

**DATA+AI**  
SUMMIT 2022

# Manufacturing Process Optimization

Cloud to Edge AI Driven  
Solutions

ORGANIZED BY  databricks



**Vamsi Krishna Bhupasamudram**  
Director, Tredence Inc

# Tredence: AI-led Solutions Delivering Last Mile Impact

- 1700+** 1700+ data scientists and data engineers from top universities, certified in cutting edge data & AI technologies
- 50%** Accelerator led solutions that improve time to value by +50% vs. traditional consulting and technology service companies
- 94%** Best in class 94% NPS customer satisfaction score driven by our laser focus on empowering decisions to help our clients win



One of the world's fastest growing and most awarded management consulting and technology companies



"Leader" in customer analytics



Market guide for data analytics & intelligence platforms in supply chain



Certified as Great Place to Work by GPTW



Fastest growing US companies 6 years in a row



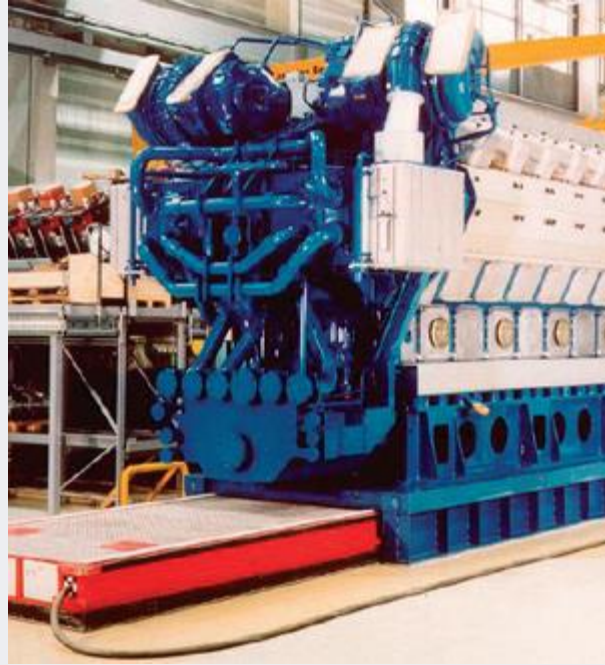
*Servicing industry leading clients across verticals from 14 offices across North America, Europe & India*

# Context

# Let's look at some use cases driving the future of operations...



Growing customer demands and quality requirements



Complexity of equipment & processes



Increased focus on reducing energy footprint

## What does this mean for operations teams?

# The case for 'real time industrial AI inside plants'



Need to enable low latency predictions to help time critical decisions on site

Un-reliable networks at sites, apart from security concerns

Improved intelligent automation of operations

**Leverage the possibilities to deploy AI solutions to on-site "edge" compute devices**

# What's the way forward to implement these solutions?

## Key implementation Challenges

**Lack of AI & edge infra orchestration skills**

**Difficulty in deploying AI models and services to operational sites**

**Difficulty in collaboration between teams**

## Needs solutions that can enable...



High accuracy ML model development



Seamless model deployment & orchestration



Real-time visibility into operational performance of the model

## ...Through C<->E<->C Solutions



Built for Edge, automated AI solutions

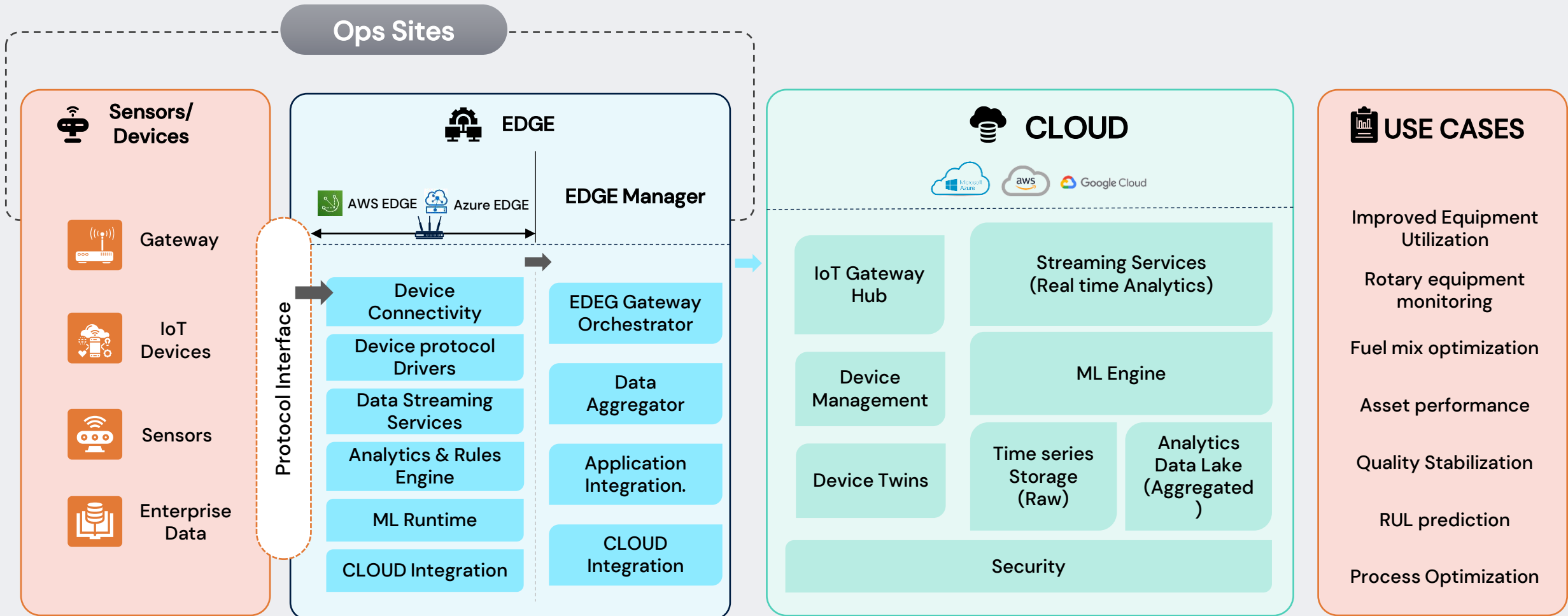


Integrated approach to enable seamless deployment across sites

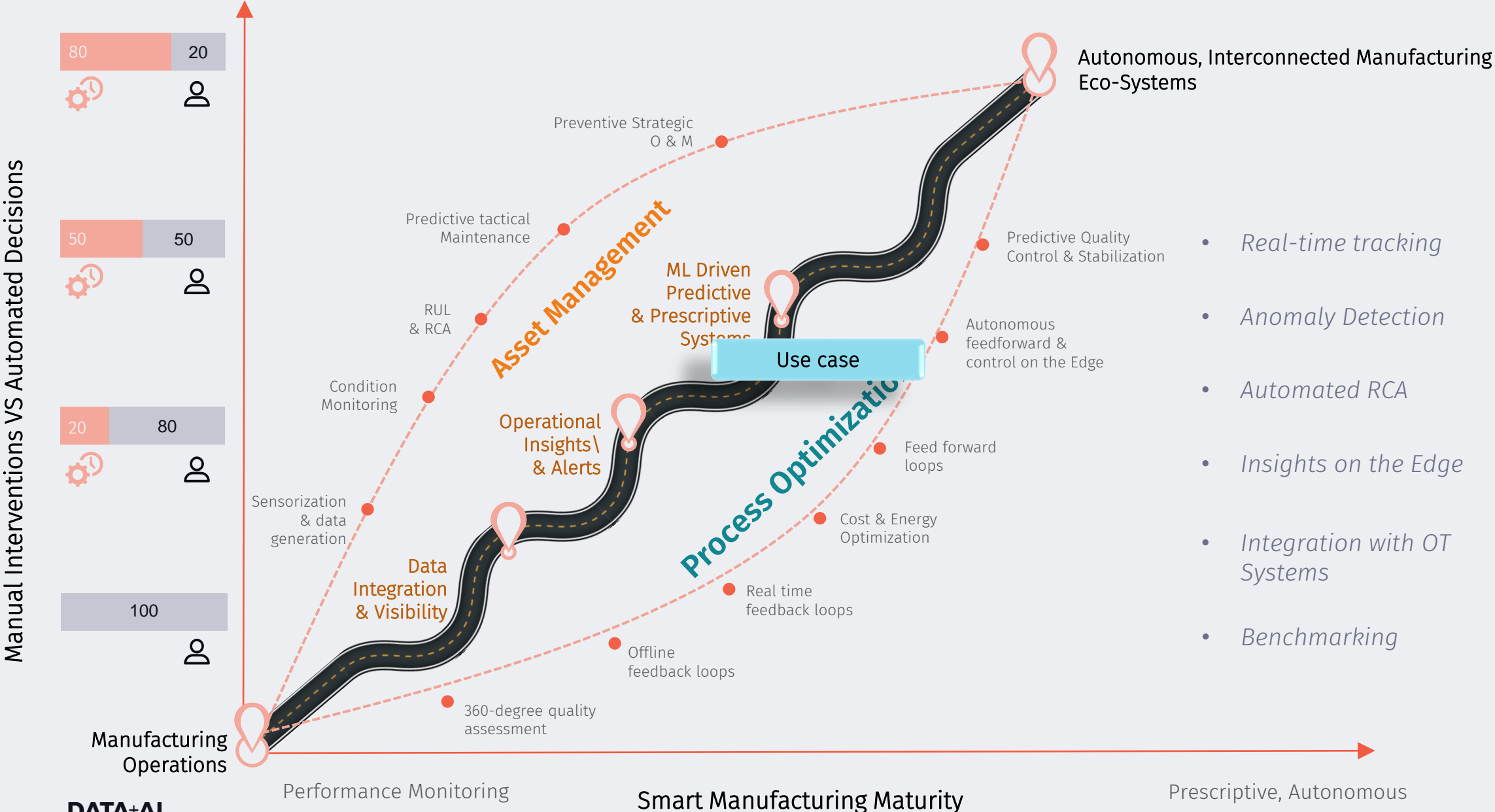


Monitoring and orchestration of edge devices and their resources

# Reference Architecture for typical solutions



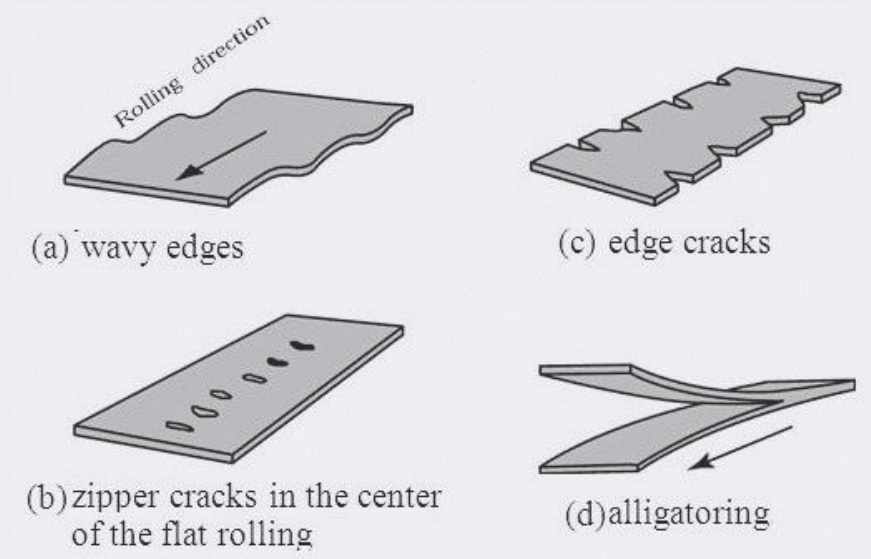
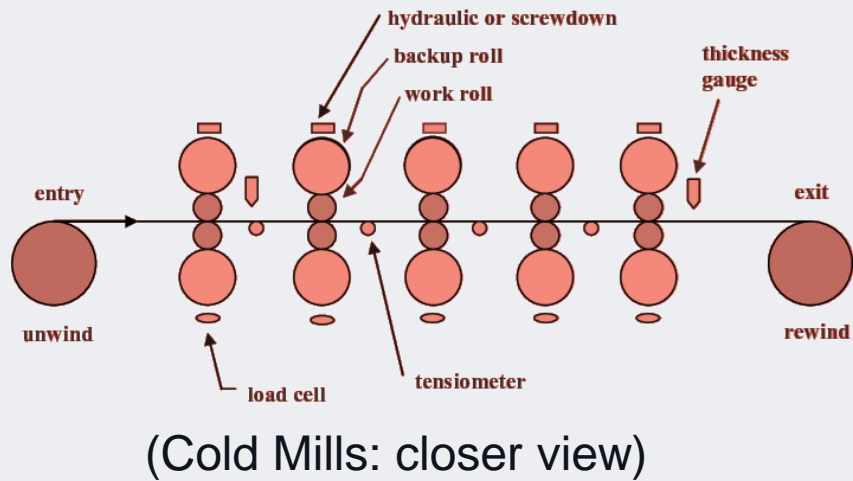
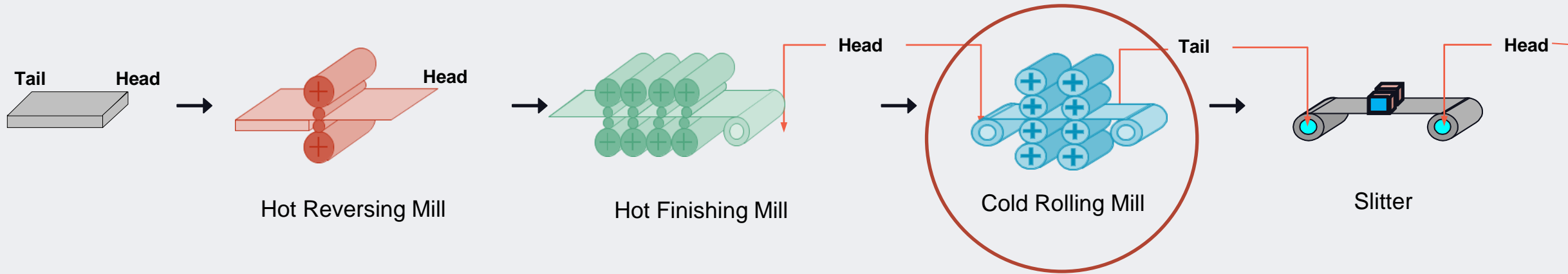
# Smart Manufacturing Journey – Varying maturity levels





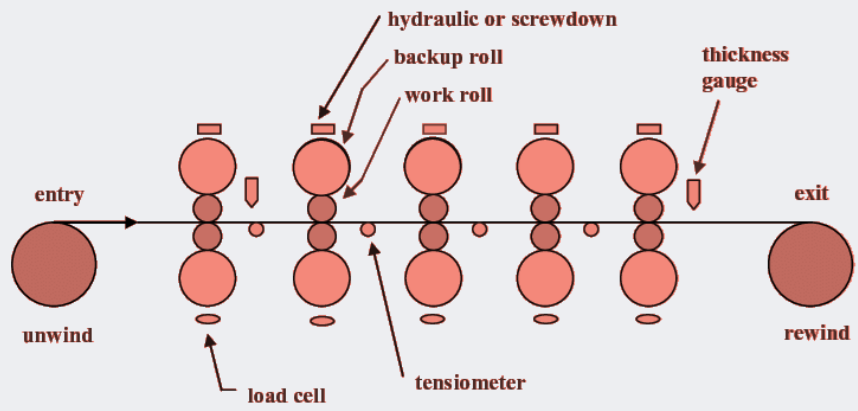
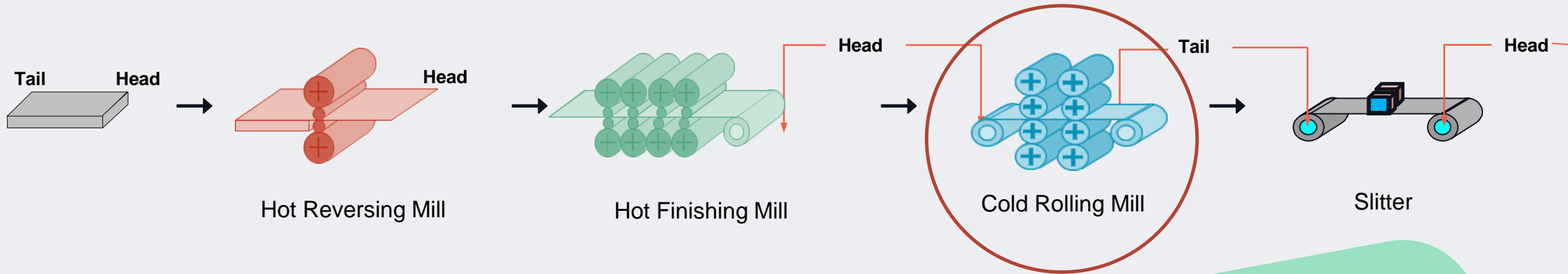
# Use Case Illustration

# Manufacturing Process Set-up: Metal Rolling Mills



Sample rolling mill related defects in cold rolling mill

# Manufacturing Process Set-up: Metal Rolling Mills



(Cold Mills: closer view)

Rolling direction

(a) wavy edges

(b) zipper cracks in the center of the flat rolling

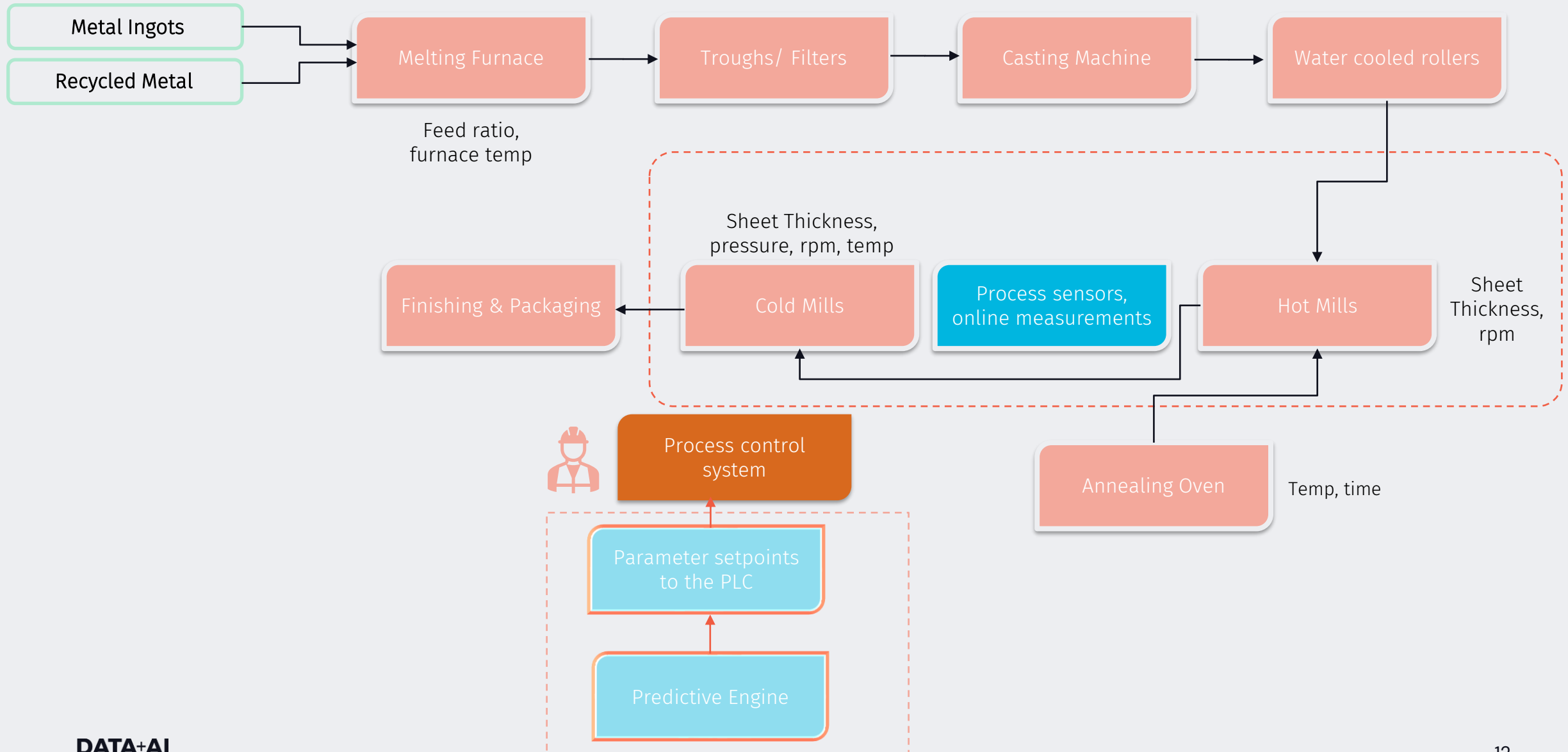
(c) edge cracks

(d) alligatoring

**Key driver of these defects: The final cold rolling mill process is not optimized fully to account for the machine condition and upstream WIP product profile**

Sample rolling mill related defects in cold rolling mill

# This problem needs a solution that works on the shopfloor



# Learning and Takeaways

# Potential Operational Impact of Cloud-Edge AI Solutions



**20–25%**  
reduction in  
stoppages & down  
time



**Up to 40%**  
improvement in  
QC and QA  
performance



**~ 10%**  
reduction in  
carbon footprint

# Planning, Co-creation & Change management

## Month 0 – 1

Ideation and use case discovery

**Use case selection** from different ideas  
**KPIs:** Quality variability, downtimes, CO2 emissions

## Month 1-2

Plant and digital champions

**Data availability,** level of **automation** & readiness

## Month 2-4

Pilot solution development, roll out and monitoring

**Varied insights integration,** from weekly guidance sessions, to PLC integration  
**Monitored KPIs:** identified in step 1

## Month 4-12

Roll out to next batch of plants

Solution **Automation & Integration** with plant systems

## Month 12-24

Full network roll out

Staggered **scale out across plants**



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**Thank you**



**Vamsi Krishna Bhupasamudram**  
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**AI | Edge | Digital Twins**

**Manufacturing | Supply Chain | Operations | Sustainability**