

# Leveraging IIOT for Engine Test-beds

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# What is Dynalec Controls?

Dynalec has been conventionally undertaking turnkey projects for the **design, manufacture and commissioning** of Engine Test-beds for Auto and Engine OEMs

Dynalec provides it's own (ISO-9001 Certified) Engine Test Facility **on-rent** for carrying out **endurance testing** of engines.



Fuel Conditioning System

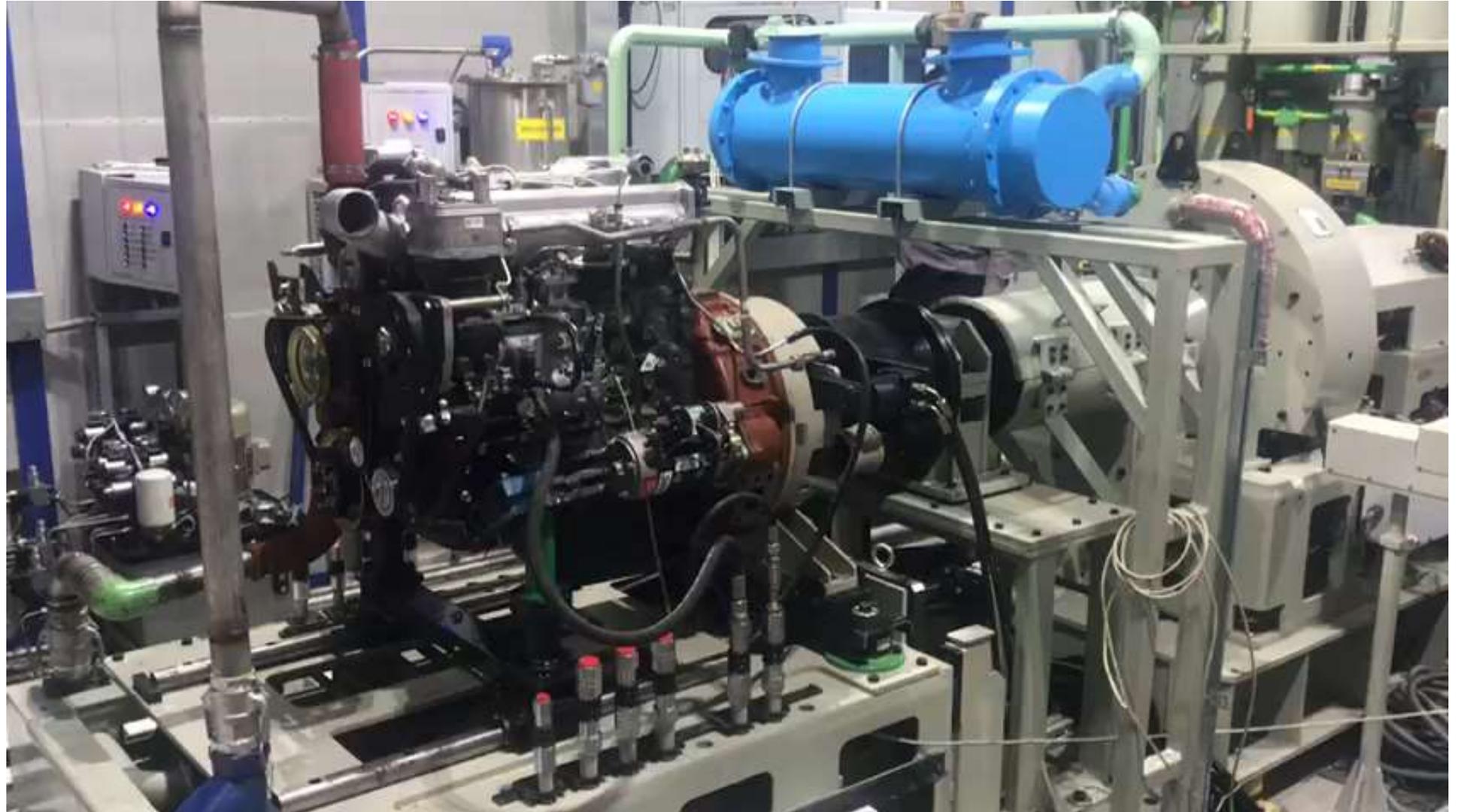


Coolant Conditioning System

Gravimetric Fuel Meter



# Dynalec Test-bed Engine Firing



Digitalization of Manufacturing through Industry 4.0

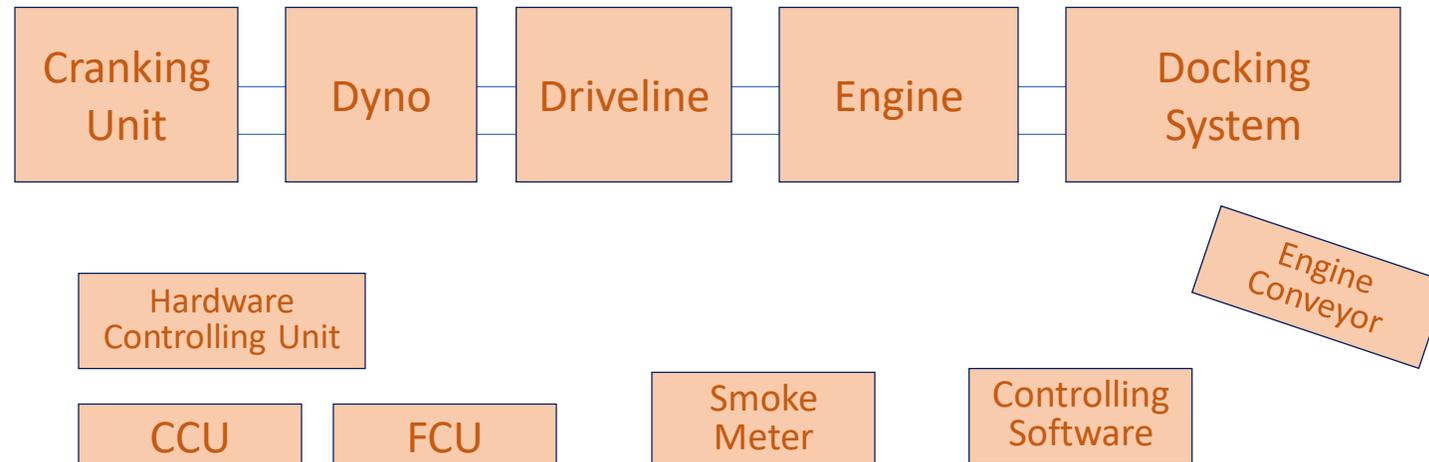
# Engine Data Acquisition and Control System



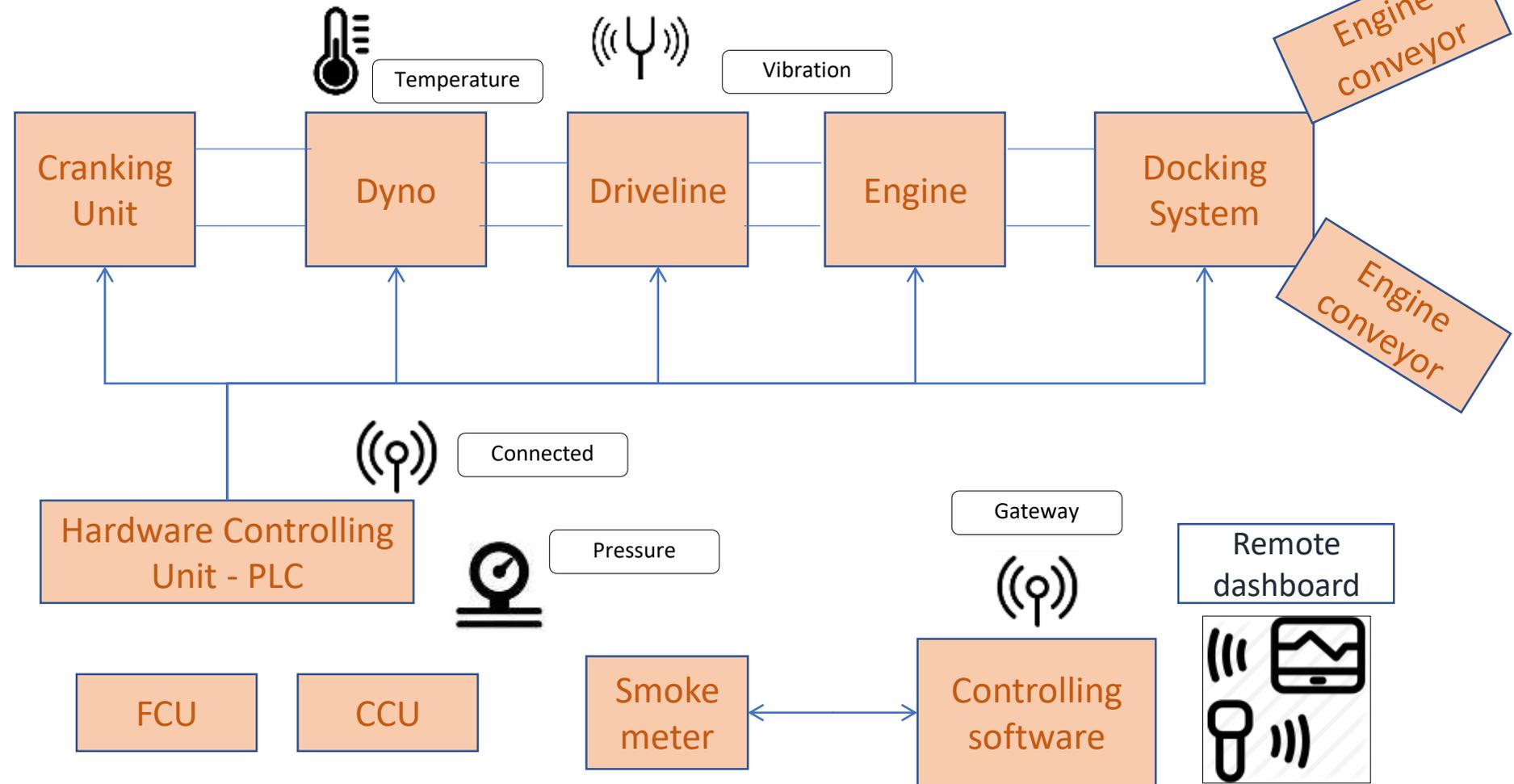
# Typical Engine Test Cell

## Sensors for Measurement of ...

- Temperature - Air, Water, Coolant, Fuel
- Pressure – Air, Water, Coolant, Fuel
- Flow – Coolant / Water / Fuel
- Torque
- Power – engine output
- Speed – Conveyor, Engine RPM,
- Volume / Mass – Fuel Consumption
- Vibration – Bearings, Pedestal, Engine, Driveline

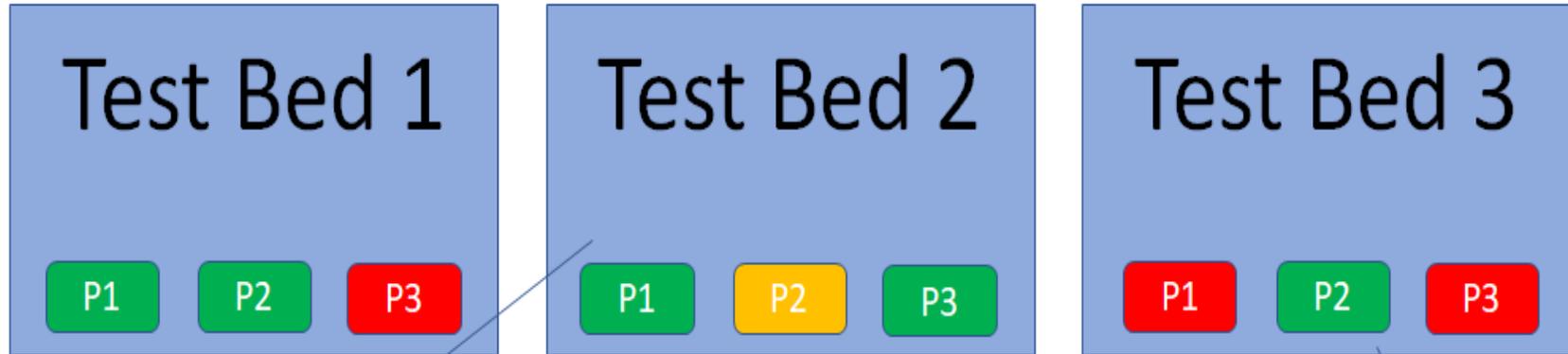


# IIOT Enabled SMART Test-bed

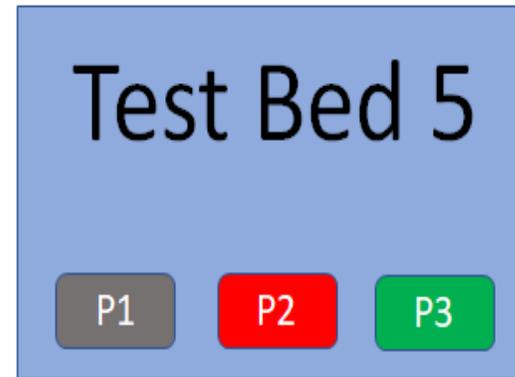
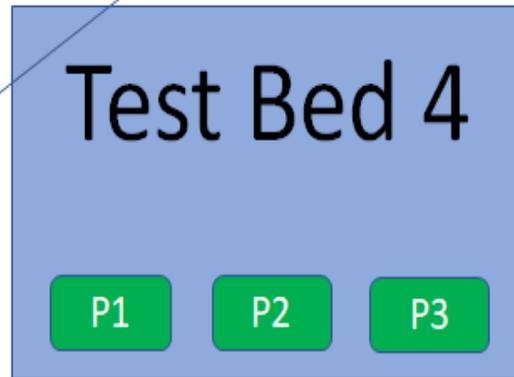


**Dynalec Test-bed is made SMART with IIOT Enablement**

Digitalization of Manufacturing through Industry 4.0



Live status of critical parameters:  
Green : Normal  
Yellow: Warning  
Red: Alarm  
Grey: Connectivity Lost



Clicking on Test Bed block will display detailed parameter view

**Test-bed Health Parameters at the finger-tip for the Customer**

# Business Metrics in Focus : Indicative

Mean Time to  
Failure

Mean Time to  
Repair

Number of  
Downtimes

Availability of Test-  
bed

Reliability of Test-  
bed

OEE (Overall  
Equipment  
Effectiveness) of  
Test-bed

Cost of  
Maintenance

Cost of Operations

Total Cost of  
Ownership

# Services Portfolio for Dynalec



**Maintenance**  
(Monitoring and Repairs) Support for the Test-bed



**Calibration**  
Support for the Test-bed equipment



**Operations Management**  
(Actual Running) of Test-bed



# Benefits to Customer

## Maintenance

- Reactive : On Demand / Failure
- Preventive : every month
- Predictive Monitoring : 24/7



## Calibration Support

- Planned : Every 6 months
- One Time : During Installation / On Demand

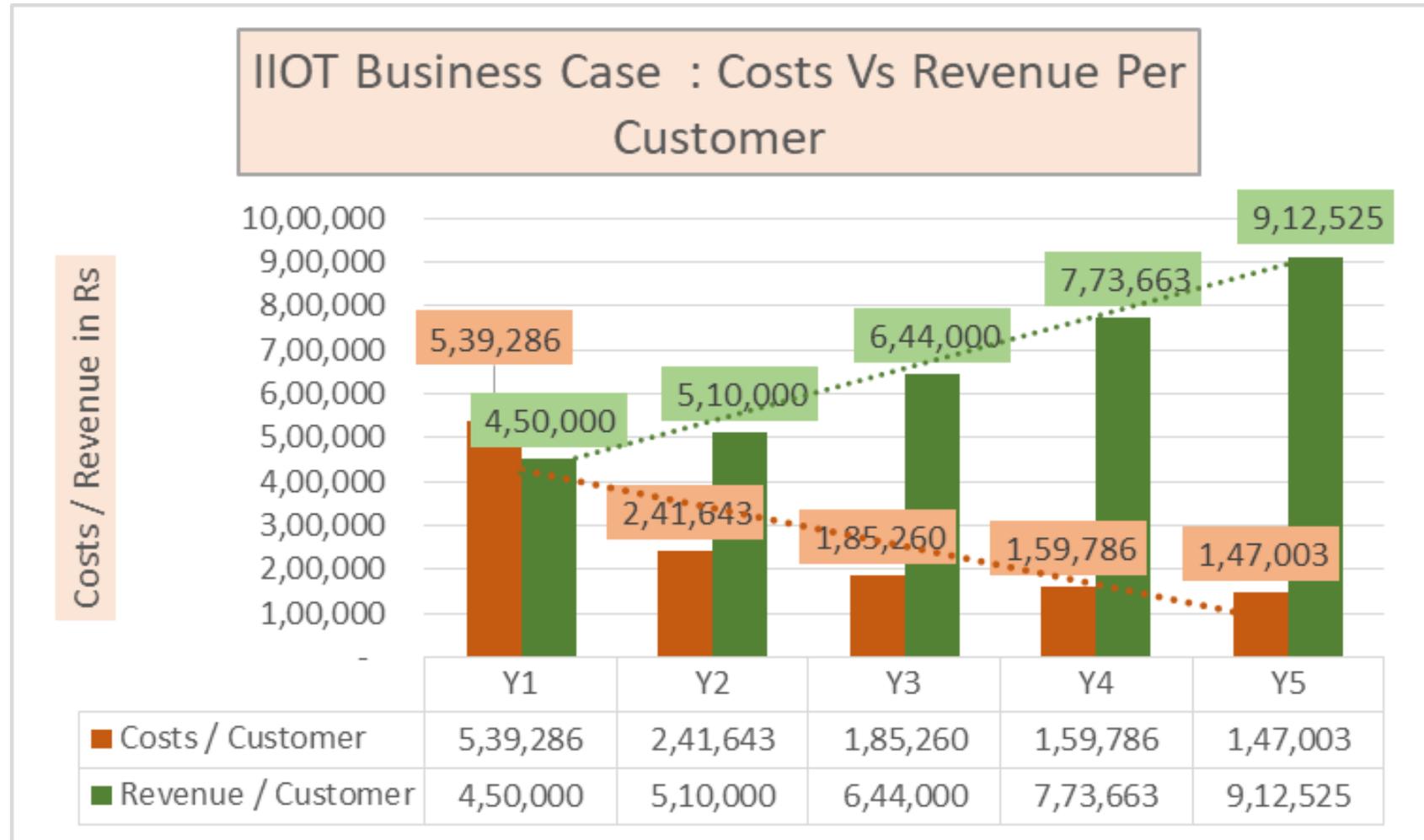


## Operations Management

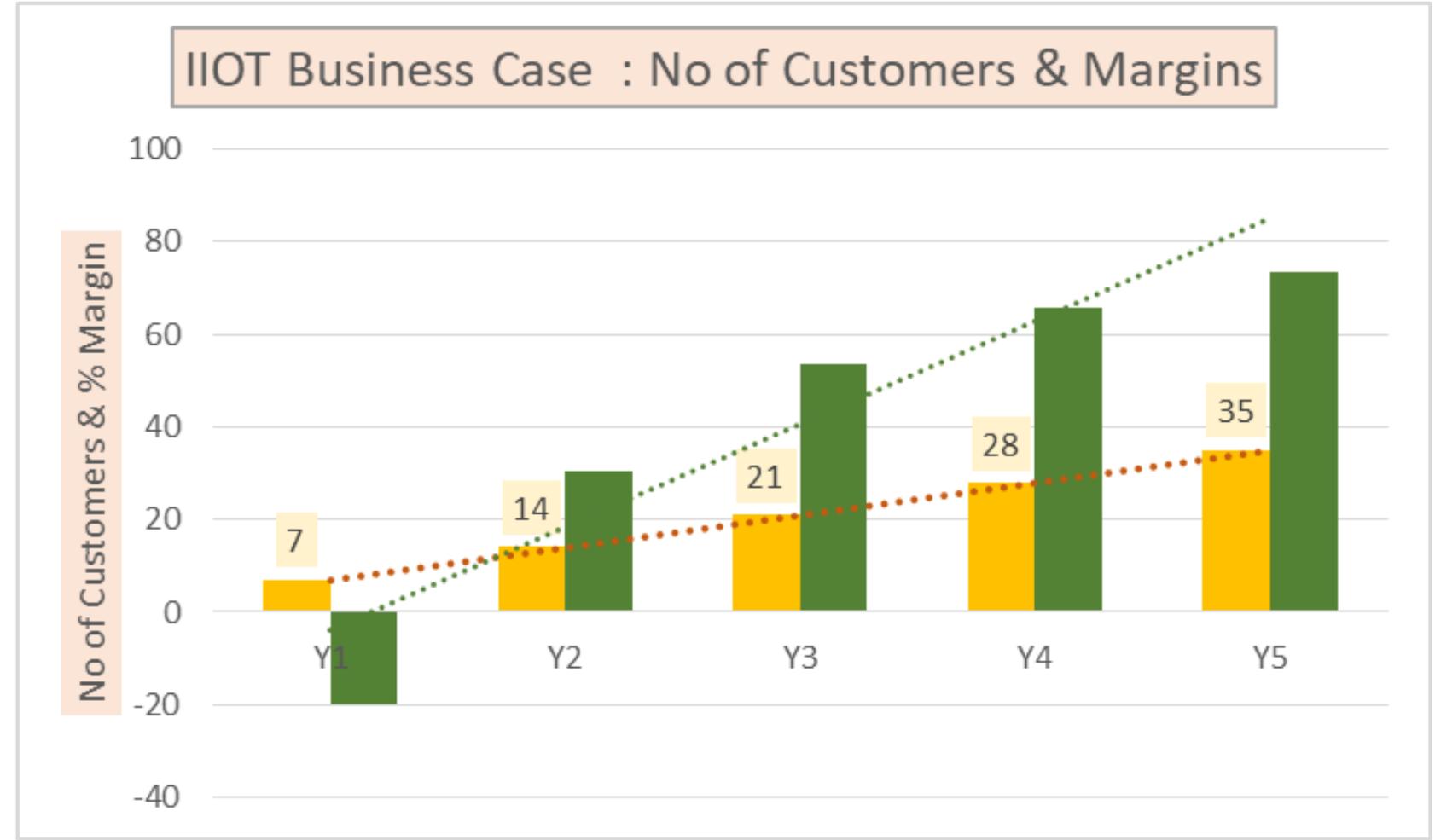
- Involvement Based
  - Engine Rigging and Docking
  - Engine Testing & Report Generation
  - Engine Go-NoGo
- Per Day / Shift Charges, Lean Period Charges,



# IIoT :: Return on Investment



# IIOT :: Return on Investment



# IIOT Enablement : Critical Success Factors

Support by  
IIOT  
Technology  
Partner



**Joint Success  
for IIOT  
Initiative**

**Customer**

Platform for SME

Scalable Platform Model

Data Aggregation

Data Upload to Cloud

Data Analytics / Insights

Predictive Models

Customer Connect

Domain Expertise

Test Facility / Sensors

Data Acquisition

Business Intent

Top Management  
Commitment

Valid Strong Business Use-  
case

Realistic Business Case

Availability of Resources

Adherence to Timelines

Access to the Test-beds

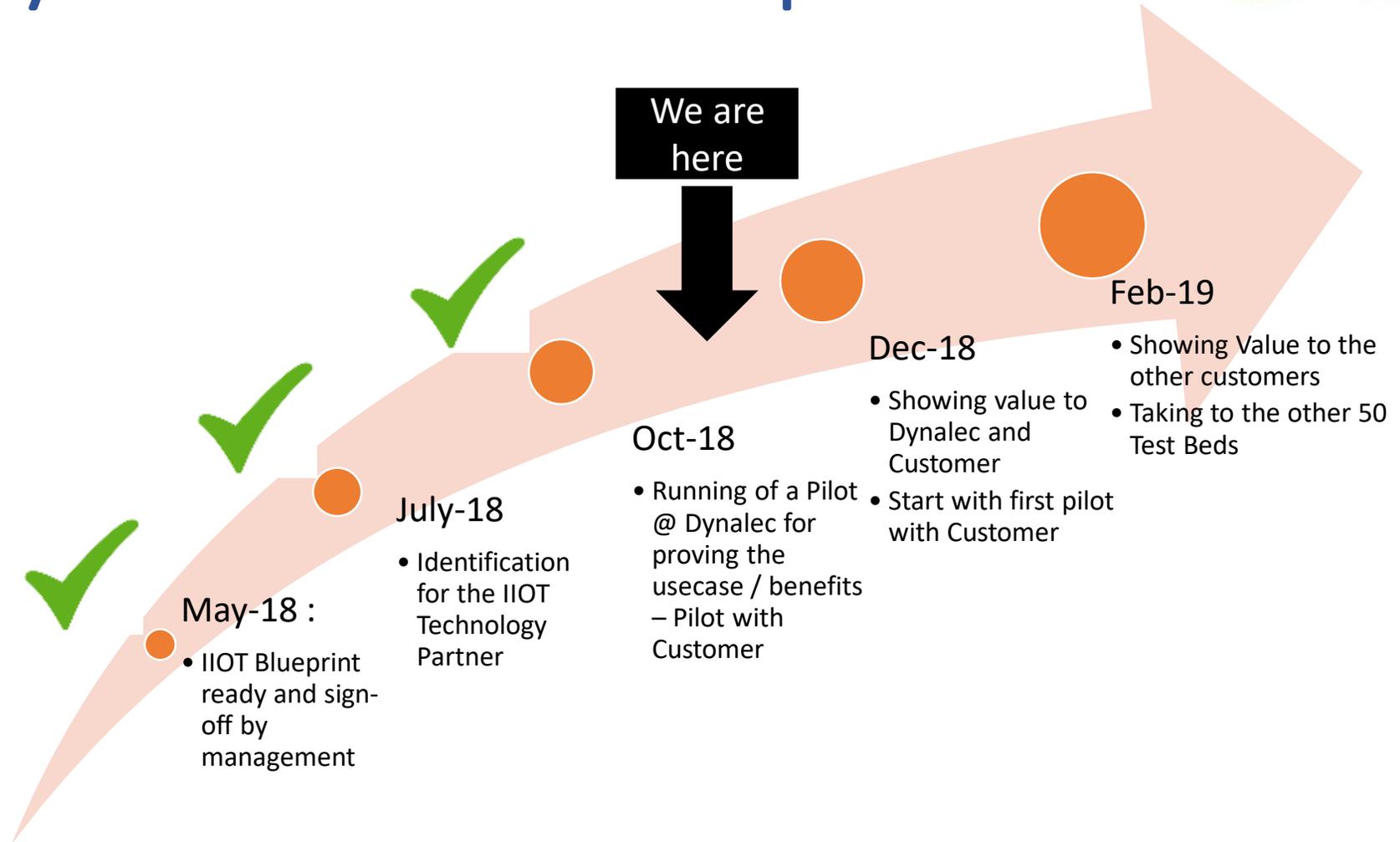
Security Approvals

Bandwidth Availability

Business Centric Use-case

Insights Required

# Dynalec IIOT Roadmap



**Proven Value Add -> Pilot -> Market Offering**

Remote Monitoring

Condition Based Monitoring

Sensor Data on Cloud

Triggers and Thresholds

Analytics -> Insights -> Patterns / Trends

Failure Model Effects and Analysis (FMEA)

Early prediction of any abnormality / failure

Lesser Production Stoppages

**Increased Reliability** and possibility of **de-risking the operations** within the Test-bed Operations



## Customer

- Low Upfront Investment
- Pay as You Use Charges
- Outsourcing of Operational Risks
- Guaranteed RoI Model
- Easier Approvals



## Dynalect

- Higher Risk Appetite
- License Sale to Services Sale ("Engine Test" as a Service)
- Higher Quality and Services Level
- Annuity & Assured Revenue - @ 30%
- Value Add to the customer
- Differentiator in Market

# Changed Value Proposition with IIoT

Dynalect takes care of the design, development, installation, commissioning, **maintenance, running, monitoring and control** of the engine test beds for their customers

Dynalect helps customer **reduce their maintenance, breakdown and operations costs** of the test beds and **protects** the customer **from financial and operational risks ..**

# Existing Dynalec Customers for Smart Test-beds



DELPHI-TVS



SINCE 1859



**Mar-19**

- Start Data Mining for insights from the Test Data of Engine in an anonymous format

**May-19**

- Showcase value add in the form of insights to the Engine Manufacturers

# Dynalec at a Glance : IIOT Roadmap

## Dynalec will help the customers to

Get an insight of how the test-beds are performing remotely

Provide an ability to prevent and predict any potential failure for their Test-beds and Engines

Reduce downtime and any potential safety incidences

**Ready to shake hands for the alignment of the IIOT Roadmap**

## Other Strategic Initiatives @ Dynalec

- Making IIOT Remote Monitoring as a standard offering for Dynalec
- Adding new logos as Customers
  - Domestic and Overseas
  - both Auto / Defence and Engine OEMs
- Getting Registered as R&D Unit
- Growing focus on Test-beds on lease model
- Expanding product-line
  - Testing of Electric Vehicles
  - Hydraulic Dynamometer
  - Testing of Driveline / Transmission / Gearbox
  - Cold Testing of Engines and Transmission
  - Regenerative Dynamometer

*Looking forward to be associated with  
you and to add value to you ...*

thank  
you

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