SMART MANUFACTURING

Identifying the disruptions/disruptors

3 Sections

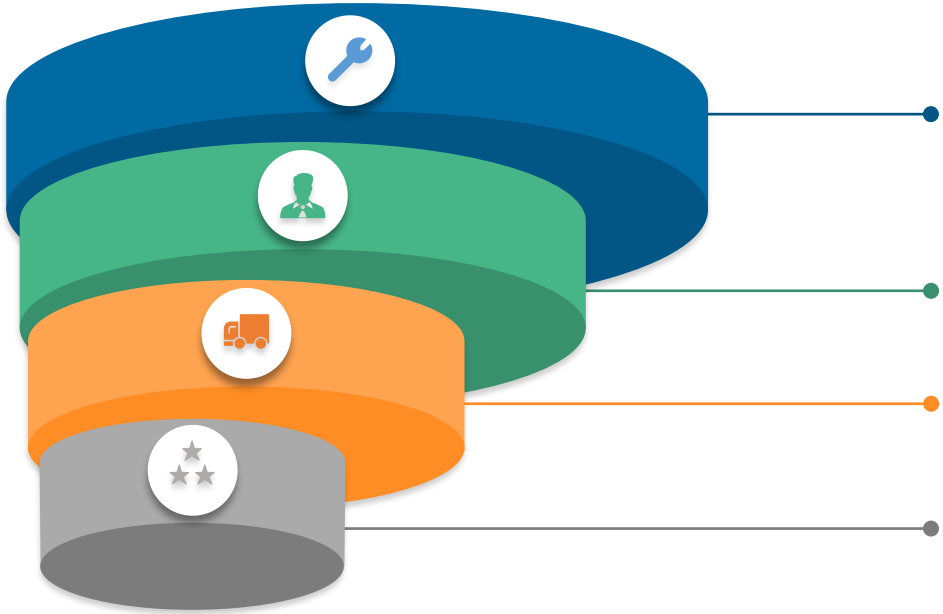
1. Digital Transformation Market Analysis
2. Smart Manufacturing Technology Stack
3. Industry 3.0 to 4.0 Projects and disruptions

MohanPrabhu Selvaraj, MS-IoT, INSA [Intern]

SECTION-1
DX MARKET ANALYSIS

Verticals, Top Spenders, Market size
COVID Impact
Industry trends
Technology trends

Digital Transformation – Top Spenders in 2019



Manufacturing

Discrete & Process Smart manufacturing

- Digitalize & Optimize factory operations (Vertical integration)
  - *Robotic Manufacturing| Autonomic Operations*
  - *Asset instrumentation | Root cause Self-healing assets*
  - Production Asset Management
- Digitalize & Optimize Supply chain (Horizontal integration)

Transportation

Digitalize Mobility experience

Digitalize Supply chain

- freight management and intelligent scheduling.

Retail

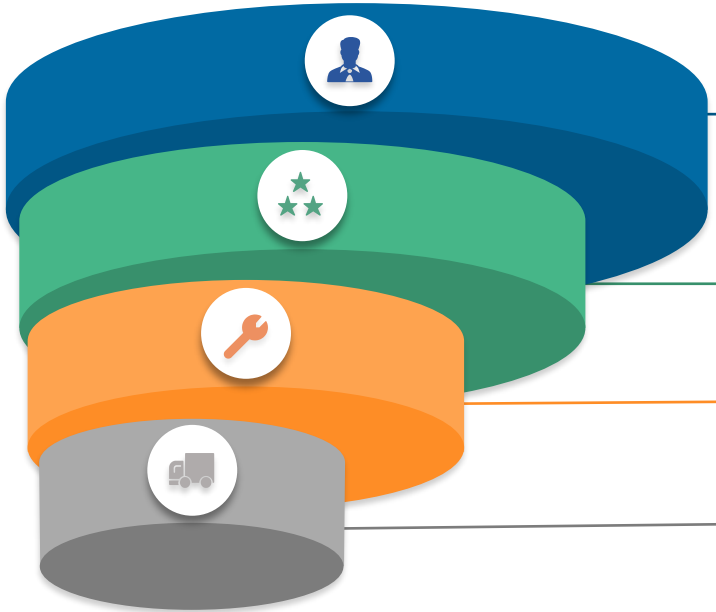
- Omni-channel commerce platforms
- augmented virtual experience
- in-store contextualized marketing
- next-generation payments.

Utilities

- intelligent and predictive grid management for Electricity/Gas/Water

Enterprise Technology Spending – **COVID-19 impact**

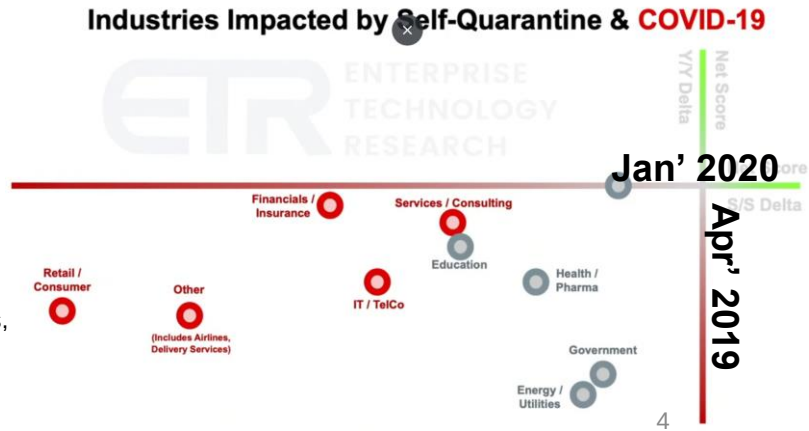
Spending intensity survey with CIO's – data collected in Apr'2020 | 400 vendors



Intentions to spend $ in 2020
(vs)
Actual spending in 2019

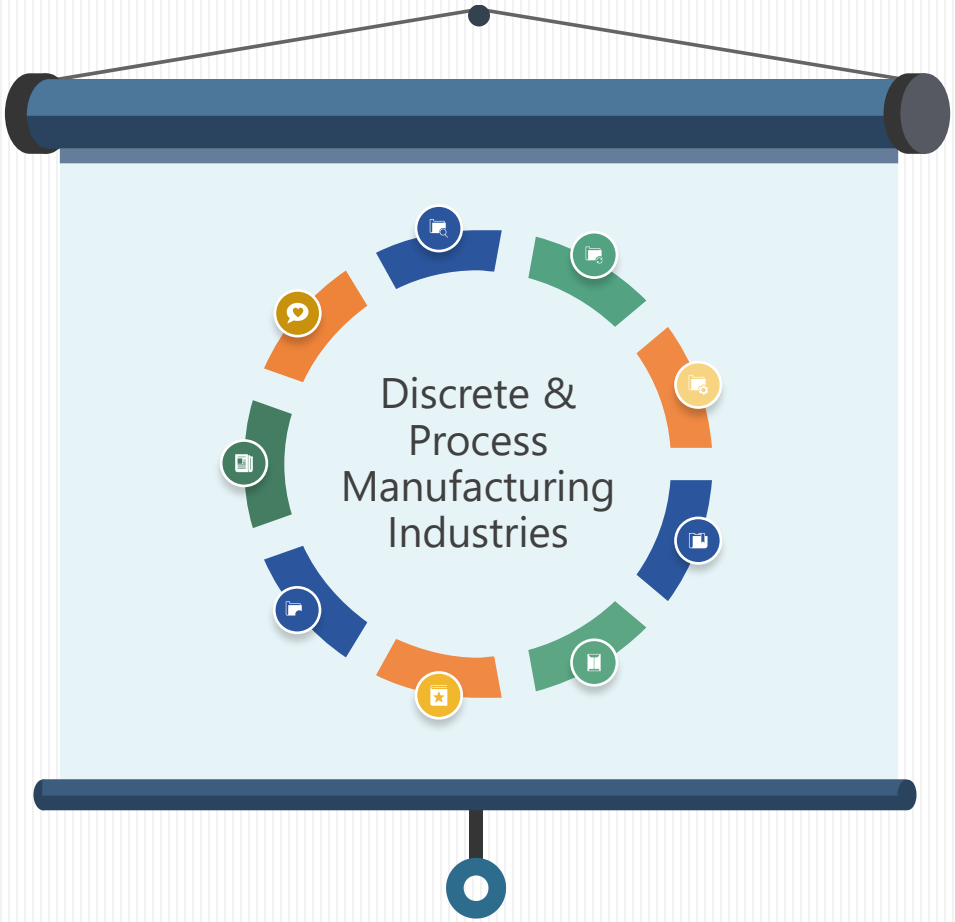
Survey posted in Jan' 2020
Updates received in Apr' 2020
How much changed in last 3 months?

X-axis: current spend intensity **(vs)** 3 months ago
Y-axis: current spend intensity **(vs)** an year ago



Spending intentions Pull-back – LOW
Government, Utilities/Energy, Health/Pharma Education

Spending intentions Pull-back – HIGH
Retail/Consumer, Airlines, Delivery services, IT/Telco, Financials, Insurance, Services, Consulting



01 Airbus, Boeing, Rolls-Royce, Rafale, Dassault, Lockheed-Martin - **Aerospace & Defense**

02 **Automotive** – BMW, Volkswagen, Toyota, Renault

03 **Chemicals**

04 **Metals**

05 **Pulp & Paper**

06 **CPG –** Nestle, Procter & Gamble

07 Qualcomm, ARM, FreeScale - **Hi-Tech Electronics Components**

08 **Hi-Tech Electronics Equipment –** Apple, Samsung, NOKIA, CISCO, Ericsson

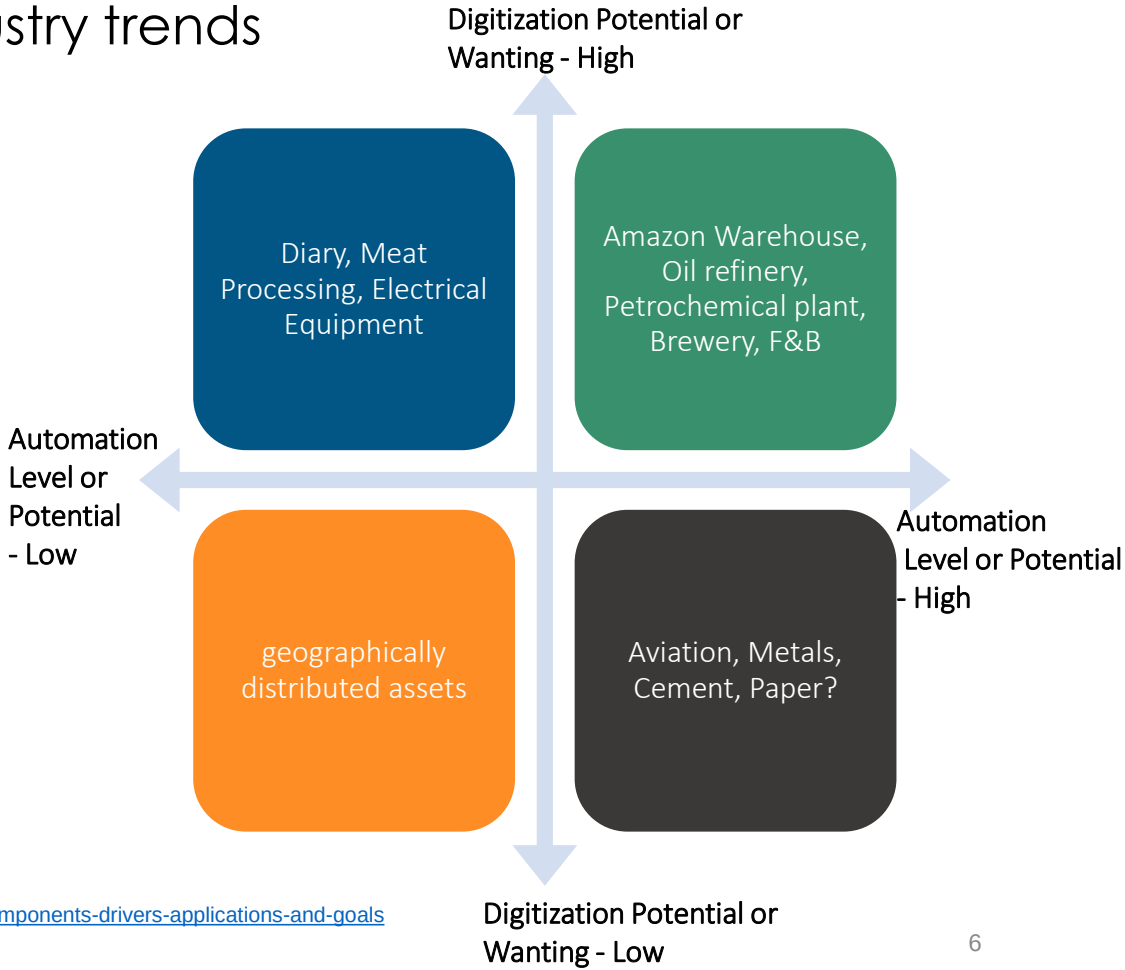
09 **Hi-Tech: Others, Discrete Others, Process Others**

Smart Manufacturing - Industry trends

Connectivity driven Remote monitoring

Digitization, Machine Learning & Automation (Small/Medium scale)

Digitization, Machine Learning & Automation (Large scale)



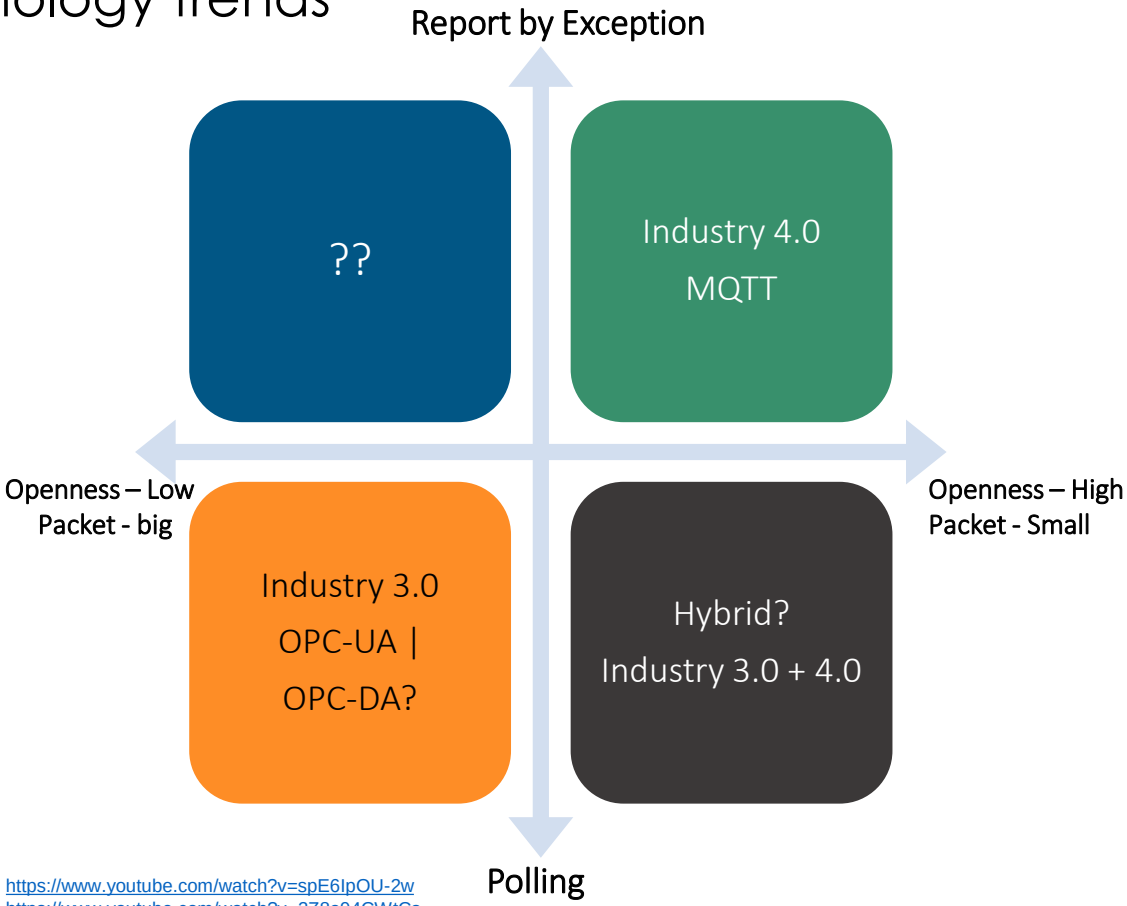
https://hapticmedia.fr/blog/en/industry-4.0/#understanding-industry-4-0-components-drivers-applications-and-goals

Smart Manufacturing Technology trends

Industry 4.0
MQTT

I4.0 + I3.0 Hybrid

Industry 3.0
OPC-UA

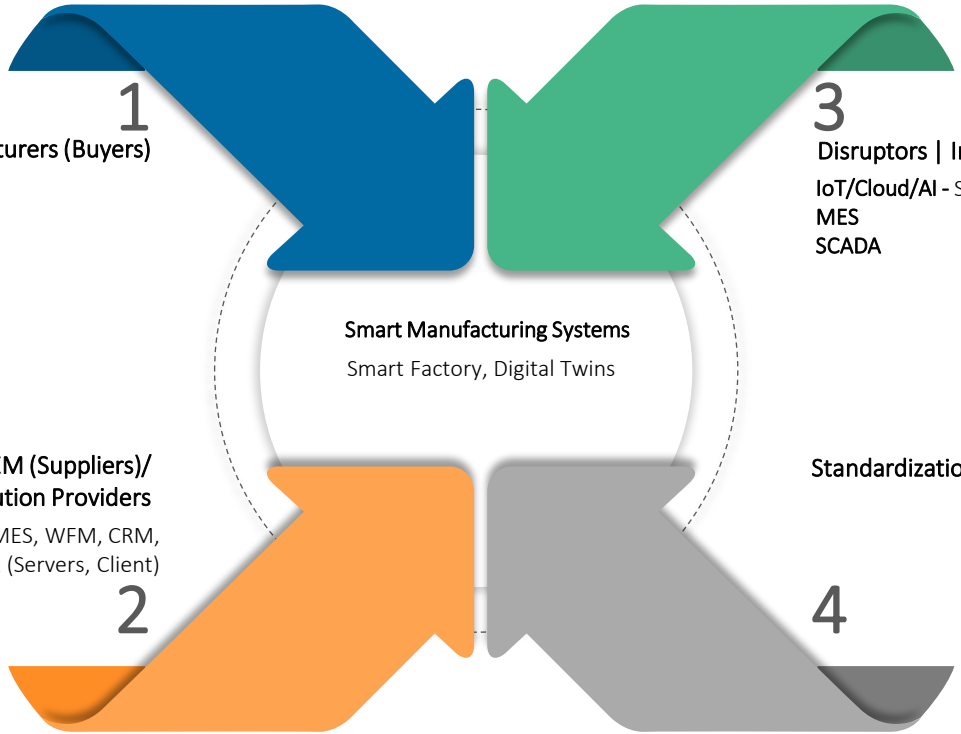


https://www.youtube.com/watch?v=spE6IpOU-2w
https://www.youtube.com/watch?v=2Z8a94CWtCs

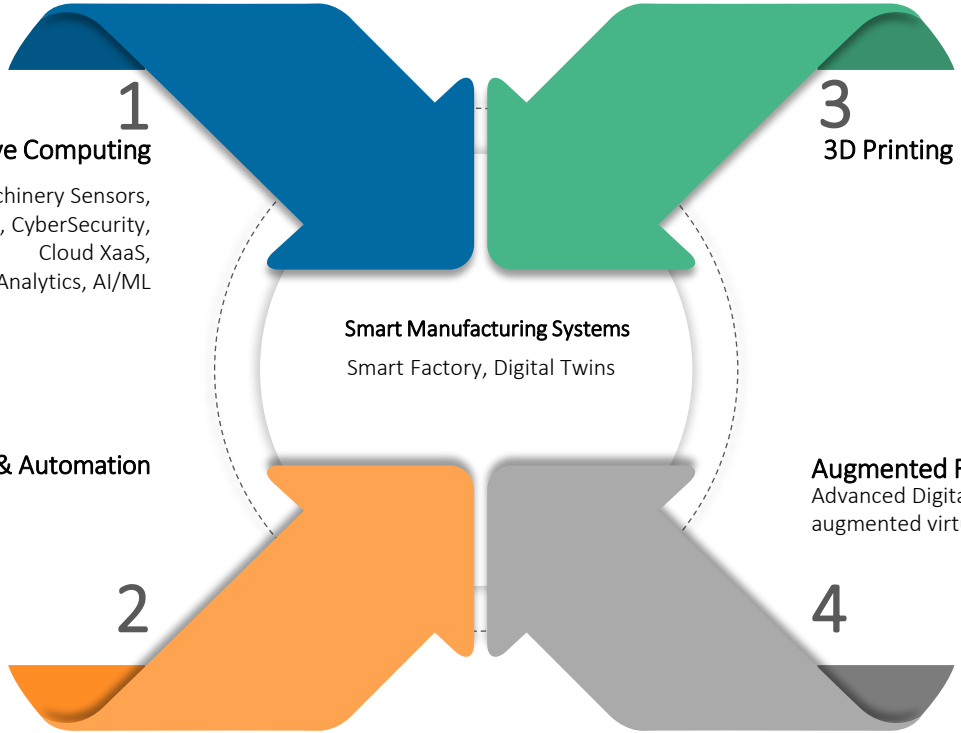
SECTION-2 SMART MANUFACTURING

Actors Ecosystem
Tech Ecosystem
Process cycle
Tech Stack

Smart Manufacturing – Actors Ecosystem

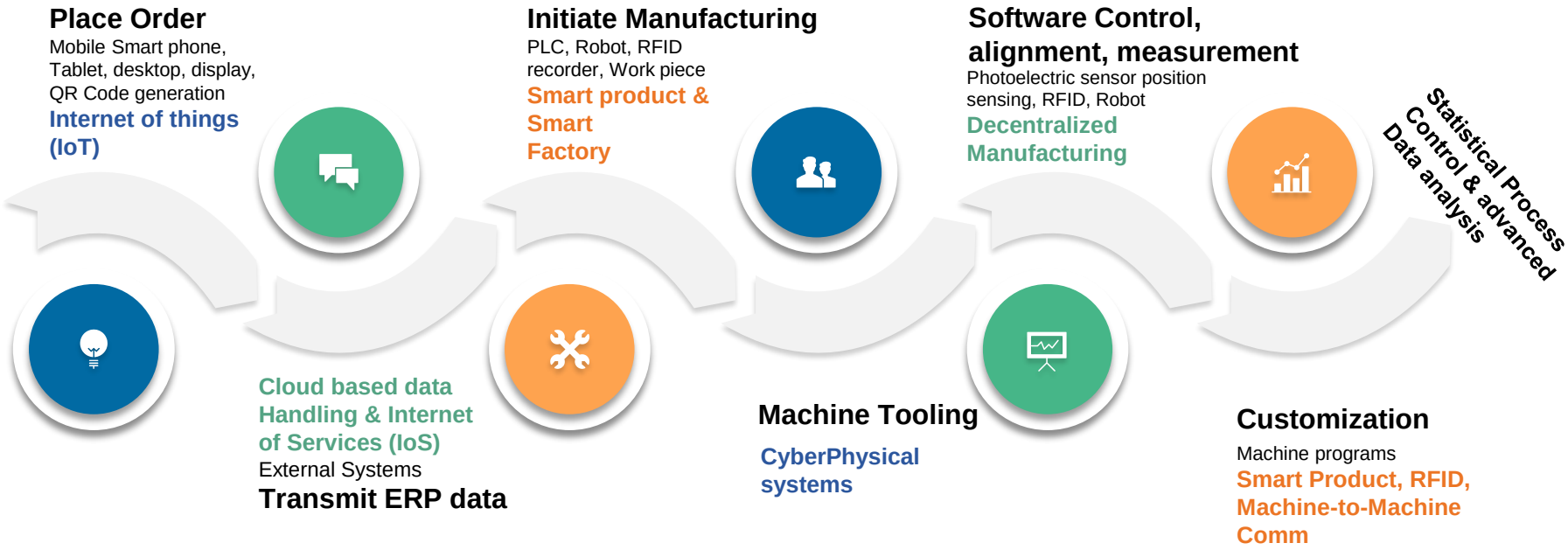


Smart Manufacturing – Technologies Ecosystem



Digital/Smart Manufacturing Process cycle

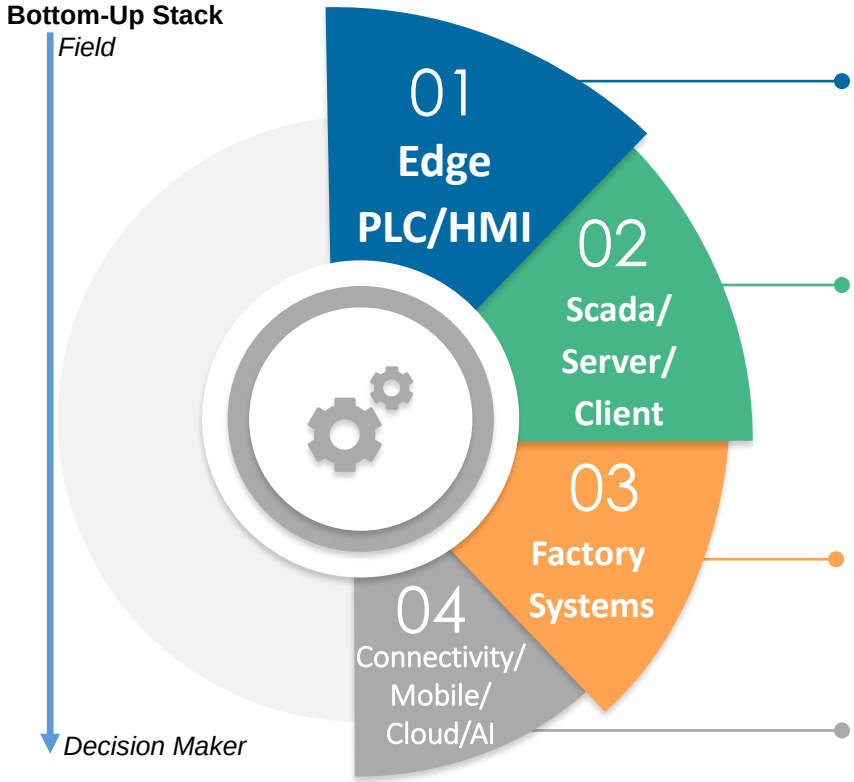
Technology concepts - case of product customization



https://www.youtube.com/watch?v=Ropu4FwMEHo

Technology Stack: bottom-up

Solution drivers? A case of Industry 3.0 to 4.0 migration



Allan Bradley Control Logics, Allan Bradley Micro Logics, Siemens step7
EasyRack, Wago, EasyAutomation, Red Lion, Opto 22, Raspberry Pi 310

Scada
Ignition, Canary, Kepler
OPC Server/Client
Kepler, PTC, Wonderware
MQTT Server
Factory Studio (FS), Ignition, Iconics, Win CC OA
Wonderware, Veva, Rockwell, FactoryTalk

MES/OEE systems - SAP, IBM, IYNO, MPDV, Cantier, Ordinal, Edinn, Qubes
WMS systems – Reflex, Swisslog, Mecalux
ERP - Ordering, Billing, Customer Experience (SAP, Microsoft, Oracle)

OT IT Analytics, Digital Twin

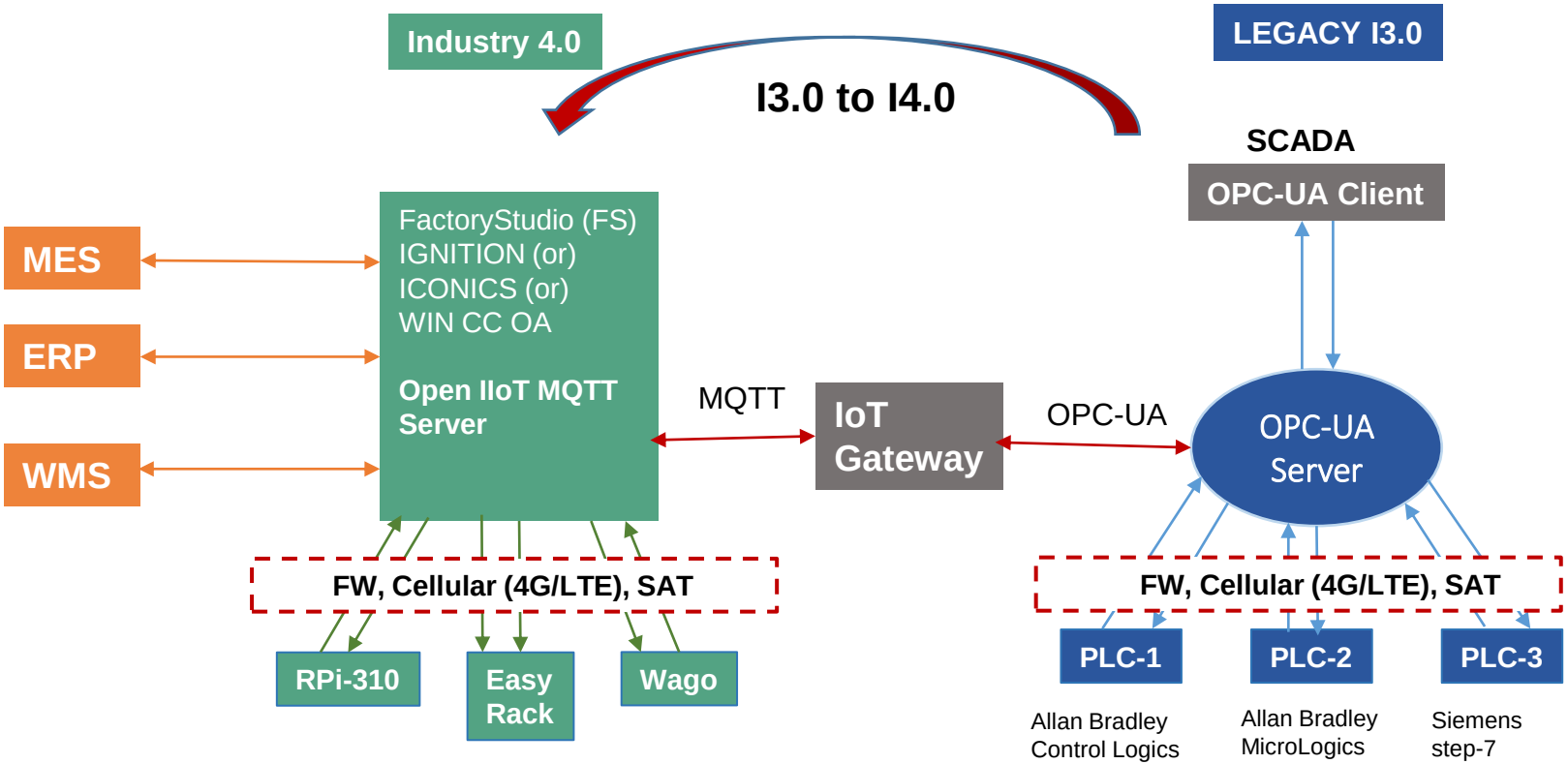
https://www.youtube.com/watch?v=f4LZtQ2SEDk

SECTION-3 INDUSTRY 3.0 TO 4.0

Industry 3.0 vs 4.0: Migration and projects

Startups Ecosystem

Industry 3.0 to 4.0 Migration



https://www.youtube.com/watch?v=f4LZtQ2SEDk

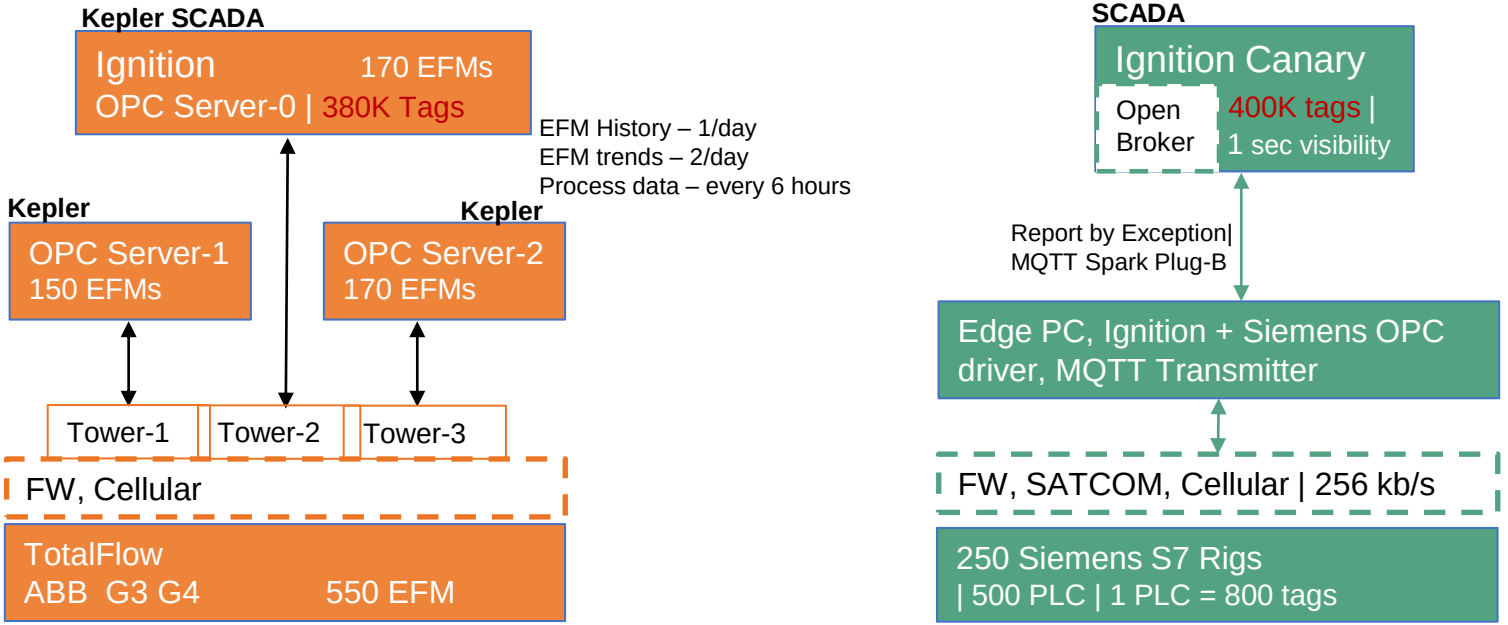
Industry 3.0 vs Industry 4.0

A case of Remote Control, Monitoring & Operations optimization project

Oil & Gas vertical
High margin case | 8 weeks
3 Poll response | Server Driven| Heavy

Same needs

Mobile Waste Water treatment
Low margin case | 6 months
RPE| Edge driven| Light weight



https://www.youtube.com/watch?v=2Z8a94CWtCs

SMART MANUFACTURING- TOP STARTUPS

Complementors ?

FogHorn| SWIM.ai

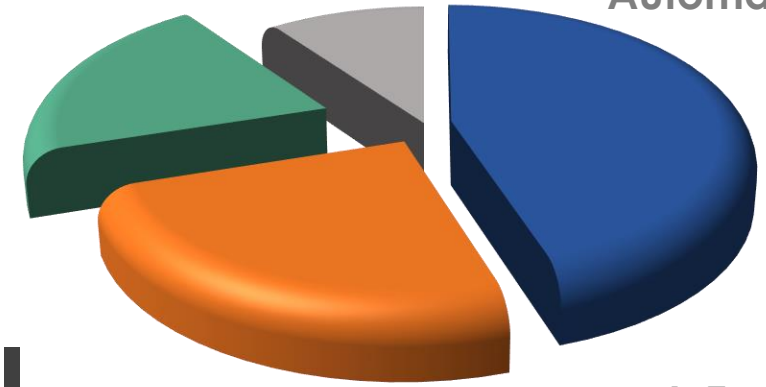
Edge Computing

Competitors ?

Manufacturing Efficiency | Automation

Bright Machines | READY Robotics| Element Analytics| GEM| Sight Machines| Machine Metrics| Samsara| Vibrobox| Machine Vision| dDriven

Based on "HEALTH"
Has customers (and/or)
Funded (and/or)
Partnered (and/or)
headcount growth



Partners ?

IoT & IIoT Security

Dragos| IoTium| Xage Security| Rosetta Systems| Armis Security

Tulip| Uptake| Smart Industry Solutions| Edge2Web

Others

Co-innovators?

https://www.thomasnet.com/insights/7-industrial-iot-startups-you-should-watch-in-2020/ | https://www.forbes.com/sites/louiscolumbus/2019/02/03/top-25-iot-startups-to-watch-in-2019/#4e077cae3cc0 | https://www.startus-insights.com/innovators-guide/5-top-industrial-internet-of-things-startups-impacting-industry-4-0/

THANK YOU