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Digital Twins for

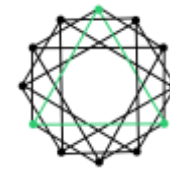
Manufacturing Intelligence

Outline

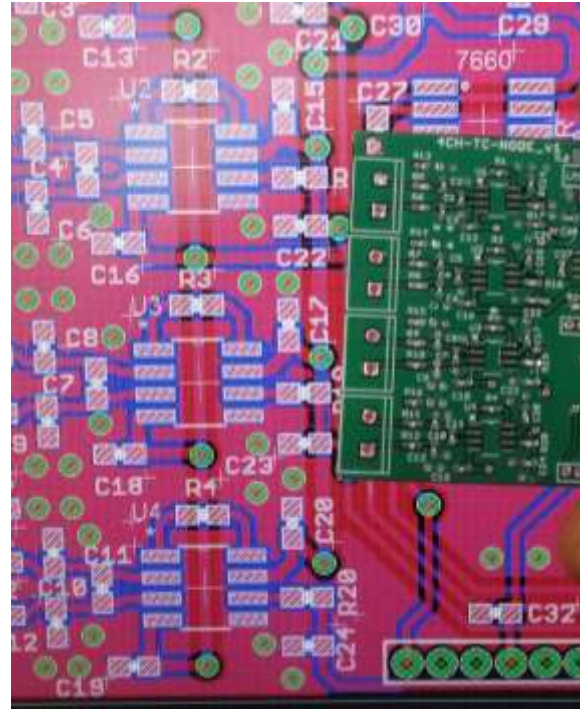


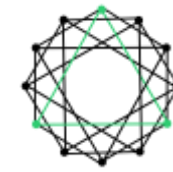
1. About Me and SwitchOn
- 2. Industry 4.0 – IIOT- Edge – Our Vision**
3. Why edge ? experiences
4. SwitchOn –Product Layers
5. Edge Advantage Case 1 - Predicative Maintenance
6. Edge Advantage Case 3 – Quality Checks
7. Cloud dead.. ? Hybrid Architecture
8. Q&A

About Me



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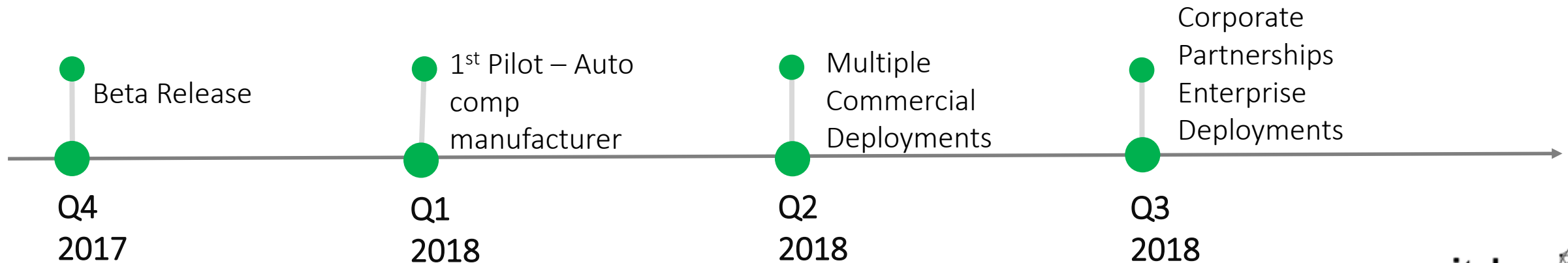
Automotive Manufacturing Customers



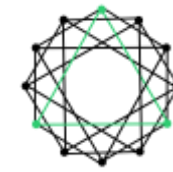
Discrete Manufacturing Customers



International Customers



Industry 4.0 – New “EDGE” Factories



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Industry 1.0

Mechanization and the introduction of steam and water power



Industry 2.0

Mass production assembly lines using electrical power



Industry 3.0

Automated production, computers, IT-systems and robotics



Industry 4.0

The Smart Factory. Autonomous systems, IoT, machine learning

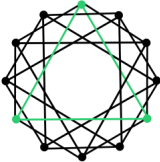
The transition from IIOT to Edge AI in 4.0

Why Edge ?



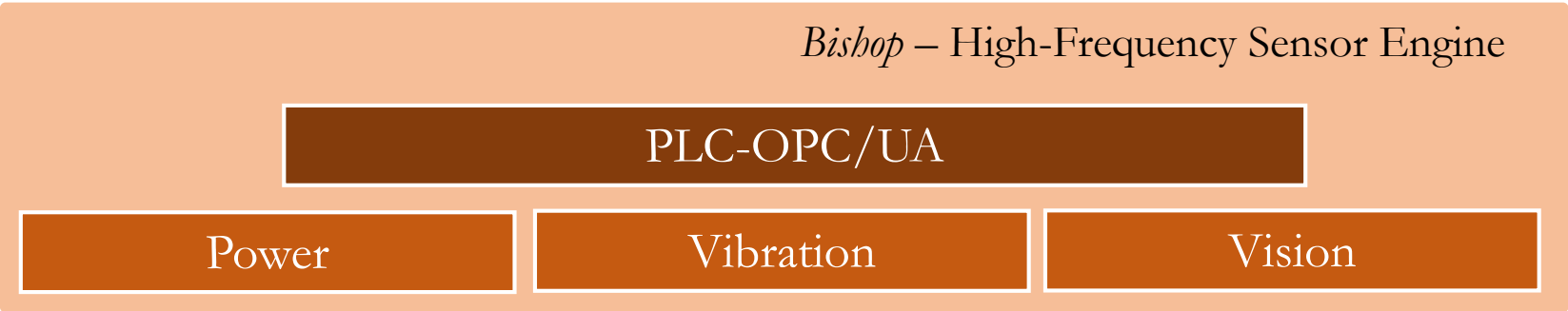
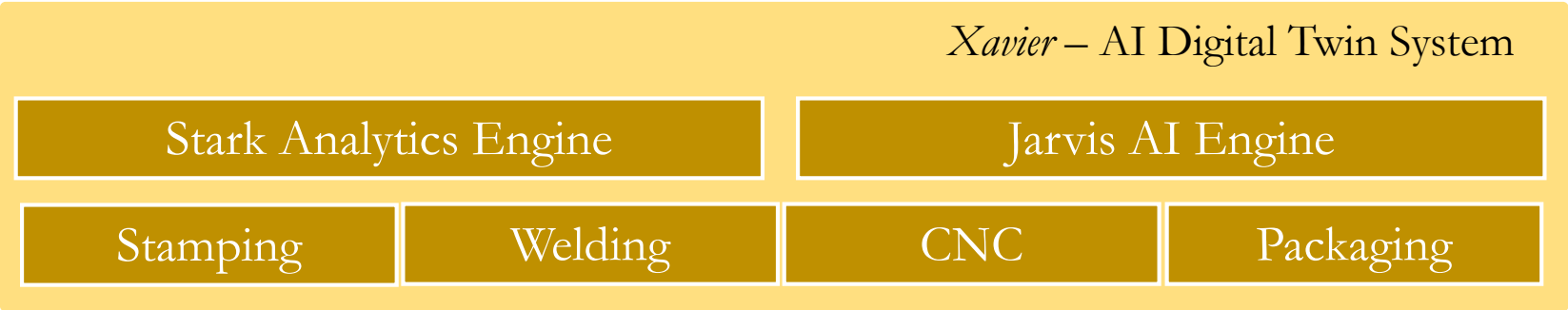
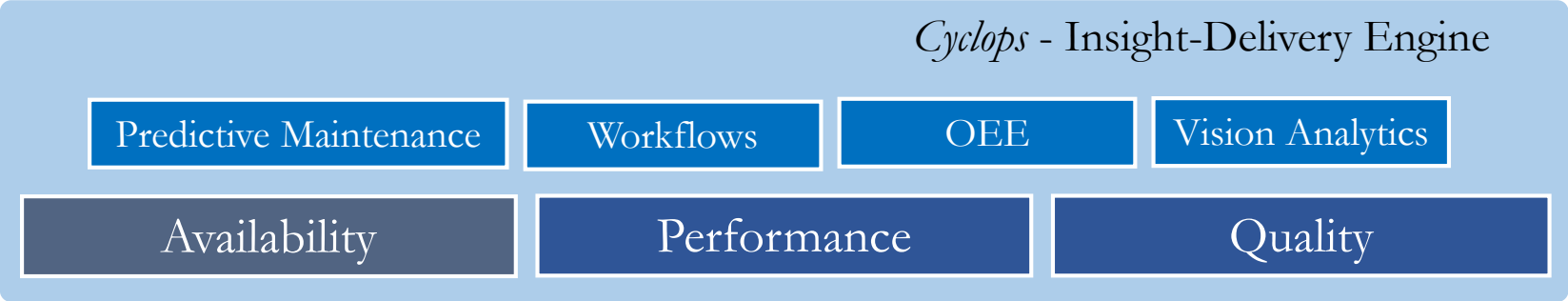
1. Machines are Real- Time systems ie. They cant wait for your server to restart
2. 100% Network Uptime is a myth
3. Data is cheap, when you start stream 100 GBs a day suddenly....
4. Manufacturing push OPEX pricing models

Our Product

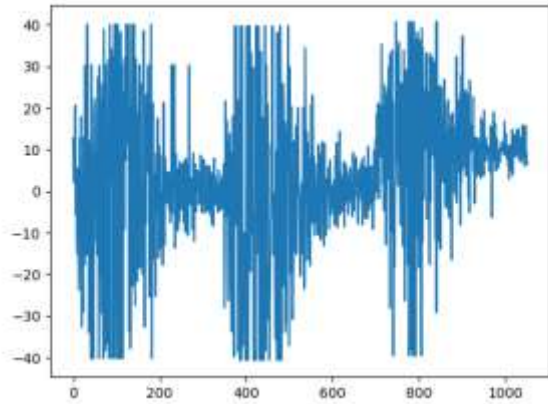


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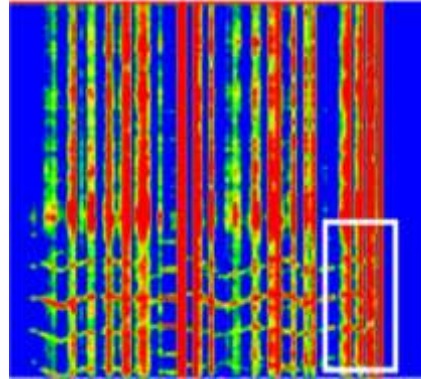
Friday – Visualization/API Engine



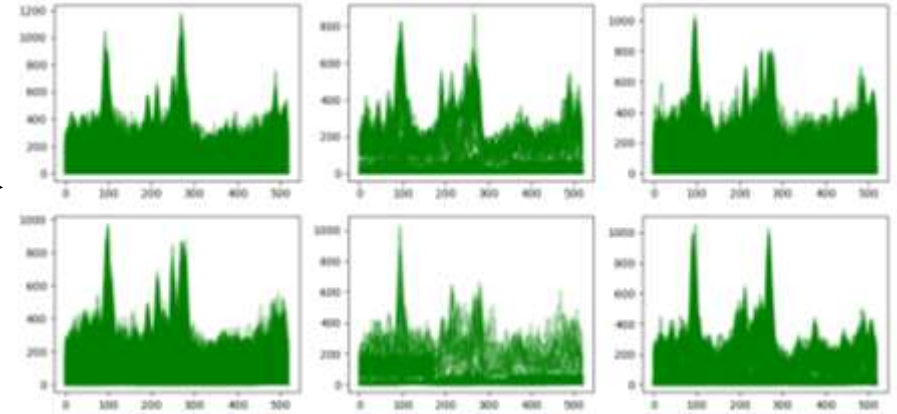
Edge Advantage - Predictive Maintenance



Granular High Frequency Data



Anomaly Detection



State Prediction

3 Axis Vibration Signals
20kB per Second
1.6 Gb per day generated

- **Just one data Stream**
- **50 Gb per Factory/Day**

Acquire ... Process .. Generate Insight.. Send Insight
Complex Machine Changes states every seconds

Edge Advantage:
Continuous Uptime
Latency
Saved cost for Customer and SwitchOn

Edge Advantage – Quality Prediction

300 Parts per Min = **200 ms** between 2 products

FMCG machine rates 250 – 1200 ppm

LATENCY

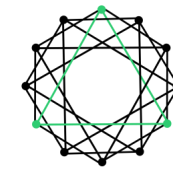


Acquire
Image filtering augmentation
Image Processing
Inferencing
Storage



2000 X 2000 X 3ch X 8bit = 11MB Raw .. Compress .. Resize 10X ..
1MB...500ms@ 2MBps.. Cloud is broken for real time systems

Cloud dead.. ? Hybrid Architectures



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Edge Device

Edge Device

Edge Device



Edge Device

Signal Processing

Data Storage

Inferencing

Stream Analytics

Re-Training



Training Workloads

Device Management

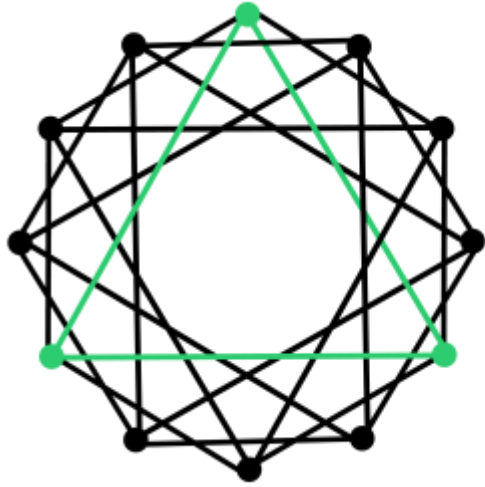
Multi Location

Data Management

OTA

BI/Dashboarding

Cloud



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Thank You

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