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2019 OSISOFT MUMBAI SEMINAR

# Using PI System in the field of Dredging

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# Using PI System in the field of Dredging

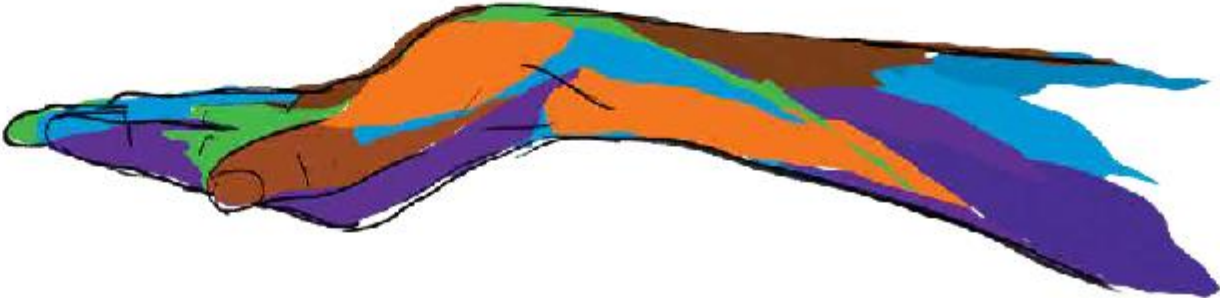
## Content

- Introduction
- Challenges
- Solution
- Use cases
- Goal






Growth  
with  
Goodness



Adani Group Presentation



## Actions that define a philosophy.



### Vision

To be a world class leader in businesses that enrich lives and contribute to nations in building infrastructure through sustainable value creation.



### Group values

#### Courage

We shall embrace  
new ideas and business

#### Trust

We shall believe in our  
employees and other  
stakeholders

#### Commitment

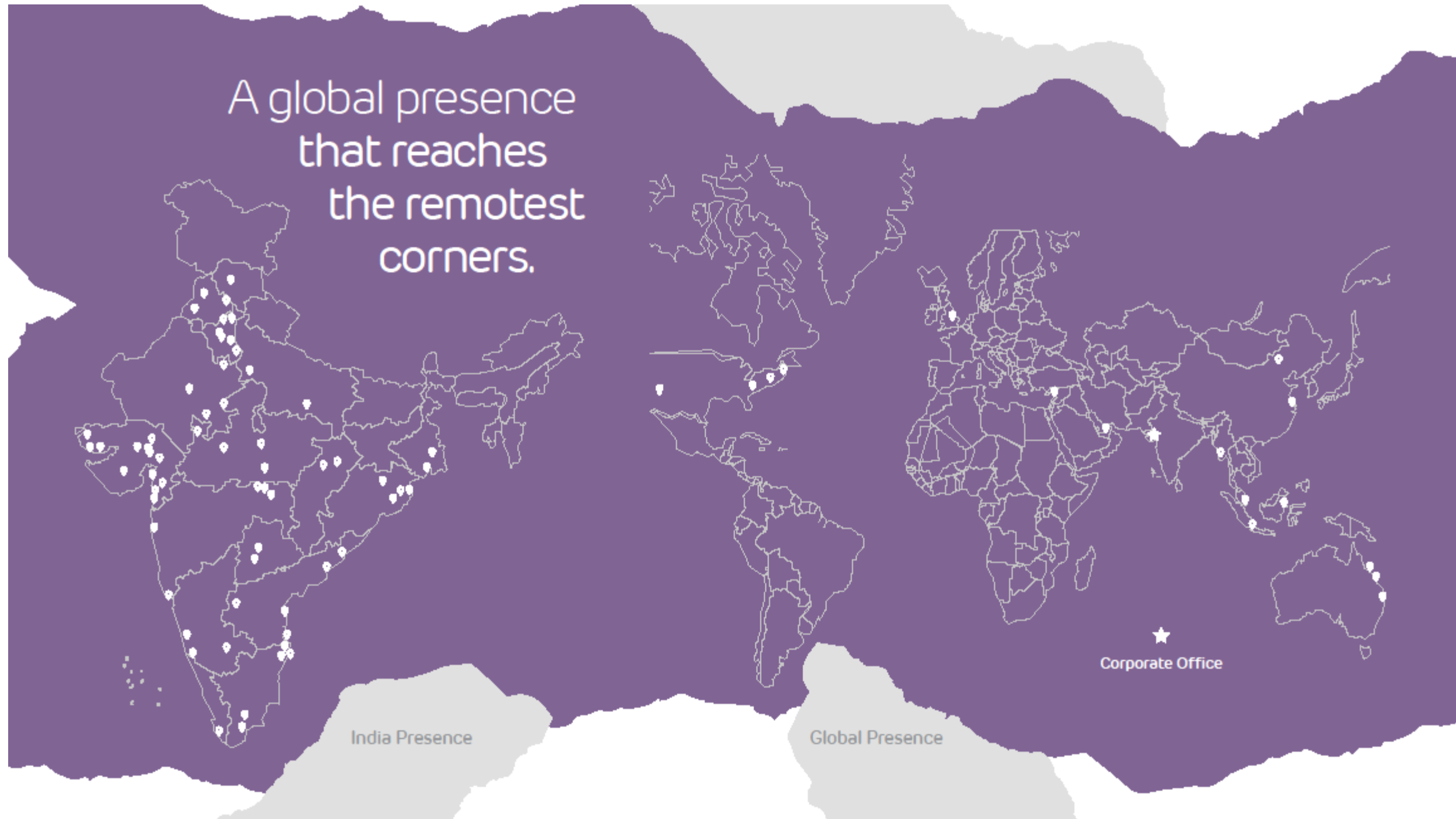
We shall stand by our  
promises and adhere to high  
standards of business

# Uplifting lives in more ways than one.

## Adani Group Portfolio



A global presence  
that reaches  
the remotest  
corners.

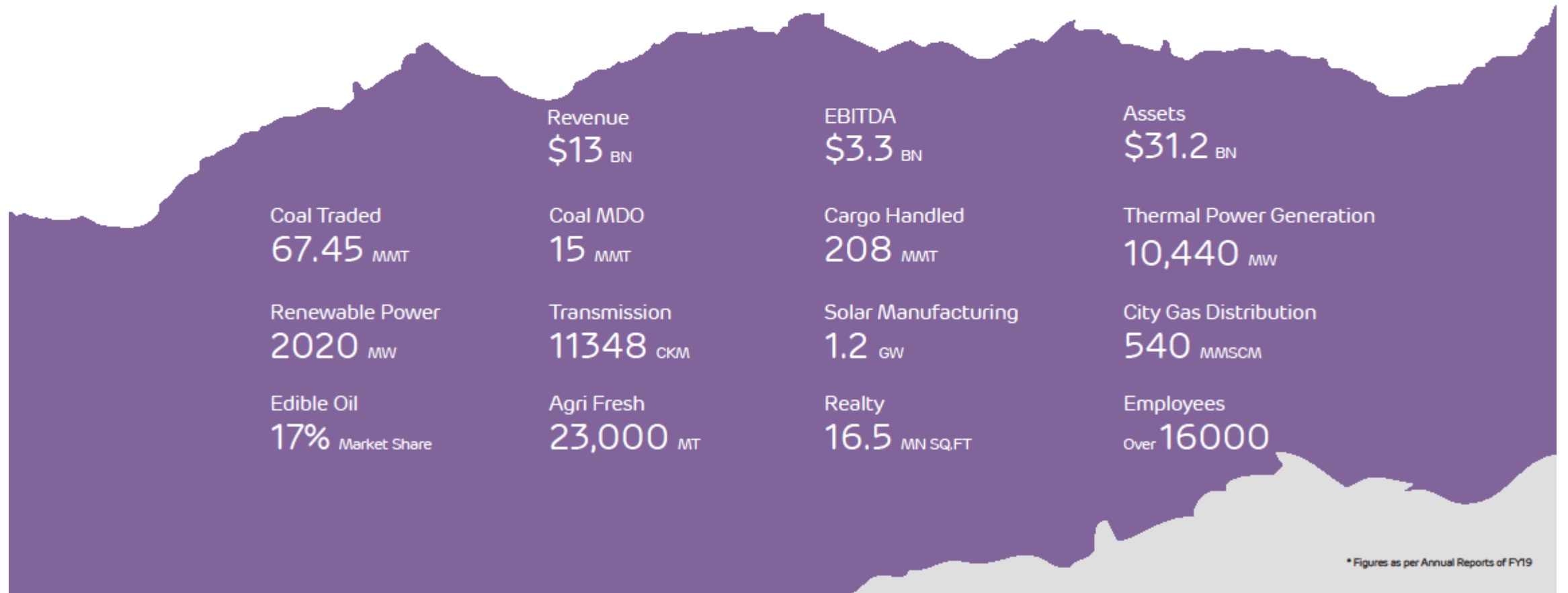


India Presence

Global Presence

★  
Corporate Office

# Contributing to the growth story of India - a quick glance at the Adani Group's performance for the financial year 18-19





## Ports

Servicing 15% of the market share in Indian cargo/logistics with 10 domestic ports in six maritime states. The largest commercial port operator in India, bringing Indians closer to the world.

## SEZ

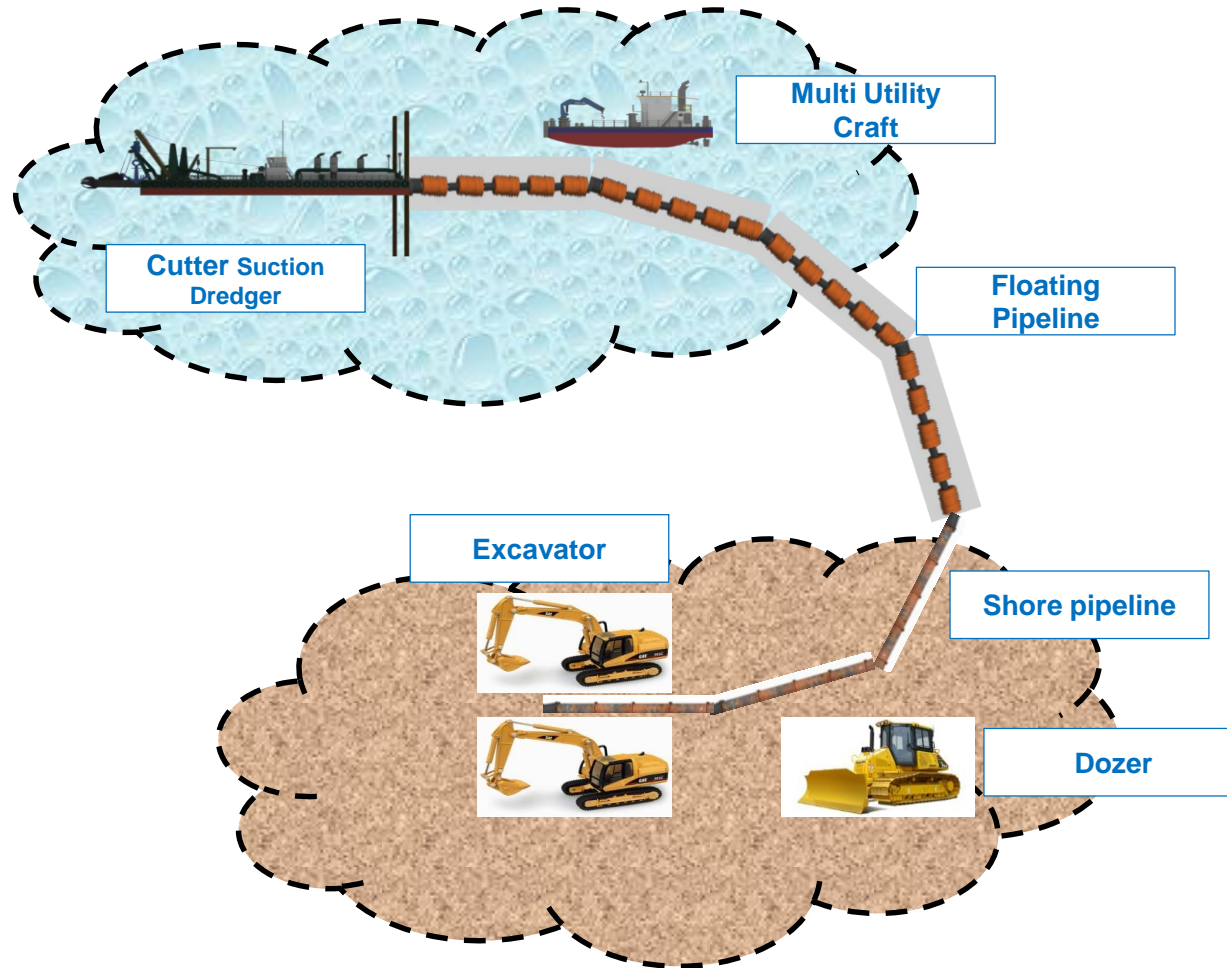
Spanning across an area of 15,000 hectares, the Mundra Economic Hub is the gateway for Indian exports and imports. India's largest port based multi-product manufacturing zone.



# Introduction to Adani Dredging

- Starting building Dredging fleet in 2005.
- Planned high-paced growth in the port sector was the reason to build fleet
- APSEZ currently owns a large fleet of 23 dredgers; the largest capital dredging capacity in India.
- APSEZ provides Dredging and Reclamation solutions for:
  - Port and harbour development
  - Maintenance of navigable areas of ports
  - Inland waterways dredging
  - Environmental dredging
  - De-siltation of Inland Water bodies

# Introduction to Adani Dredging



**Basic Dredging  
& Reclamation  
Operations  
through CSD**

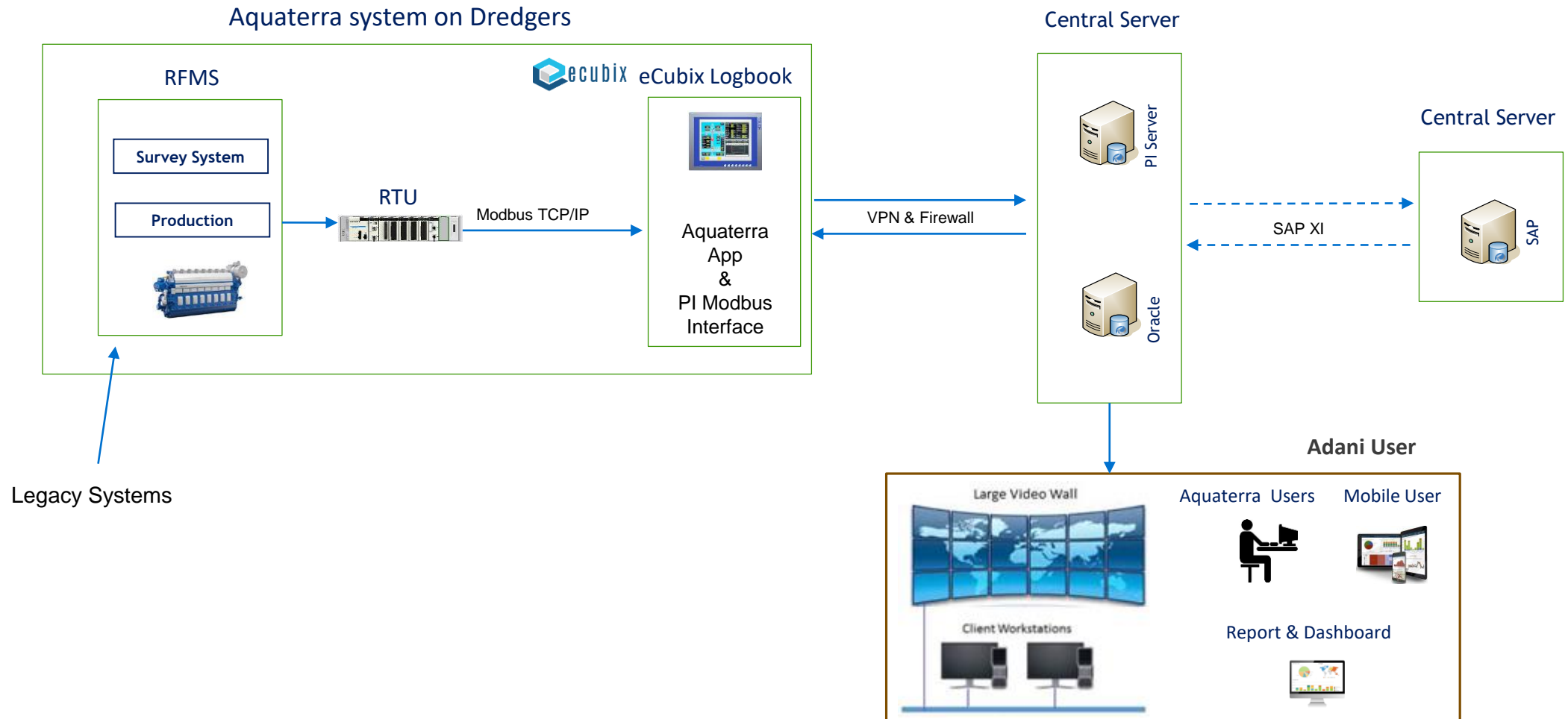
# Problem Statement

# Challenges faced from an Operations Excellence Perspective

- Isolated Platforms
- Real time visibility of the operations; operator and equipment performance
- Elimination of human error
- Single source of true data
- Proper utilization of resources
- Identification of actual location of work
- Equipment failure
- Planned Maintenance/ Breakdown
- Integration of Legacy systems
- Fuel Consumption data vs operational conditions

# Solution Architecture

# Solutions – Aquaterra Architecture



# Realtime Dashboard

## What is it / capabilities

- Graphical representation of entire operations
- Live status reporting
- Easy to grasp colour coded visuals
- SMS / Email Notifications on alerts
- Accessible anywhere on Adani Network

## Benefits

- **Live Status: Real Time Data on fuel consumption and production data**
- Glance at KPIs quickly
- No need to call individuals/operators and check. They can be called if a discrepancy is found
- People can focus on core ops activity rather than spending time on calling up / checking / coordinating and providing data fetching operations/Equipments data on mobile

# Realtime Dashboard

PI Coresight
Dredger\_Overview
Ad Hoc Display
ADANIwcs.support

DATE : 30-Aug-18 15:44:00

DREDGER ENGINE		AUXILIARY ENGINE		UoM
Engine Speed	650.00	1603.00		rpm
Lube Oil Pressure	437.50	449.04		bar
Coolant Temperature	48.00	83.00		C'
Boost Pressure	0.00	21.50		kPa
Fuel Flow Rate	44.15	46.55		lph
Fuel Oil Pressure	255.00	390.00		kPa
Battery Voltage	25.00	25.00		Volt
Engine Running Hours	44667.27	54512.04		hour
Left Turbo Inlet Pressure	0.00	0.00		kPa
Right Turbo Inlet Pressure	0.00	0.00		kPa
After Cooler Temperature	32.00	34.00		C'
Fuel Oil Difference Pressure	7.93	1.00		kPa
Lube Oil Difference Pressure	31.46	34.50		bar
Exhaust Temp Right	77.00	287.00		C'
Exhaust Temp Left	78.98	256.00		C'

PRODUCTION SYSTEM		
Swing Width (m)	24.47	m
Cutter Depth (m)	-2.17	m
Spud Car Position(m)	0.14	m
Production T/H	0.00	min
Production m3/h	0.00	sec
Total Production (m3)	272263.94	m3
Total Production(Ton)	367223.84	Ton
Velocity (m/s)	0.00	m\sec
Density	1.00	
Swing Angle (Deg.)	23.00	deg
Trunion	3.57	m
Draught	2.12	m

PRODUCTION SYSTEM		
Heading	207.01	deg
Line	1.00	
Cutter East	254214.45	
Cutter North	2332722.50	
DMG	31.74	
DTG	75.06	
Cutter Depth	-3.09	m
Cutter Correct Depth	-9.35	m
Spud East	254245.30	
Spud North	2332776.00	
Tide	-6.29	m
Ladder Angle	-5.51	deg

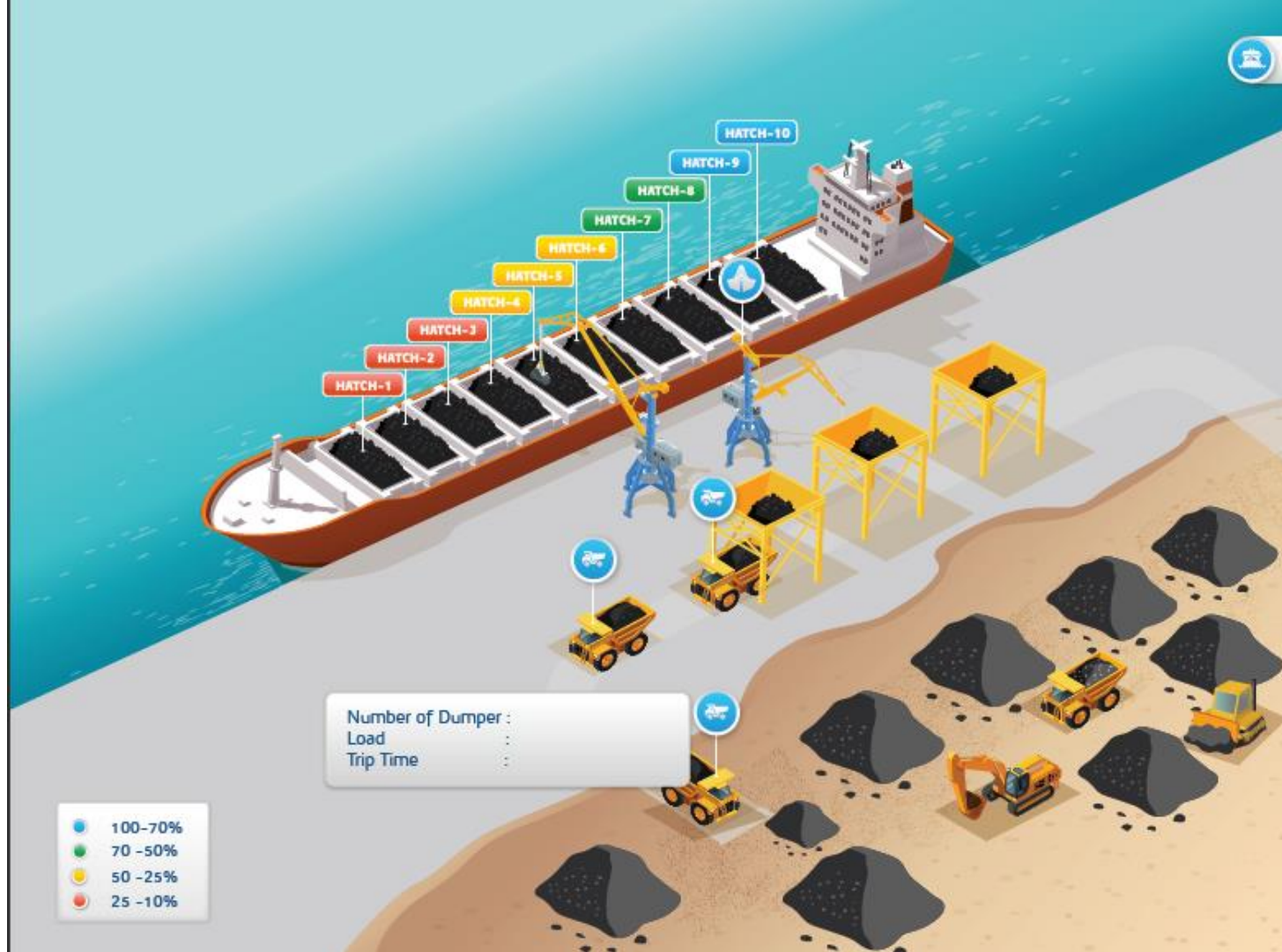
DREDGER OPERATION SYSTEM		
Ladder Winch Pressure	0.46	bar
Side Winch Pressure	10.16	bar
Cutter Pressure	0.16	bar
SUBM. Pump Vaccume	-0.99	bar
Dred. Pump Pressure	0.03	bar
Gland Pump Pressure	0.38	bar
Dredging Hours	1147.27	Hrs

FUEL SYSTEM		
Main in Fuel Flow Rate	422.35	L\H
Main in Fuel Totalizer	592359.38	Litre
Main Out Fuel Flowrate	417.86	L\H
Main Out Fuel Totalizer	413975.50	Litre
Aux. in Fuel Flow Rate	828.20	L\H
Aux. in Fuel Totalizer	529831.63	Litre
Aux. Out Fuel Flowrate	808.70	L\H
Aux. Out Fuel Totalizer	784654.13	Litre
Net Flowrate	386.30	
Net Totalizer	88.91	

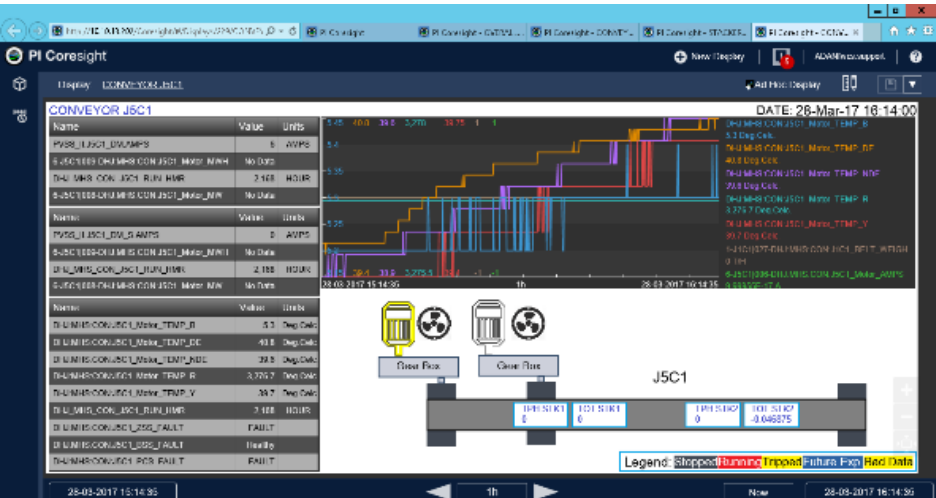
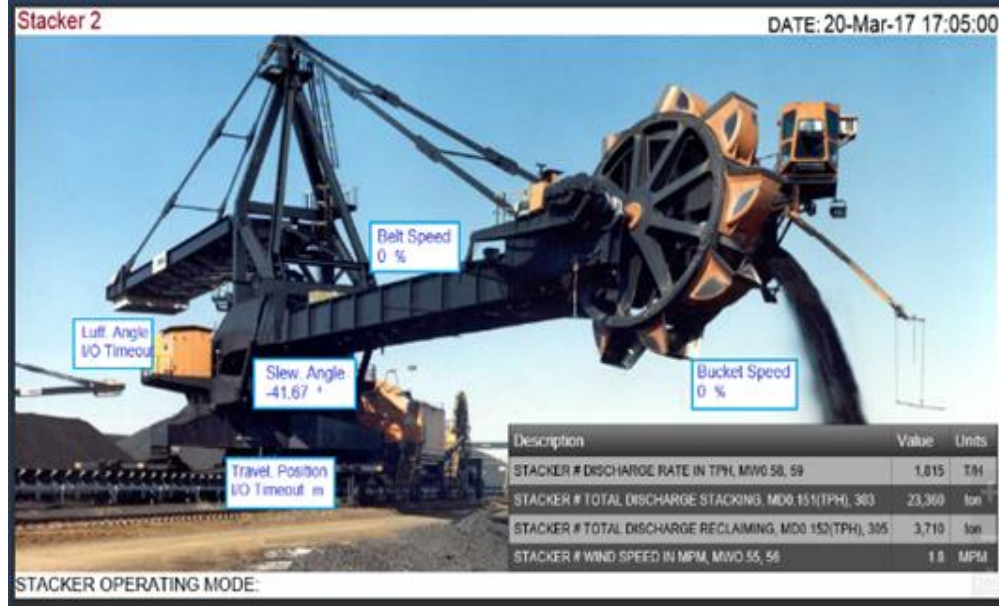
8/30/2018 2:44:32 PM
1h
Now
8/30/2018 3:44:32 PM



# Realtime Dashboard

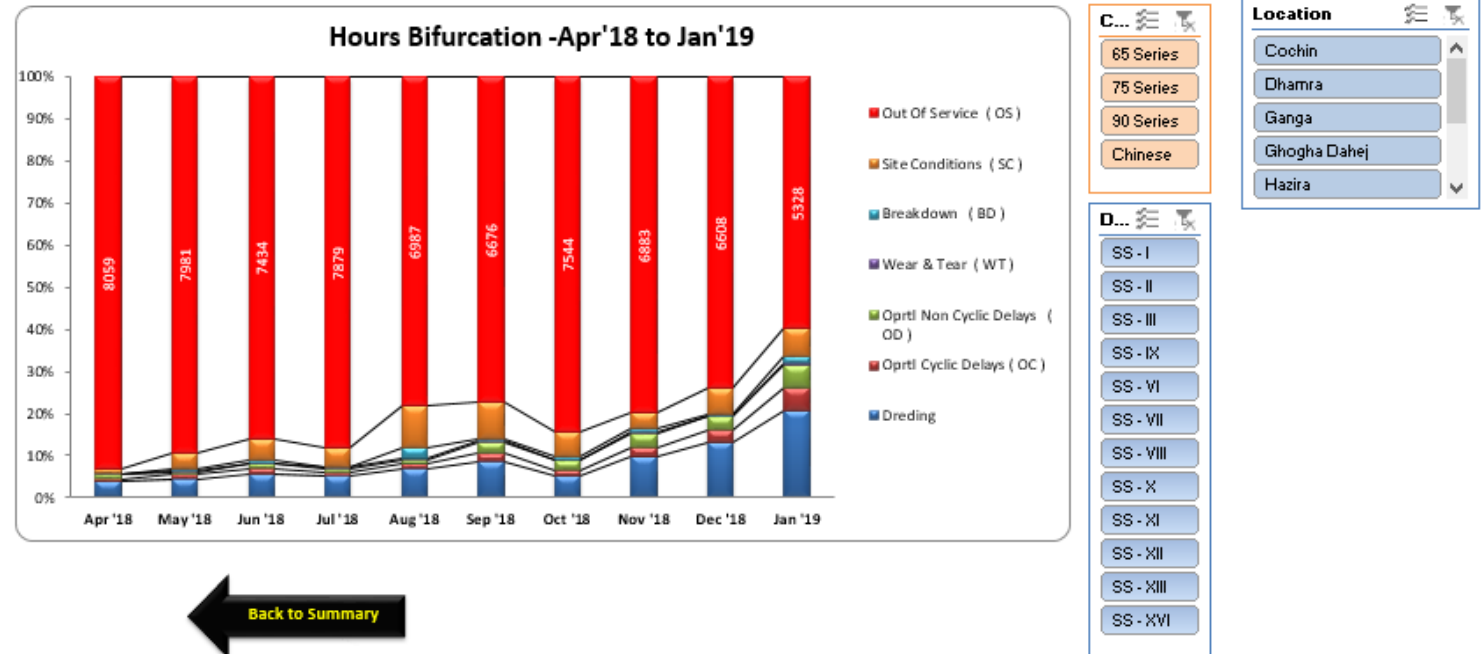


# Realtime Dashboard

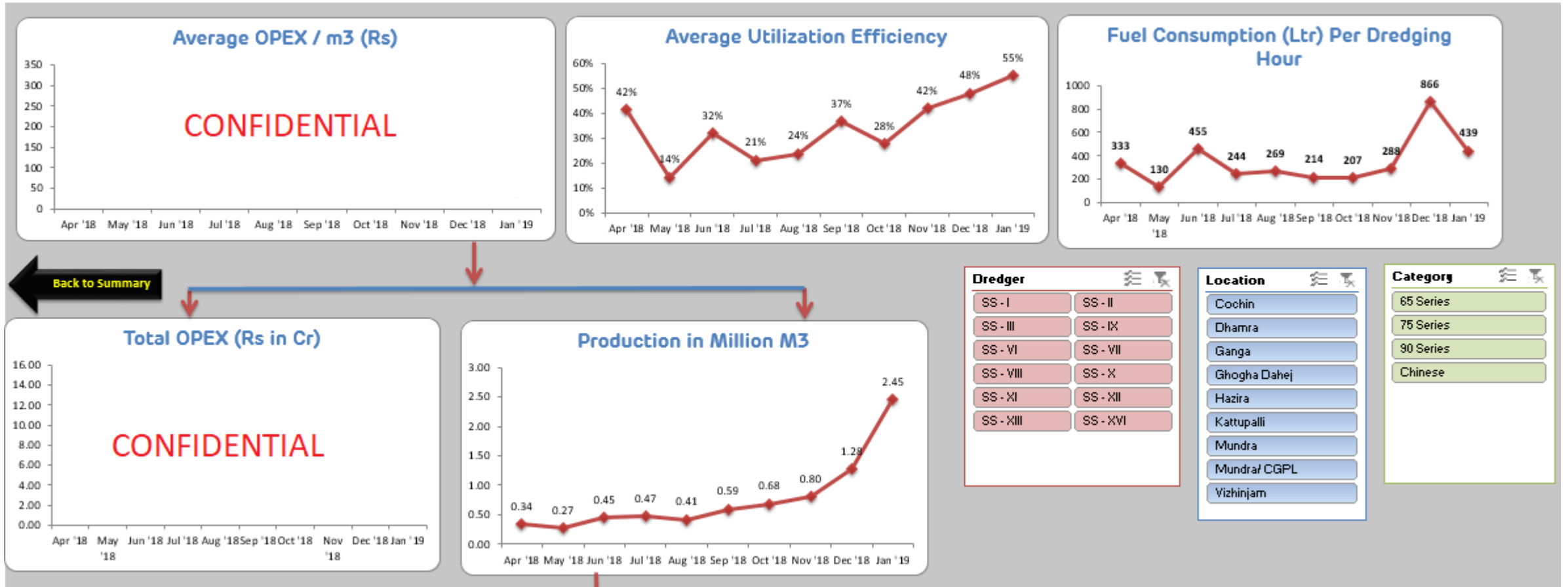


# Management Dashboards

- Reports available on One-Click
- Regular reports on operations data
- Choose from pre-defined parameters to generate reports
- Access from anywhere on Adani intranet
- Faster reports generation: savings of man-hours
- Analyse trends / Compare performance
- Visualize average vs Peak operational statistics
- Store reports on local drive for future reference



# Management Dashboards



# Digital Logbook

- Logbook is a application for capturing working information
- Integration with the PI System
- Real time information about equipment deployment and operator efficiency
- Provides details on dredger operations
- Records delays / stoppages in operations and reason thereof in real time
- Provide dredger-based operator-wise efficiency
- Elimination of manual entry by on board personnel
- People can focus on core operations instead of recording / keying in data
- Analyse reasons for delays / stoppages and improve thereupon
- Alerts and notifications provided for any abnormality in Operations and Equipment



Main Page – Operator login

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Level 2 delays

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Aquaterra Digital Logbook being used for Daily functioning

# AquaTerra – Salient features

Helps achieving Operational Excellence by monitoring and analyzing performance in real time

Provides historical and comparative statistics on dredgers performance

Allows operator and dredger performance

Integration of legacy systems onboard the dredger, Oracle and SAP

Allows for trend analysis, benchmarking and regression analysis

Provides a live feed to the Central Command Centre with real time alert notifications

Accessibility on hand held devices



# Use Case

## Business Challenges

- Disparate data sources scattered across multiple locations
- Real time fuel consumption data visibility
- Manual entries leading to unreliable data
- Equipment failure

## Solution

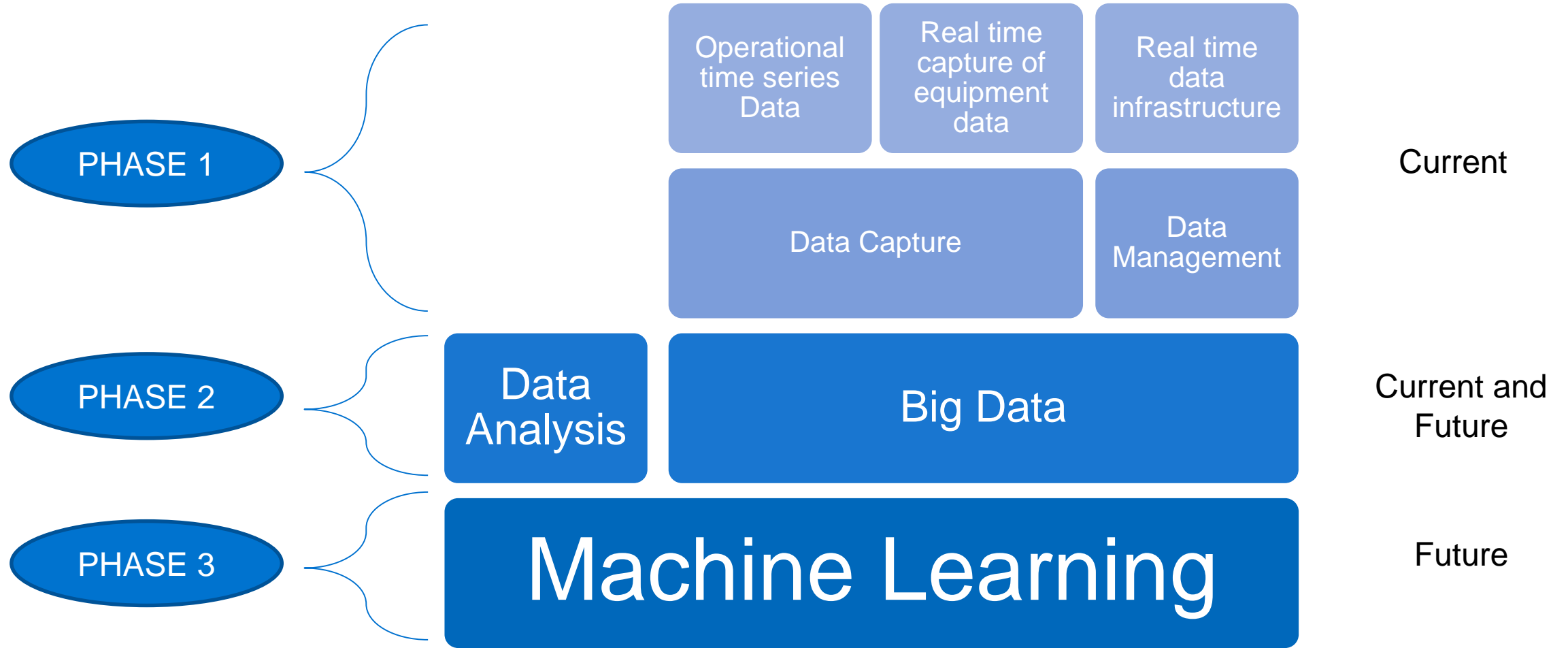
- Real time data infrastructure implementation through PI System by integrating legacy systems implemented on dredger and delay capture systems
- Single platform and user experience for remote monitoring of dredger operations from any location

## Benefit

- Single source of truth
- An easy-to-use system to monitor all assets, giving users clear indications on current operational dynamics
- Reduce fuel consumptions and improve operator efficiency
- Real time alerts based on user defined conditions

# Way Forward

# Aquaterra – Goal



# Extent of PI System in Adani Ports

- 5 ports: Mundra, Dhamra, Dahej, Hazira, Goa, Vishakapatnam
- Tugs : 20 +
- Dredgers : 10 +
- Adani LNG terminal - Mundra



Ports and Logistics



the growth catalyst

15 + Countries

500 + Projects

\$ 350 MN Saved by VCS Products



# Thank You

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謝謝

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TAPADH LEIBH

고맙습니다

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PAKKA PÉR

ありがとうございました

DI OU MÈSI

ĎAKUJEM

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