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Medium Voltage Drive Cyber Physical Systems

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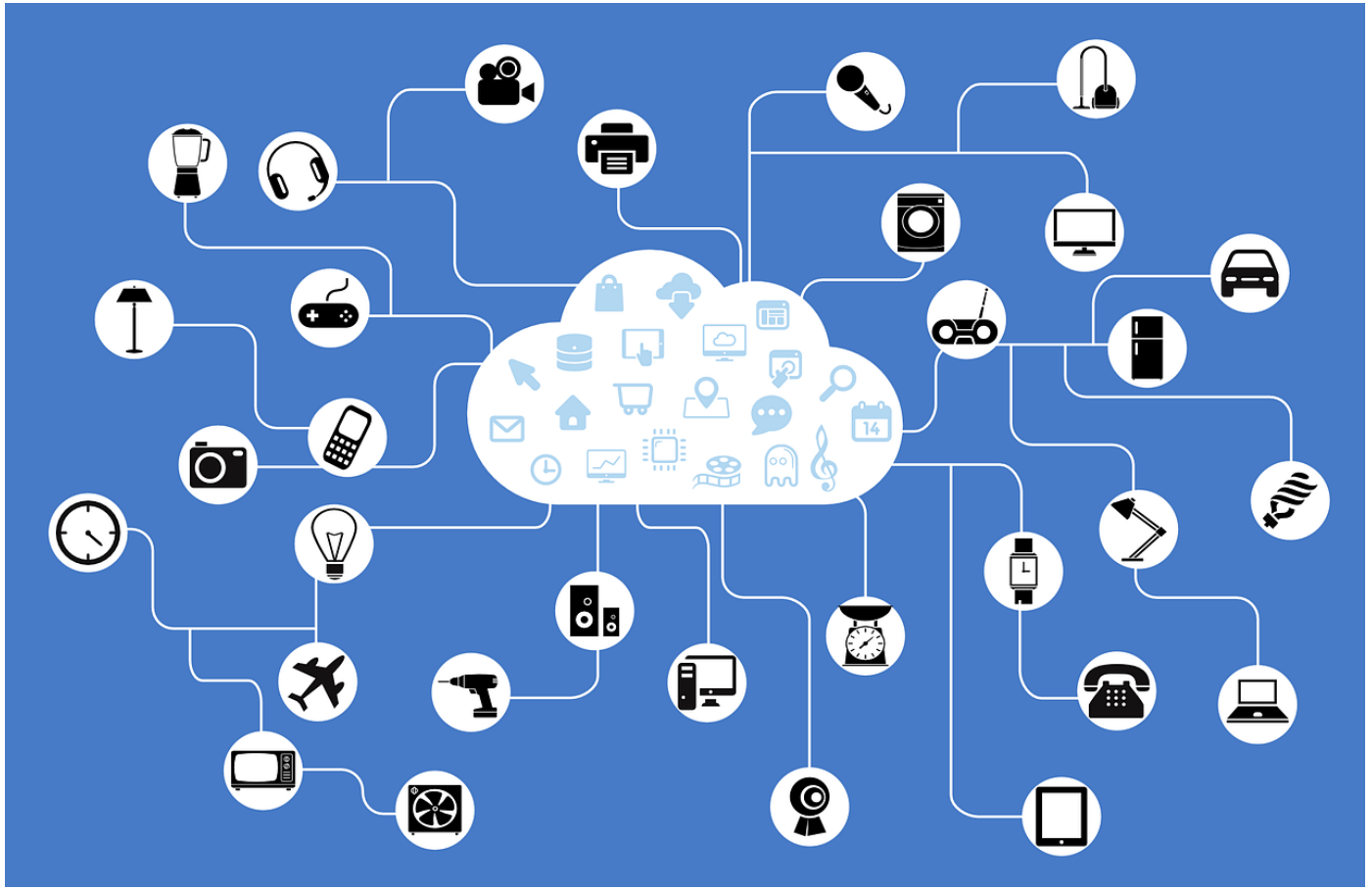
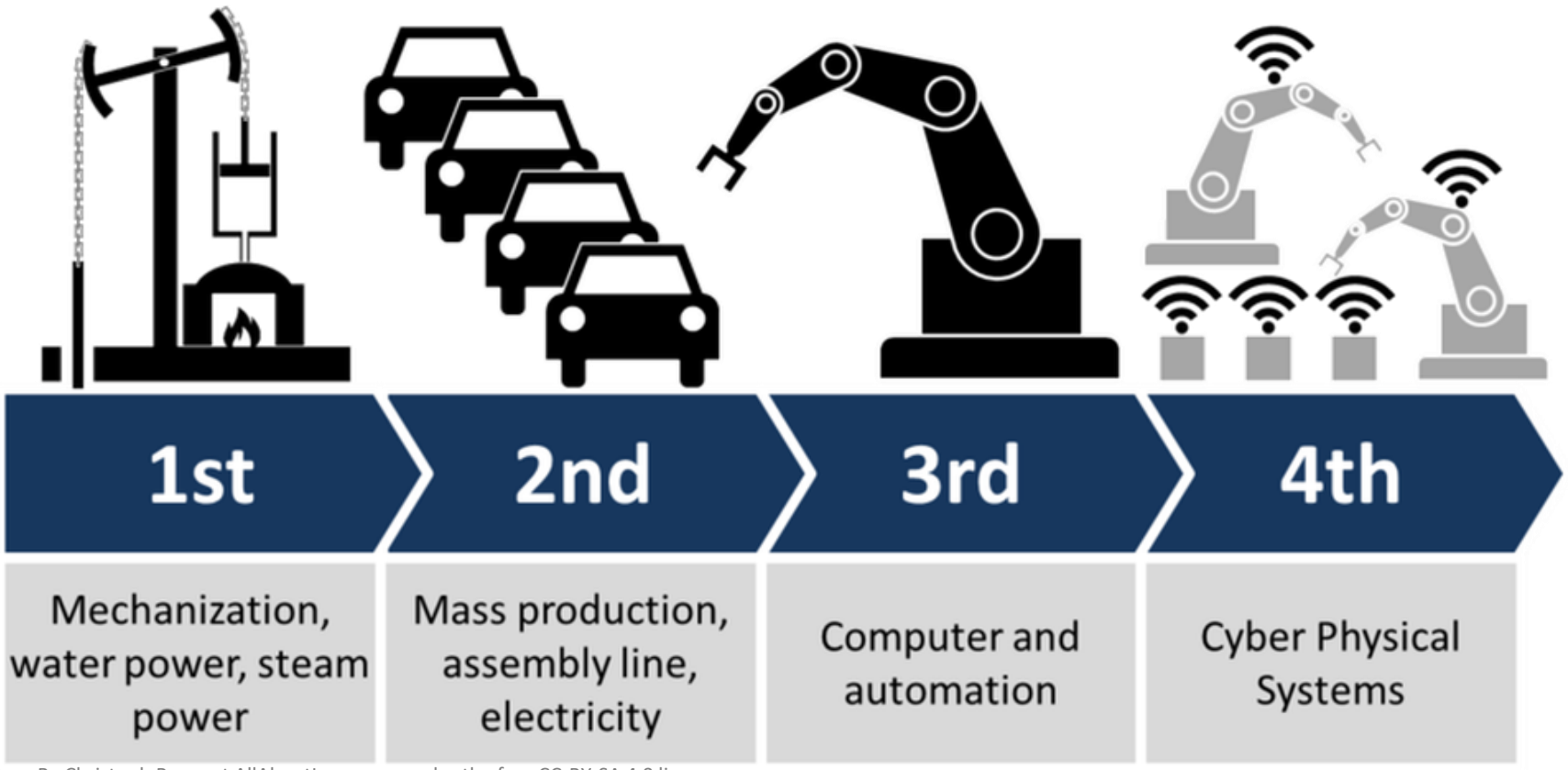
Contents

Internet of Things

- Sensors and data streams
- Embedded into every day items
- Pervasive computing
- Consumer and Industrial products

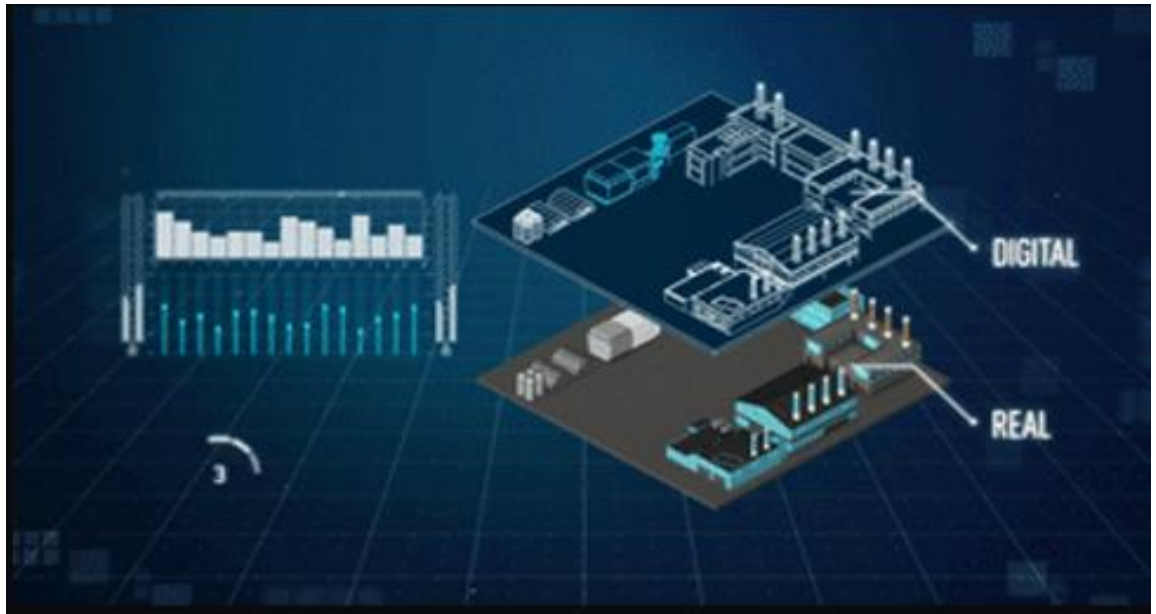


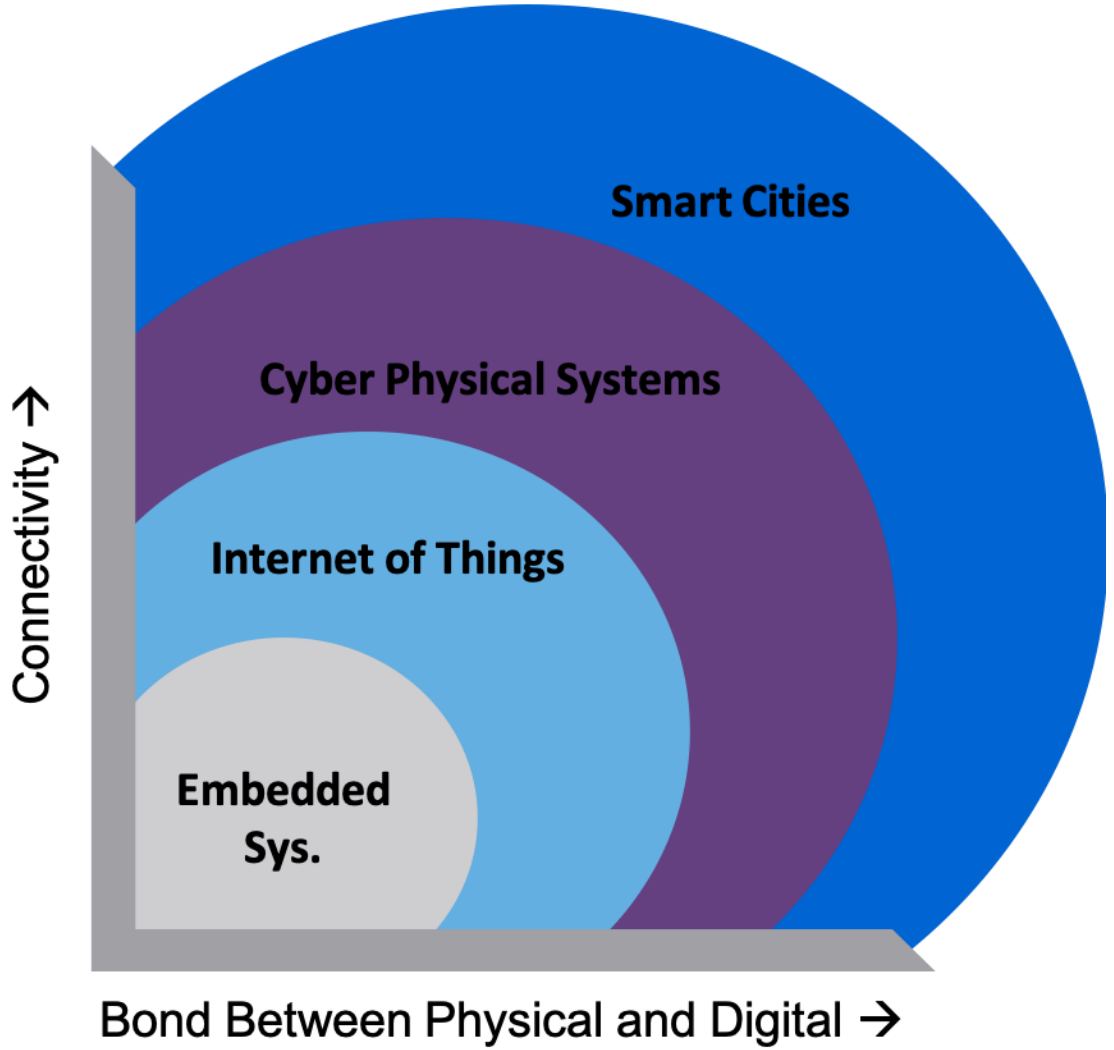
CPS and Industry 4.0



Cyber Physical Systems

- IoT is a building block/enabler of CPS
- Digital Twin
- Edge computing
- Artificial Intelligence
- Harmonious integration



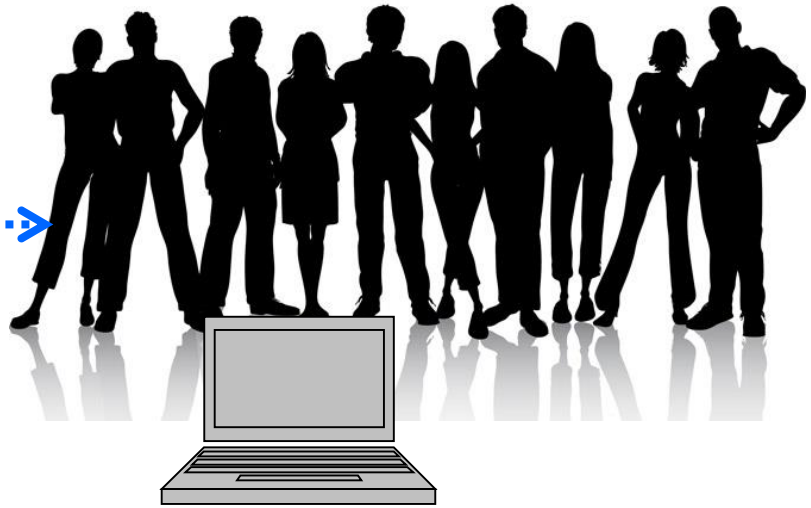


MV Drive Key Component in Cyber Physical System

Core capability of Medium Voltage Drive Edge Computing Gateway: Local edge computing device that allows customer configurable data collection and enables smart, early decision to ensure optimum performance and maximum reliability.

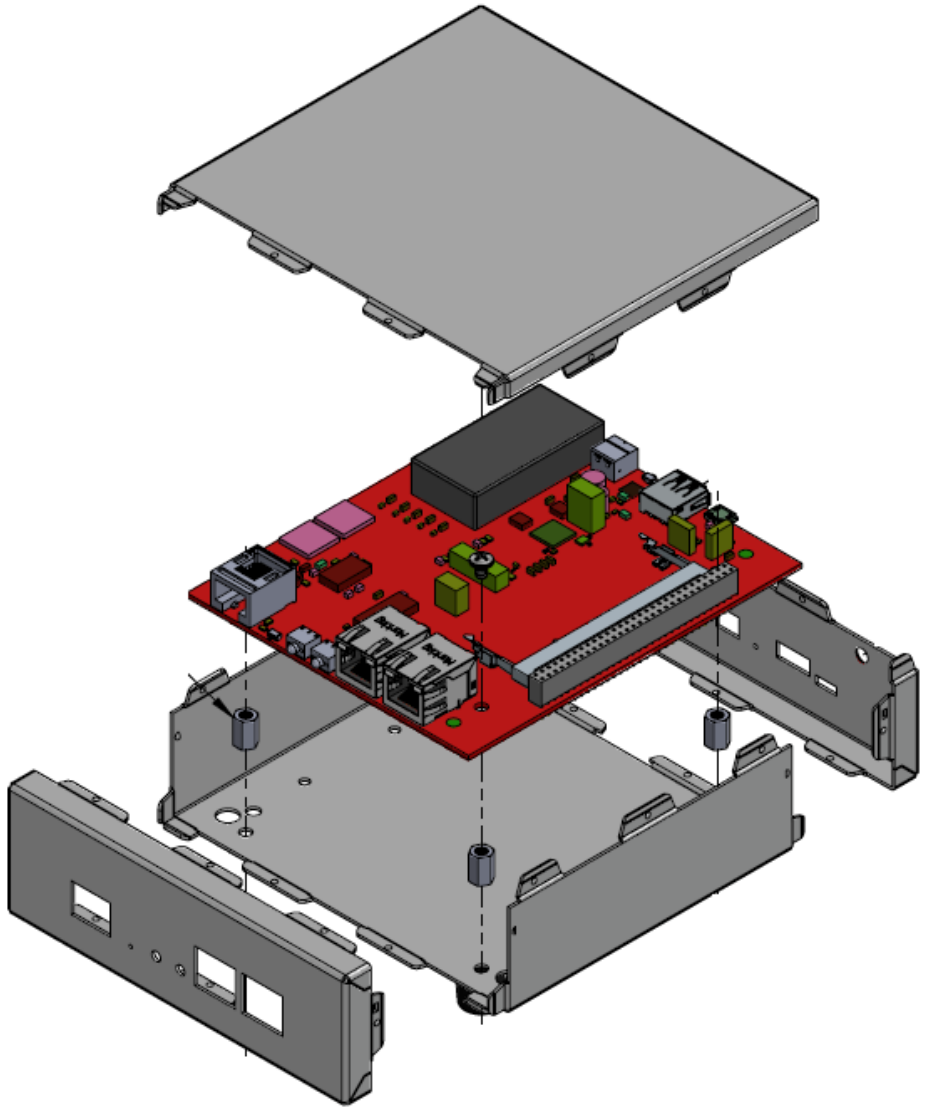
MV2

TIC Edge Computing Gateway



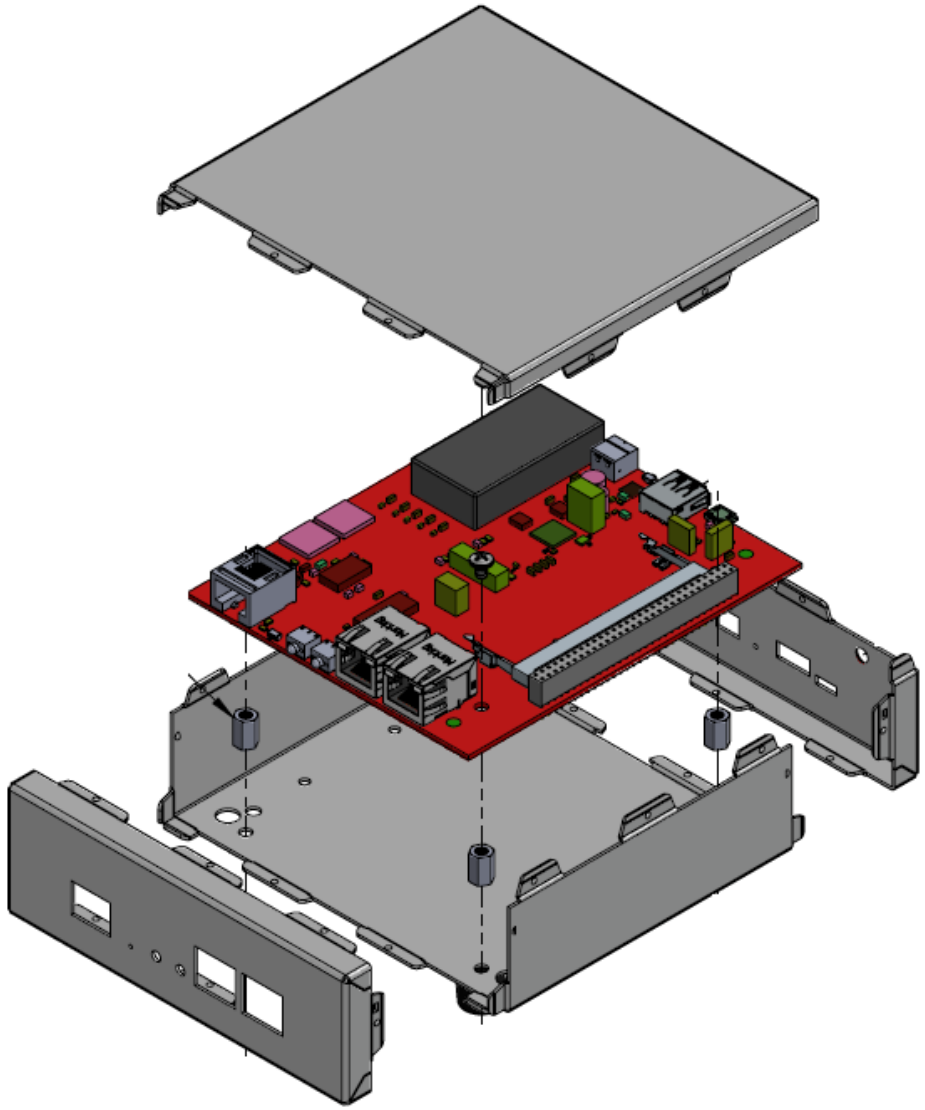
MV Drive Key Component in Cyber Physical System

- Local control of data
- Modular design
- Communications / Internet Technology
  - Proprietary protocols for product lines
  - Building management protocols
  - Web interface
  - Email
- Analytics
  - Data collection and abstraction
  - Mirrors state of drive
  - Parses high resolution data points around critical events



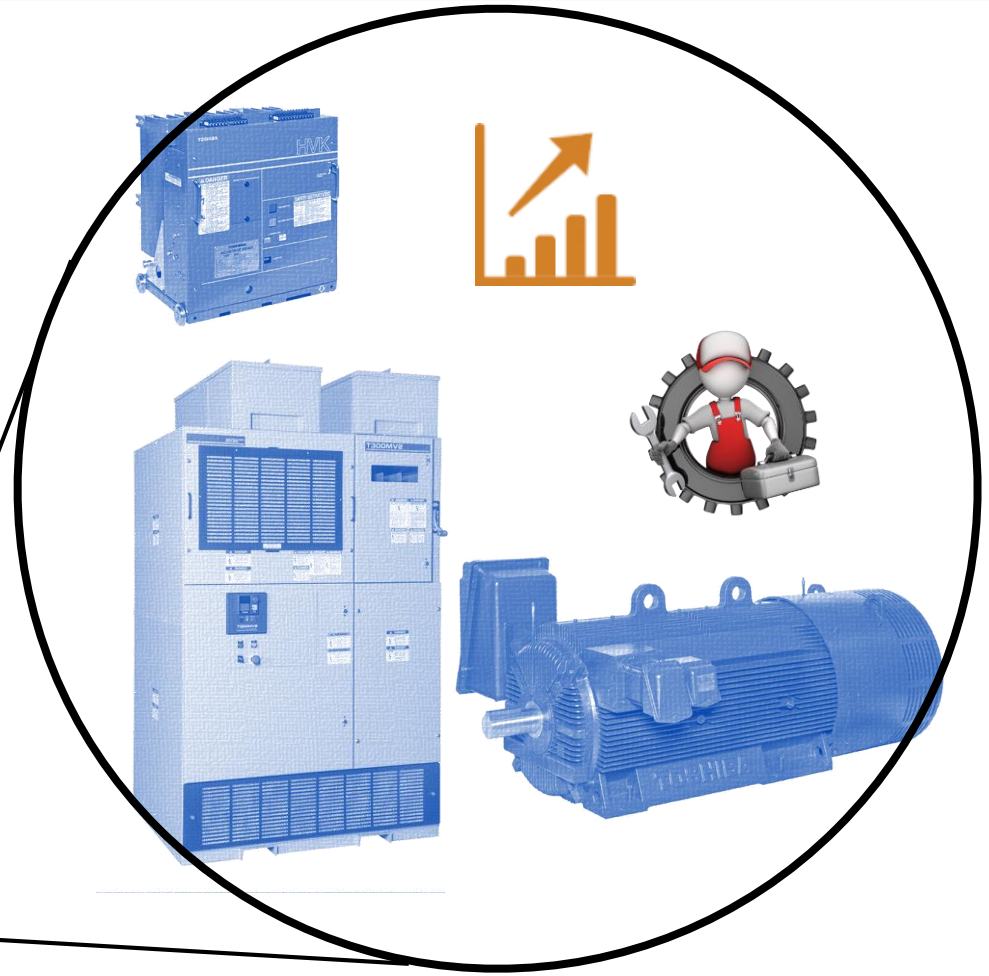
MV Drive Key Component in Cyber Physical System

- Expanding scope
- Expanding feature set
  - Connectivity
  - Communications protocols
  - Addition alert methods
  - Cloud platform options
  - More predictive less reactive
- Ensure optimum drive performance over lifetime of system through:
  - Trouble Shooting Support
  - Remote Access Anywhere
  - Advanced Data Analytics
  - Predictive Maintenance
  - Real Time Monitoring



Looking Forward

TOSHCare™



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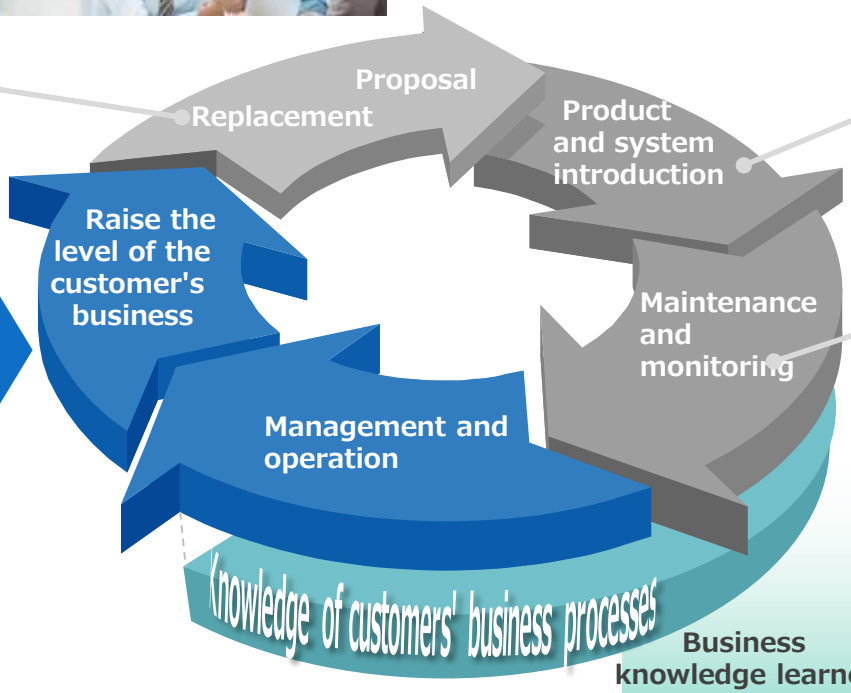
Field Service
Pride & Professionalism

CPS Application Through Spiral Life Cycle



New solutions proposals

- Optimize MV drive performance throughout lifetime
- Maximize system efficiency
- Minimize down time

Energy-saving | Cost reductions | Trouble shooting | Safety and peace of mind

Utilize Cyber Physical Systems and IoT to increase value to customer

Simulation Analysis ◀ Data Analysis ◀ Sensor Information

Business knowledge learned from the customer

TOSHIBA Field Service
Pride & Professionalism
TOSHcare™

Equipment knowledge accumulated by Toshiba

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Thank you