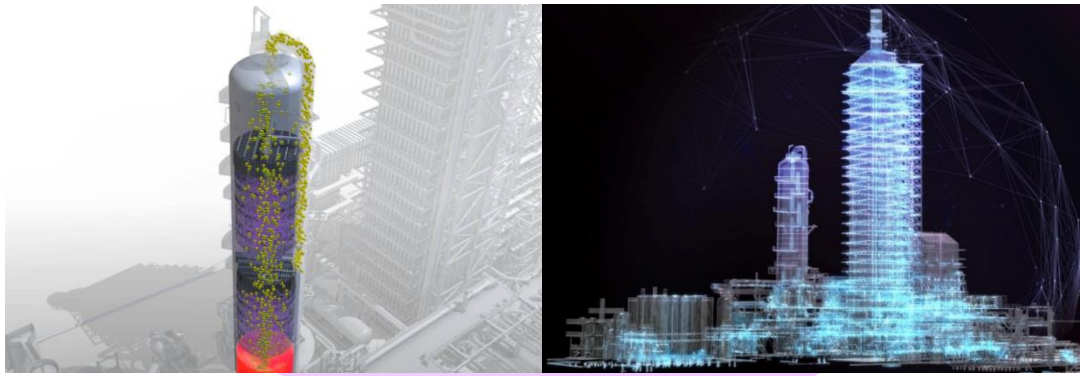
- 3D model + engineering data + drawings + manuals + test reports and more.
- All engineering data and information are in there.

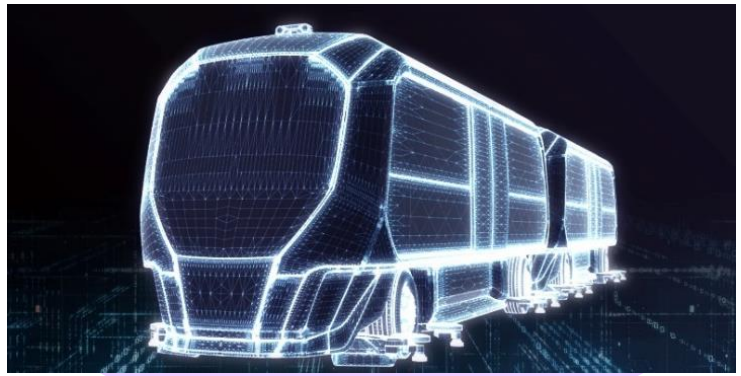


Our Digital Twin

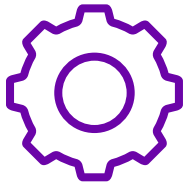
Digital Twin

Now we are developing advanced digital twin combining DCE, remote monitoring and process simulator so that our client can enjoy more benefit out of our technology.





Digital Platform to Optimize Operations and Maintenance for Critical Infrastructure



Challenge

- Collecting operational status from the moving vehicle & providing real-time remote monitoring
- All related data including record & log of O&M, Engineering data is to be CONNECTED in unified environment effectively
- Data analysis to obtain benefits is to be provided

Solution

- Applying the AVEVA PI System for collecting & storage & visualizing of operational data from the products
- Related data in different tools, applications and etc., is to be well-interfaced to common unified environment

Benefits

- Improve availability & increasing safety by minimization of downtime due to fast aid against accident and preventive maintenance
- Optimized O&M cost and resources by applying effective condition-based maintenance

AVEVA

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