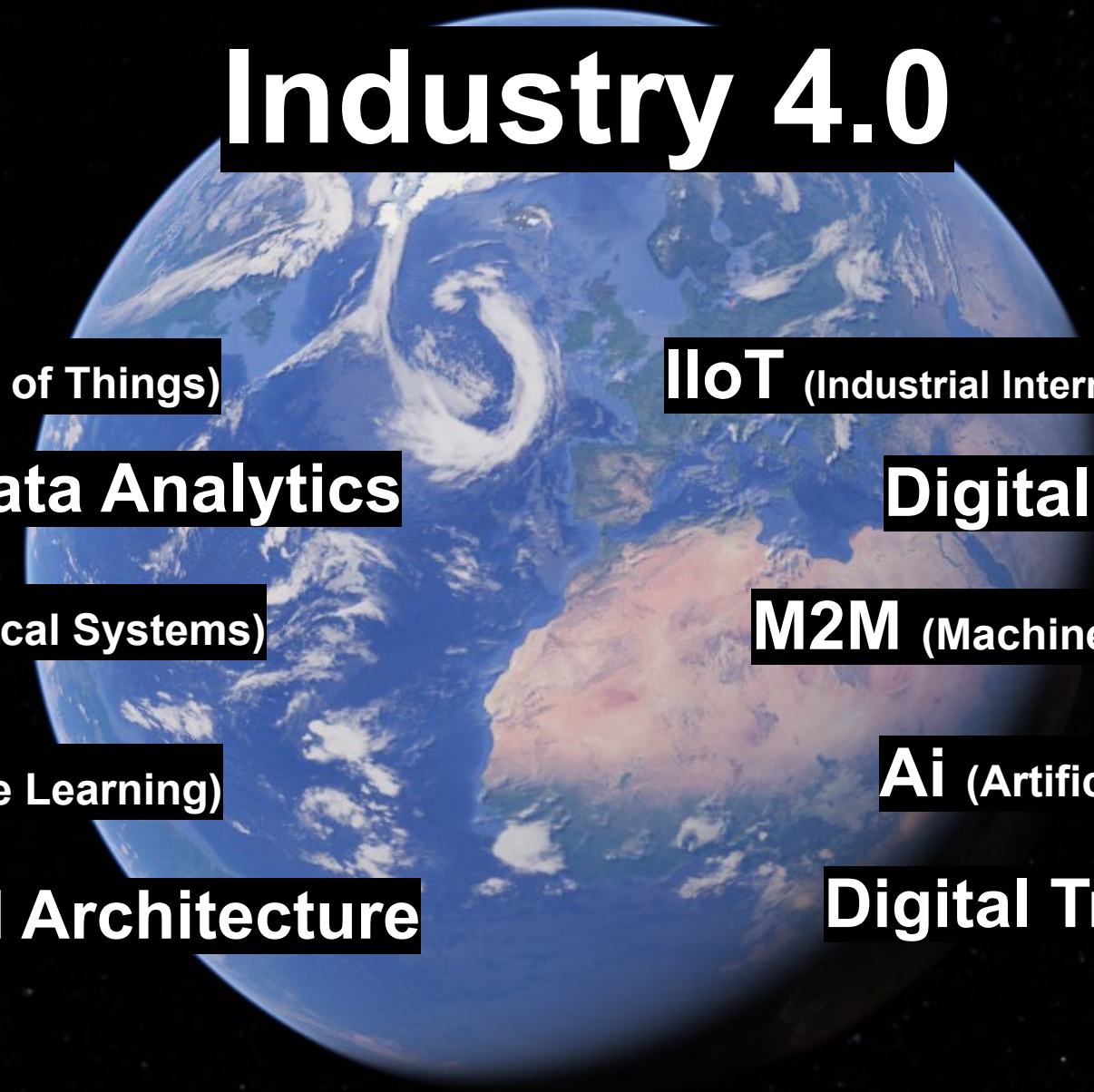
SMART EDU 4.0

SERC
INSPIRING. TRANSFORMING. ENRICHING.

- Ind 3.0 to Ind 4.0 Skills Gap ?
- What & Where are the skills gaps ?
- Automation Up-Skilling Pathways.

Industry 4.0



IoT (Internet of Things)

IIoT (Industrial Internet of Things)

Big Data Analytics

Digitalisation

CPS (Cyber Physical Systems)

M2M (Machine to Machine Comms)

ML (Machine Learning)

Ai (Artificial Intelligence)

Unified Architecture

Digital Transformation

Consumer & Home

Smart Infrastructure

Security & Surveillance

Healthcare

Network

Transportation

Retail

Industrial

Others

Consumer & Home

Smart Infrastructure

Security & Surveillance

Healthcare

Network

Transportation

Retail

Industrial

Others

Consumer & Home

Smart Infrastructure

Security & Surveillance

Healthcare

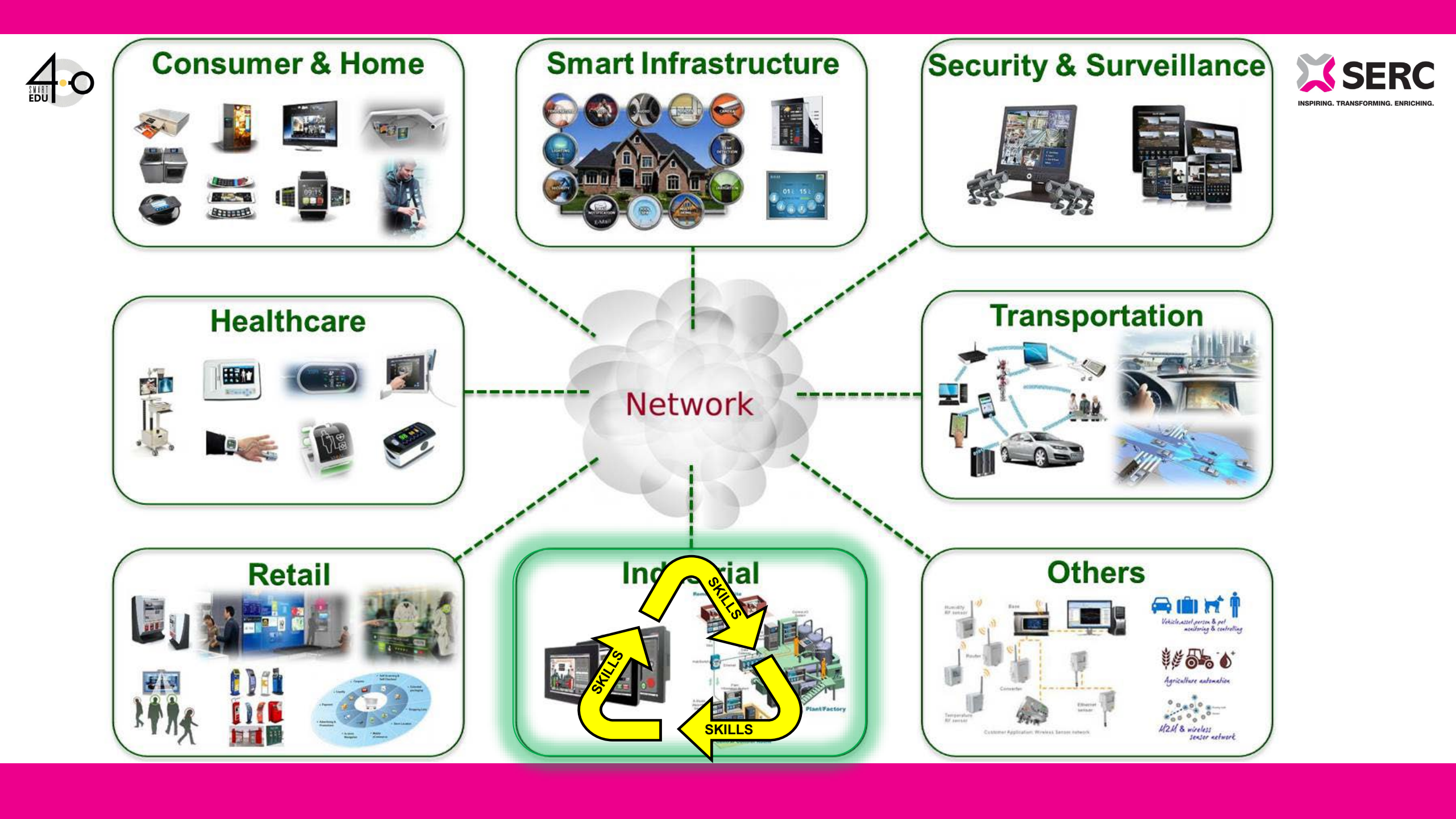
Network

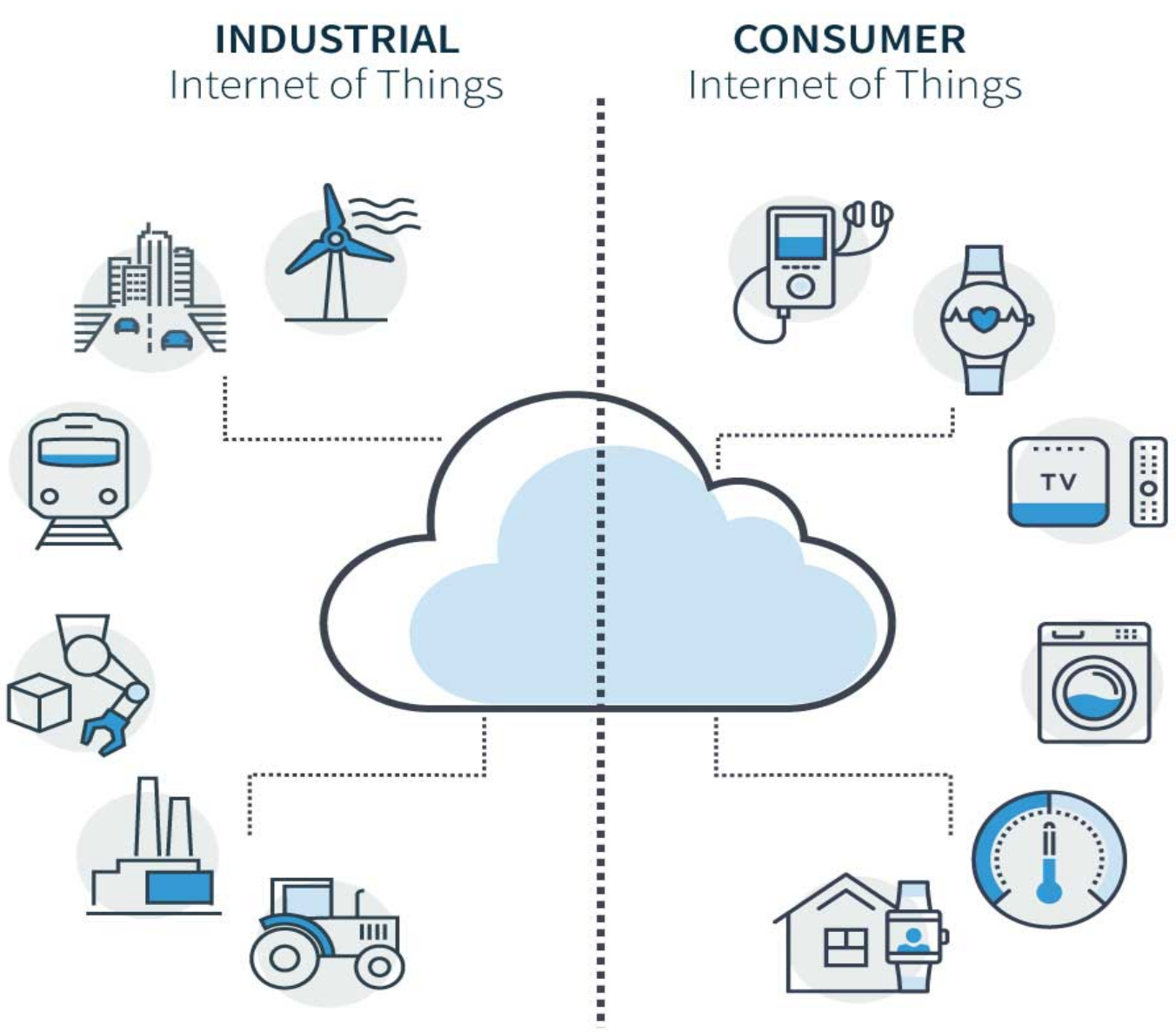
Transportation

Retail

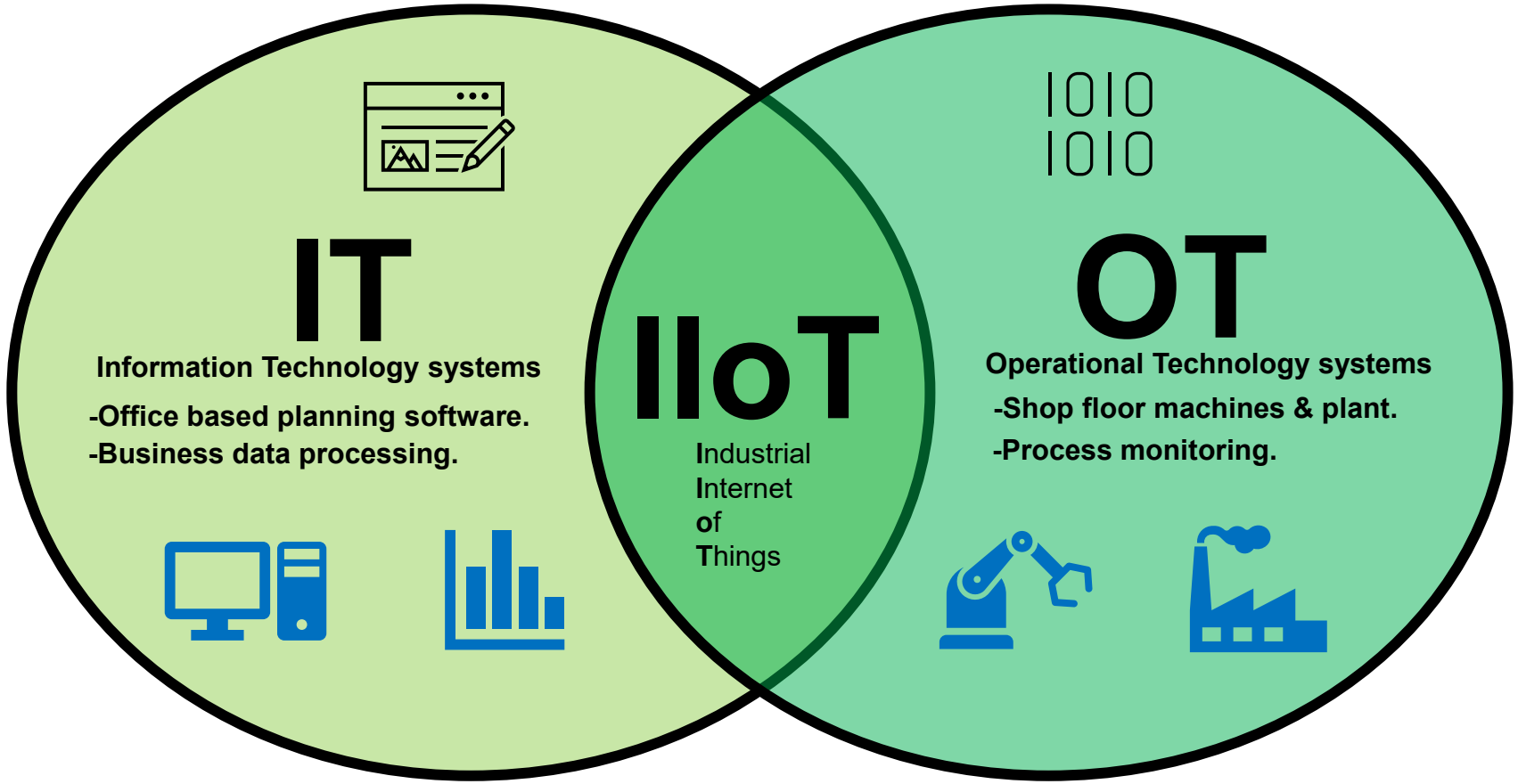
Industrial

Others


Consumer & Home
Smart Infrastructure
Security & Surveillance
Healthcare
Network
Transportation
Retail
SKILLS
SKILLS
SKILLS
Others
Plant/Factory
Agriculture automation
M2M & wireless sensor network

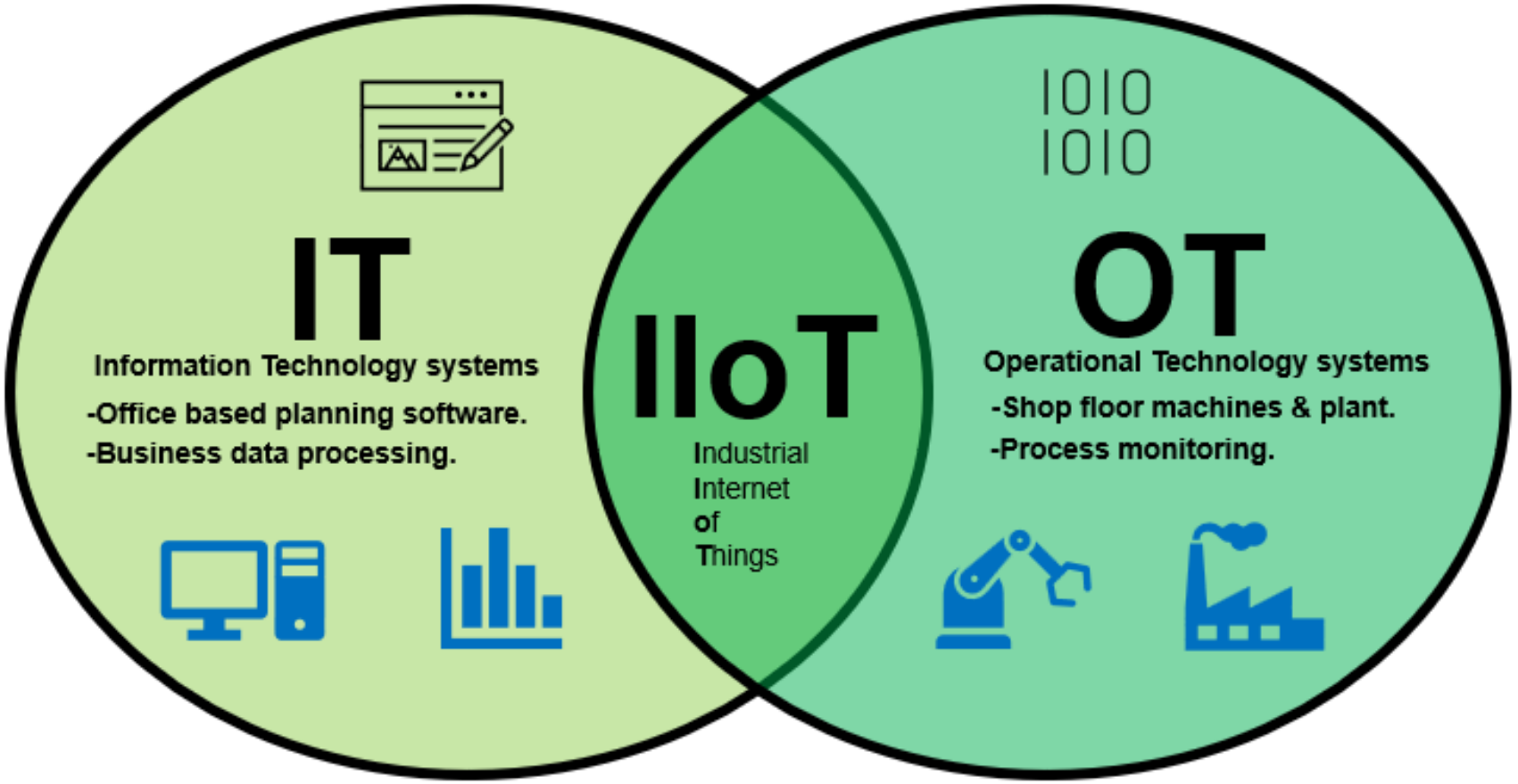

INDUSTRIAL
Internet of Things
CONSUMER
Internet of Things
TV

Systems Integration

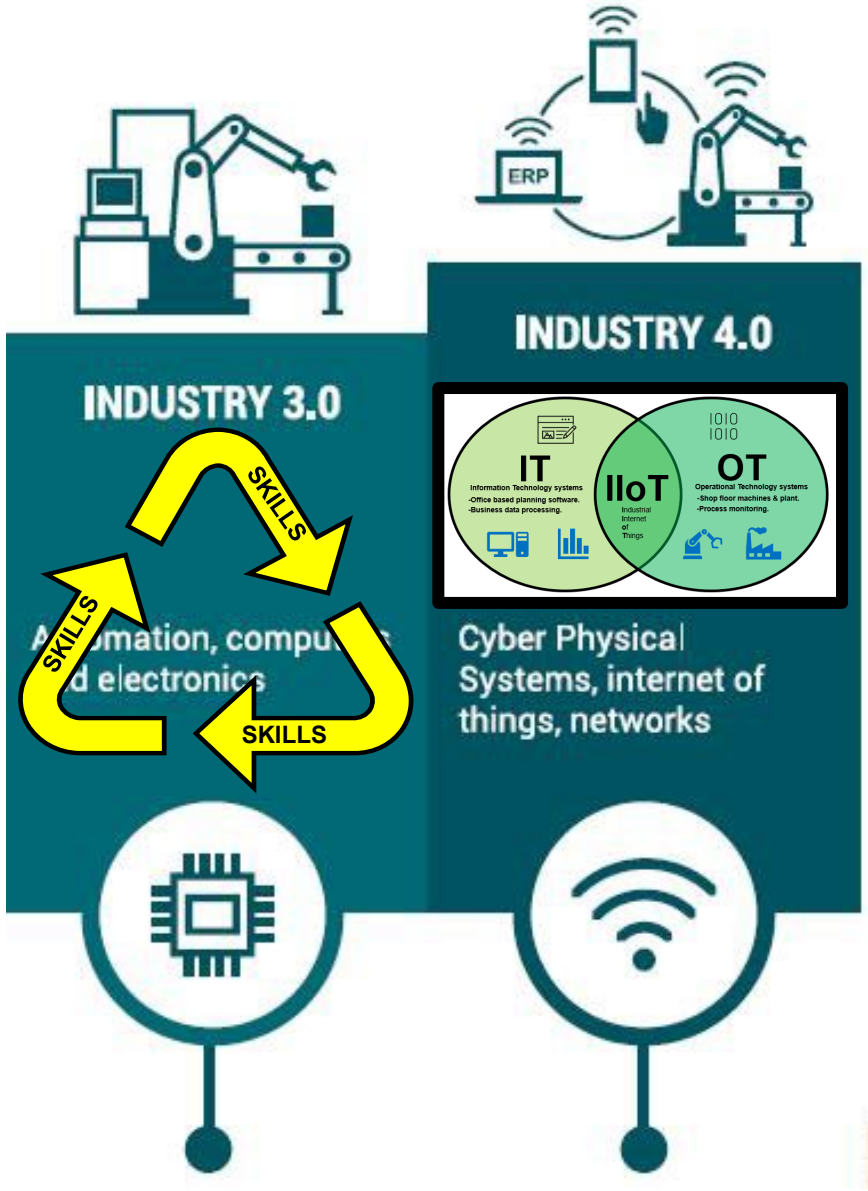


OT devices & systems need to be connected to IT systems to allow businesses to Digitally Transform into Industry 4.0 Enterprises.

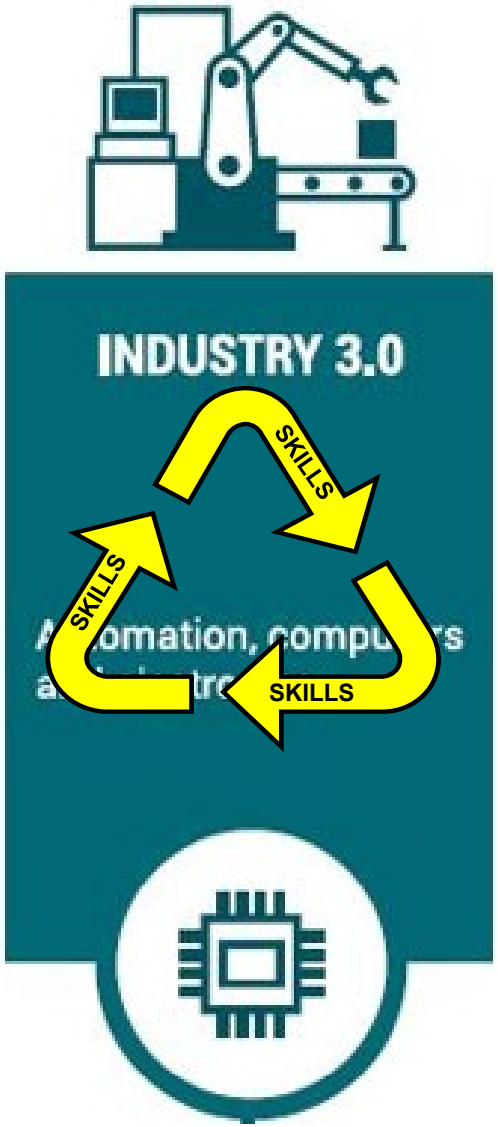
Systems Integration



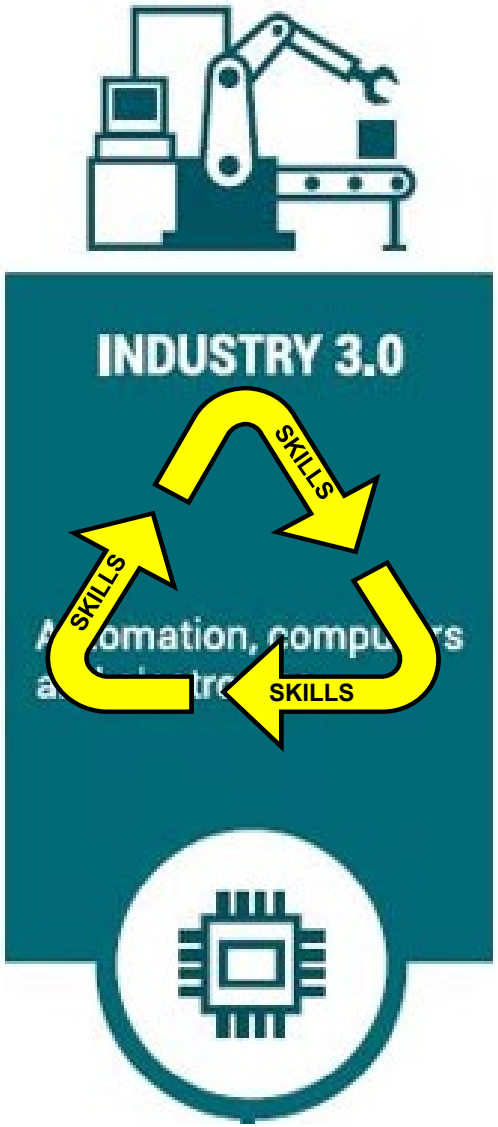
OT devices & systems need to be connected to IT systems to allow businesses to Digitally Transform into Industry 4.0 Enterprises.


ERP
INDUSTRY 4.0
INDUSTRY 3.0
IT
Information Technology systems
-Office based planning software.
-Business data processing.
IIoT
Industrial Internet of Things
OT
Operational Technology systems
-Shop floor machines & plant.
-Process monitoring.
SKILLS
SKILLS
SKILLS
Cyber Physical Systems, internet of things, networks

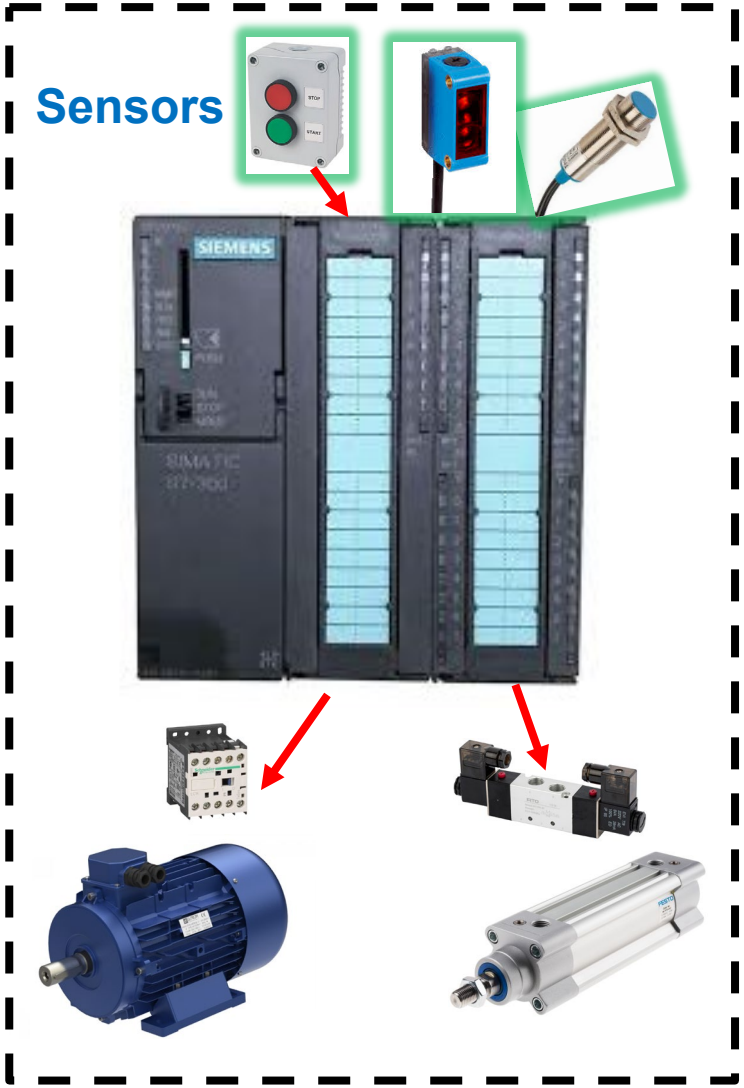

SIEMENS

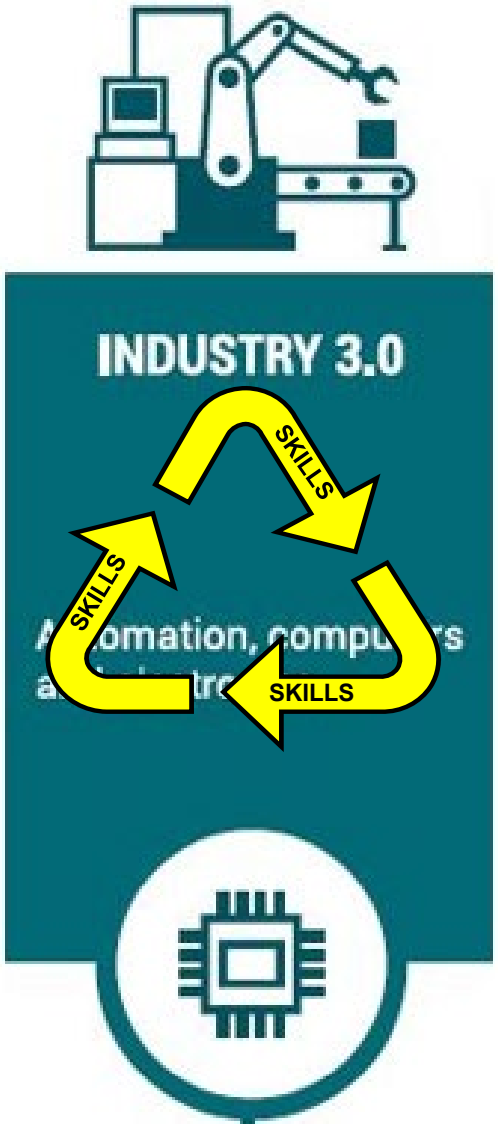

INDUSTRY 3.0
SKILLS
SKILLS
SKILLS

Machine



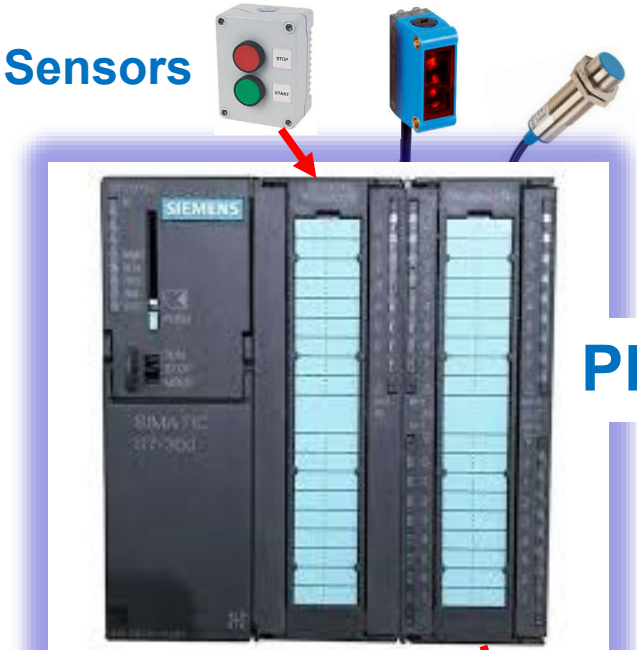
Machine



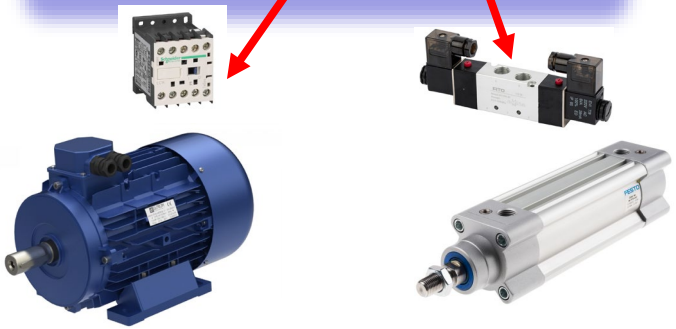


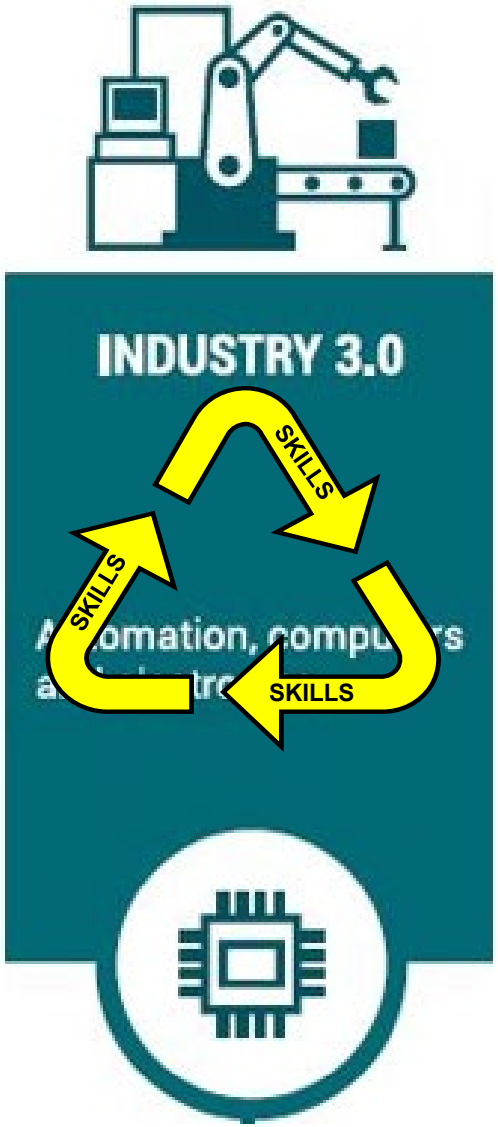
Machine

Sensors



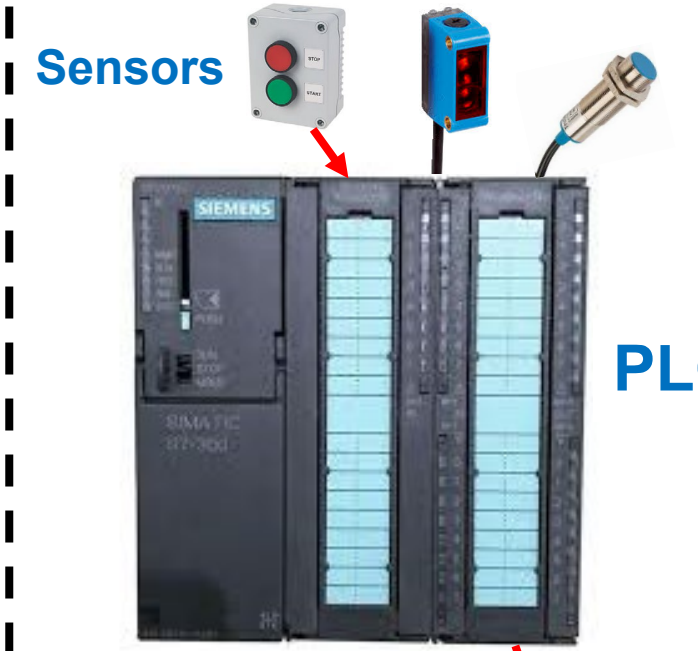
PLC Controller



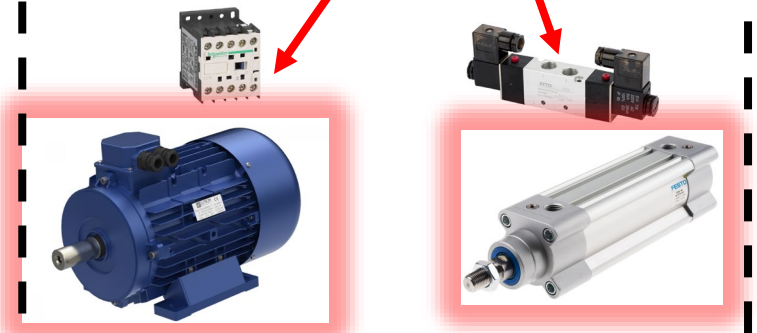


Machine

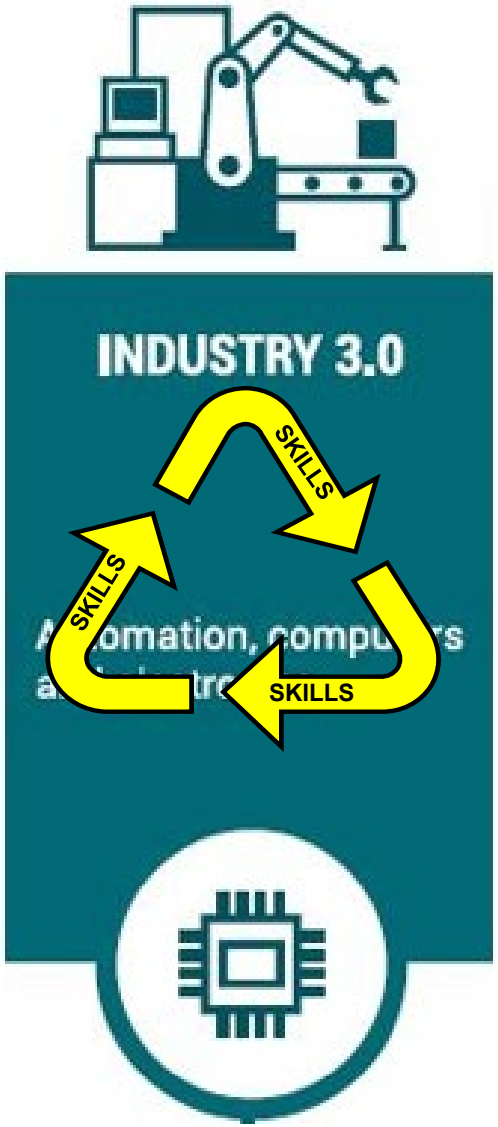
Sensors



PLC Controller

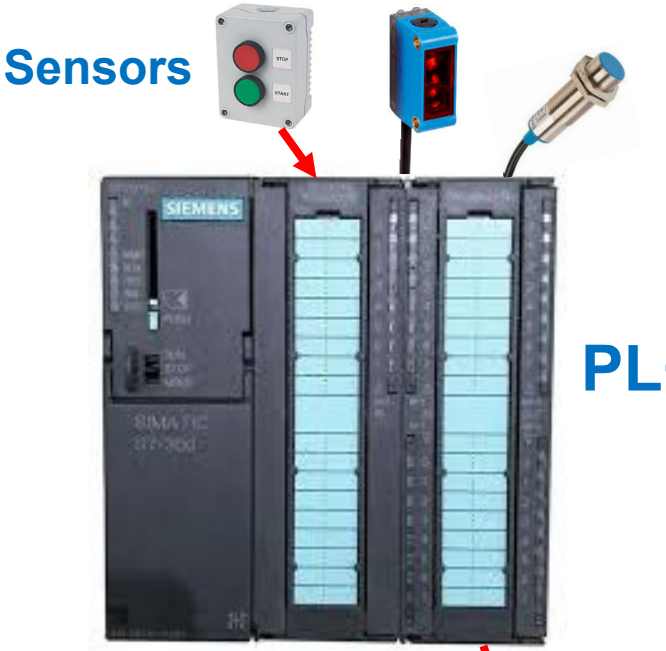


Actuators

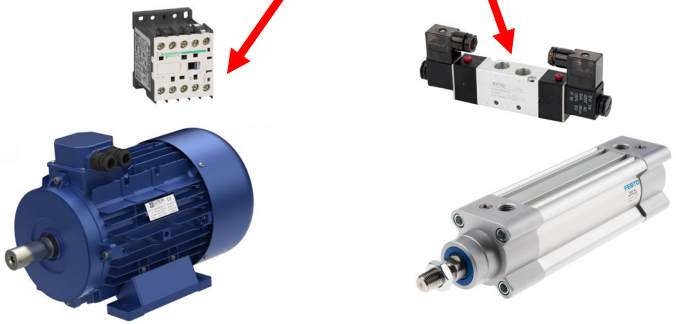


Machine

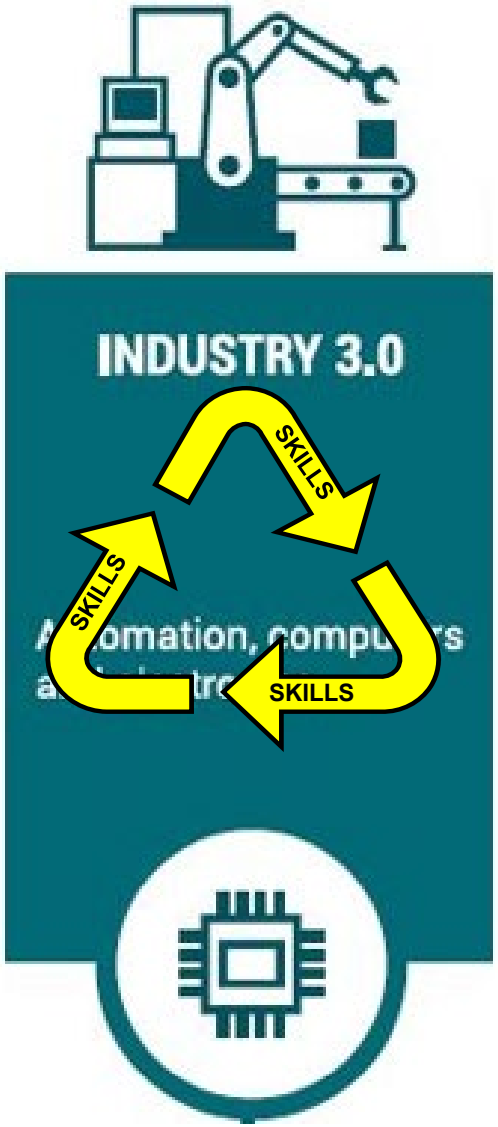
Sensors



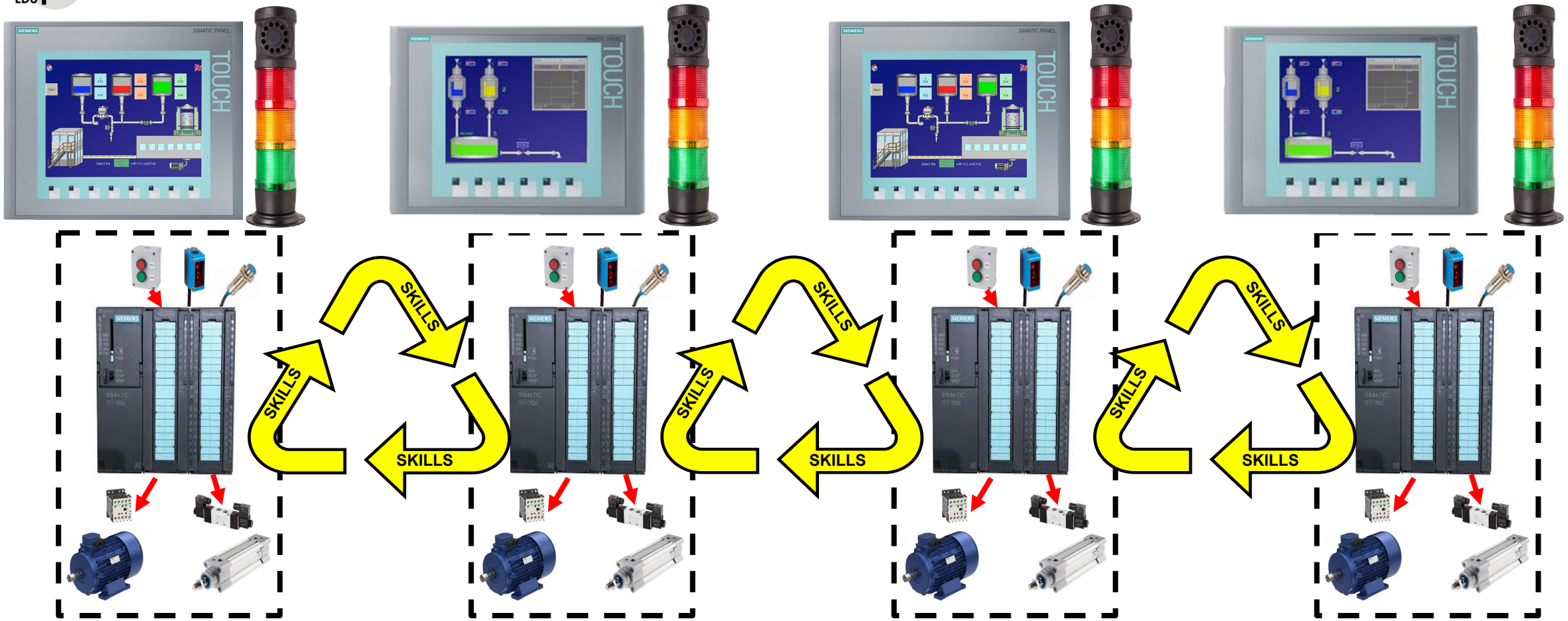
PLC Controller



Actuators



Factory Machines & Equipment

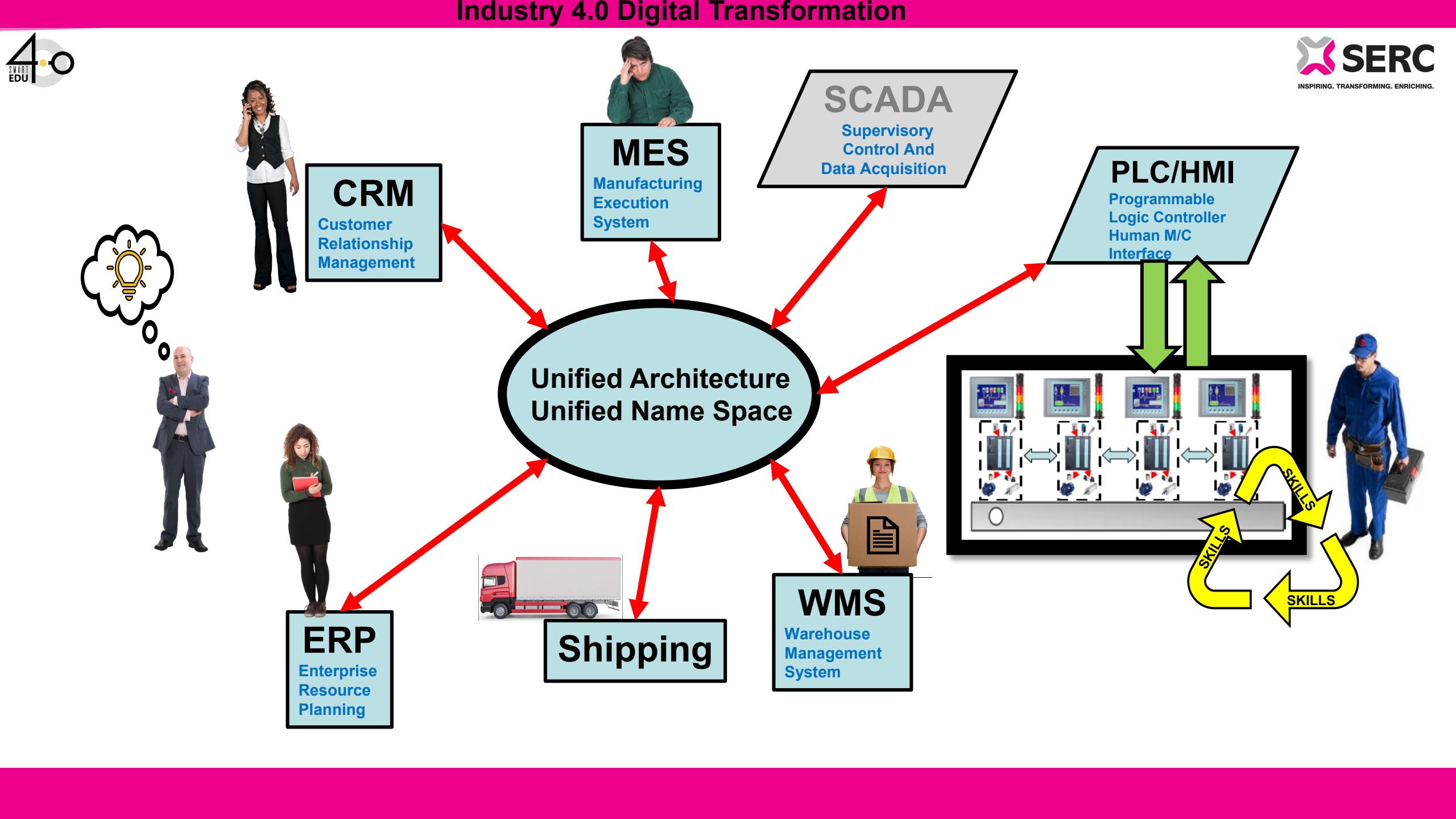


Automated Manufacturing Processes

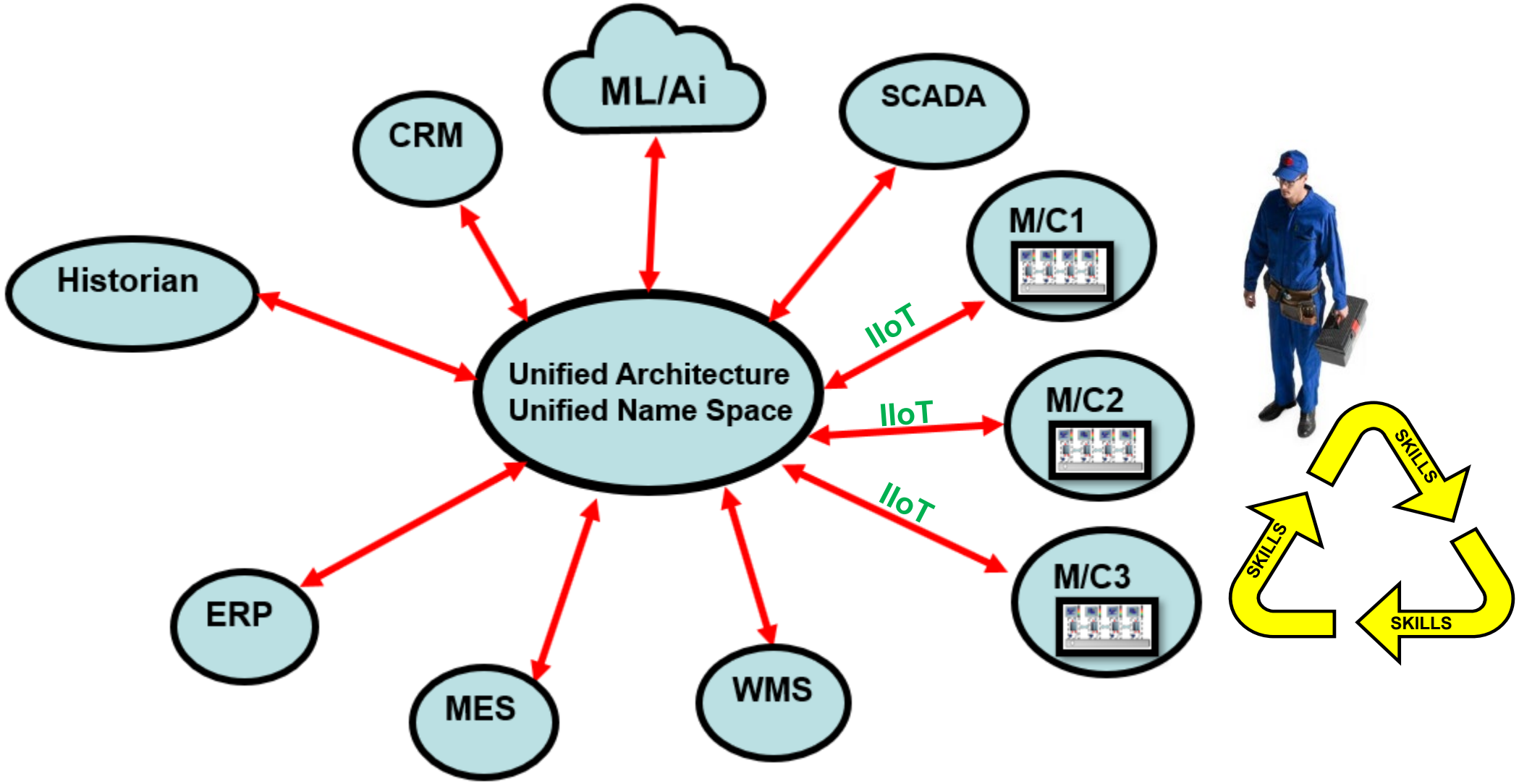
Raw Material Infeed

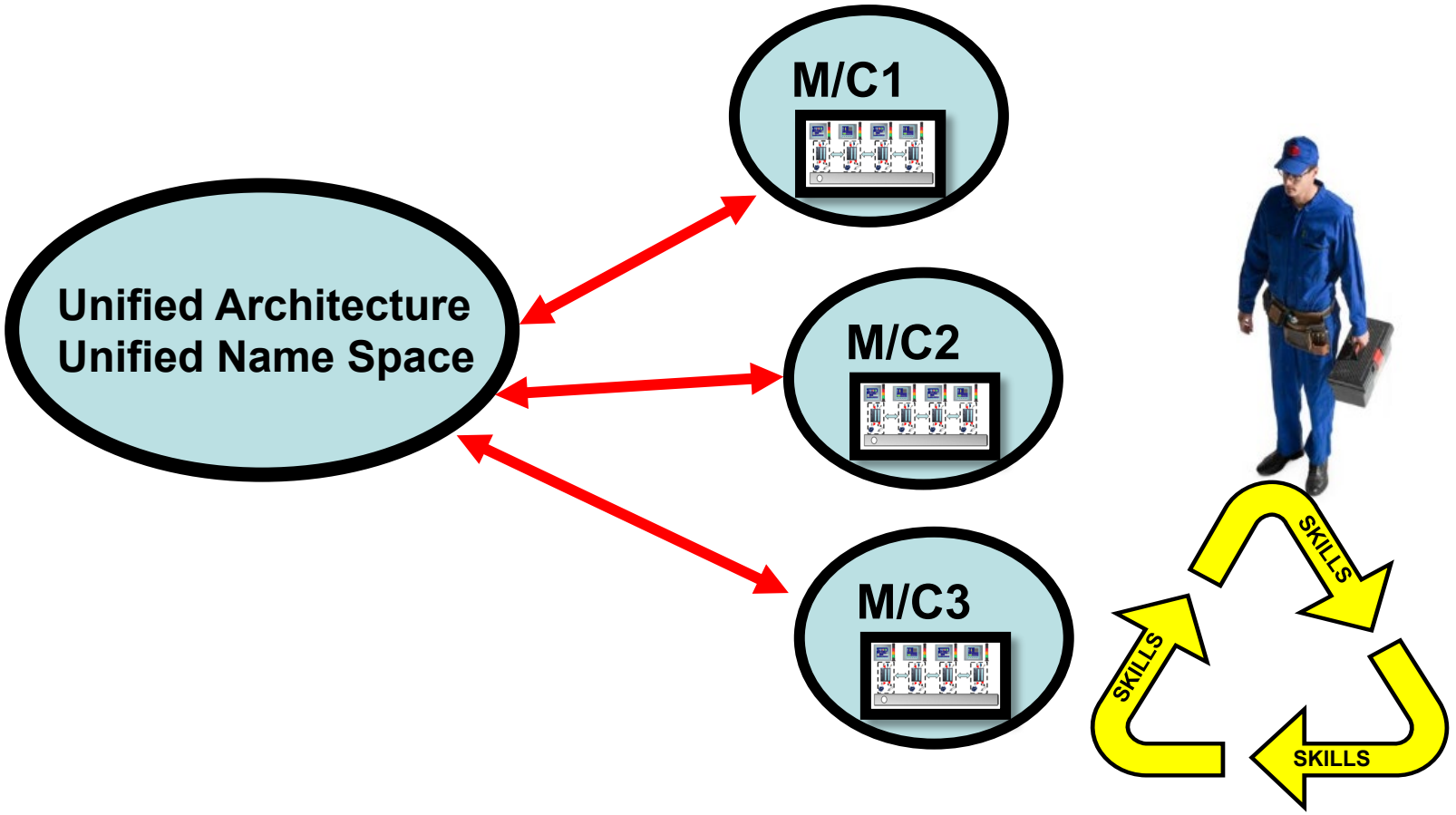
Finished Products Outfeed

Industry 4.0 Digital Transformation

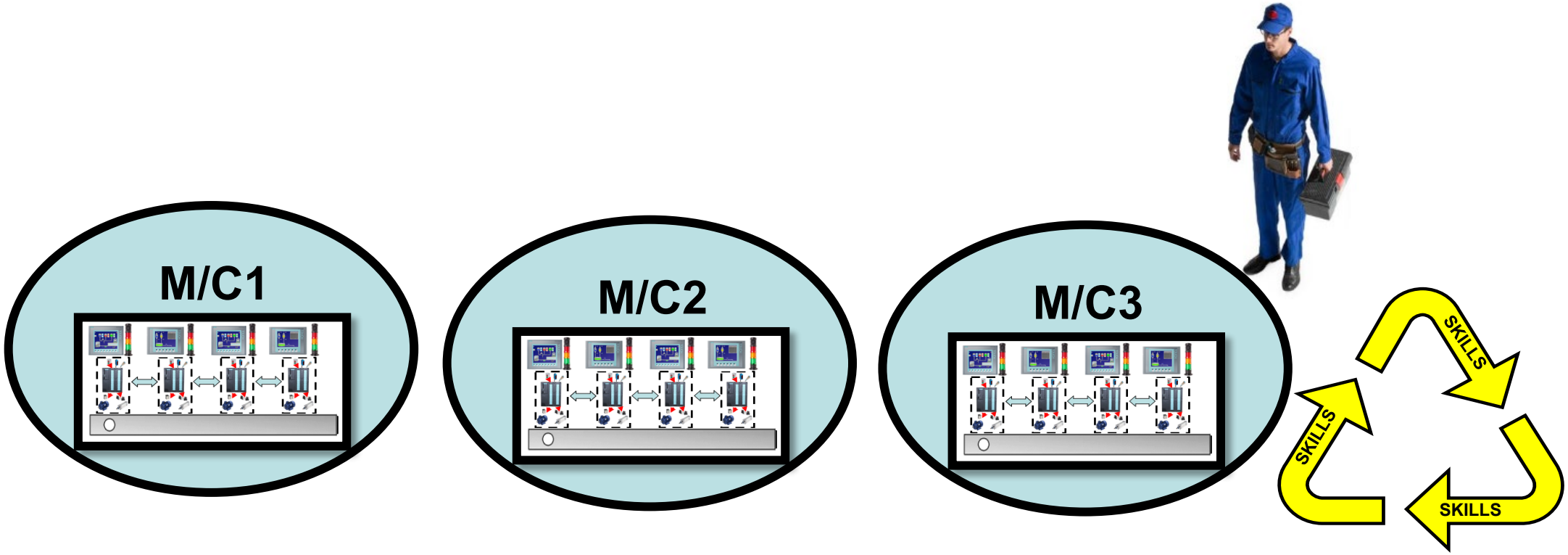


ISA-95 (IEC 62264) Hub & Spoke Architecture

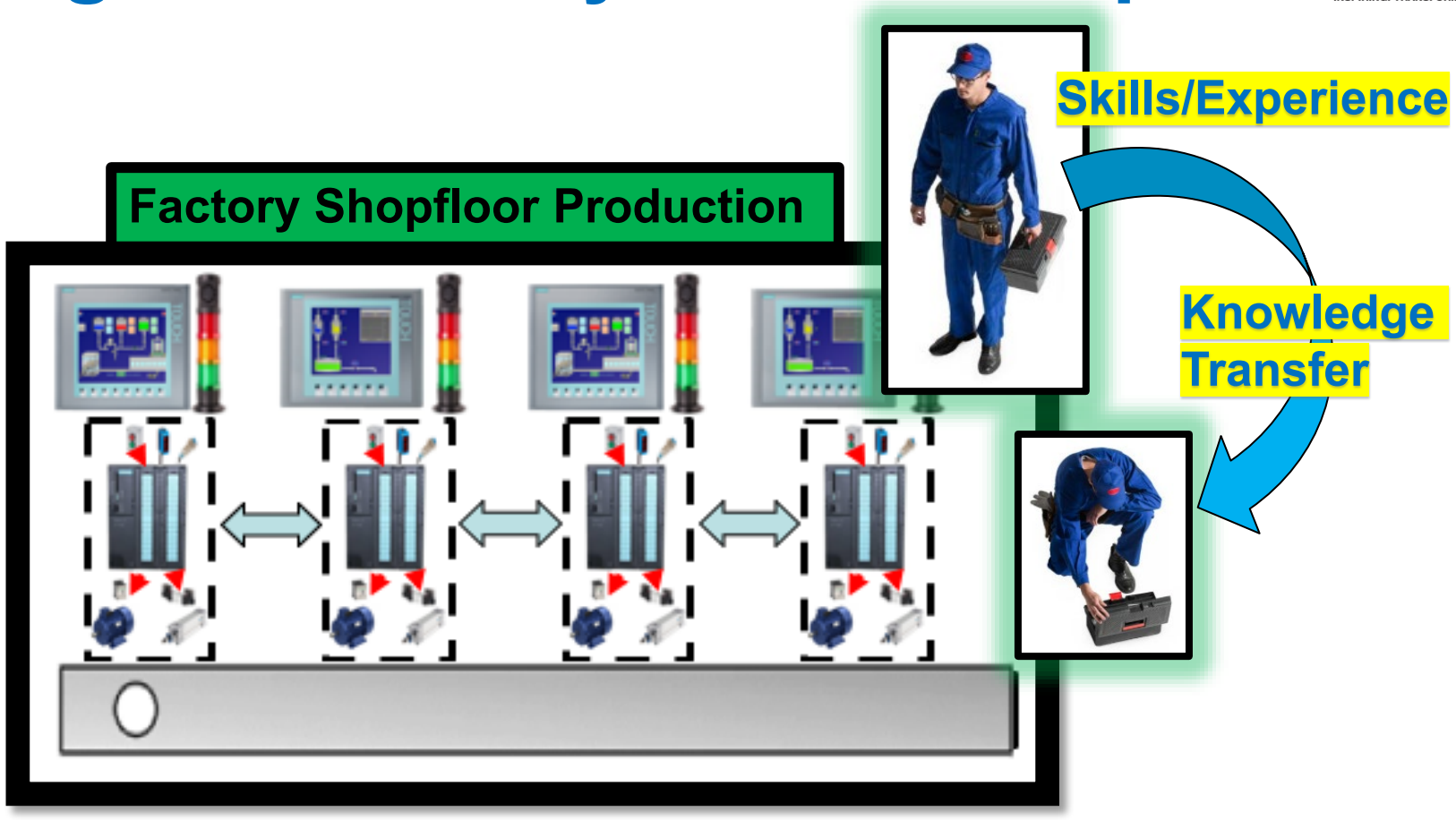



Unified Architecture
Unified Name Space
M/C1
M/C2
M/C3
SKILLS
SKILLS
SKILLS

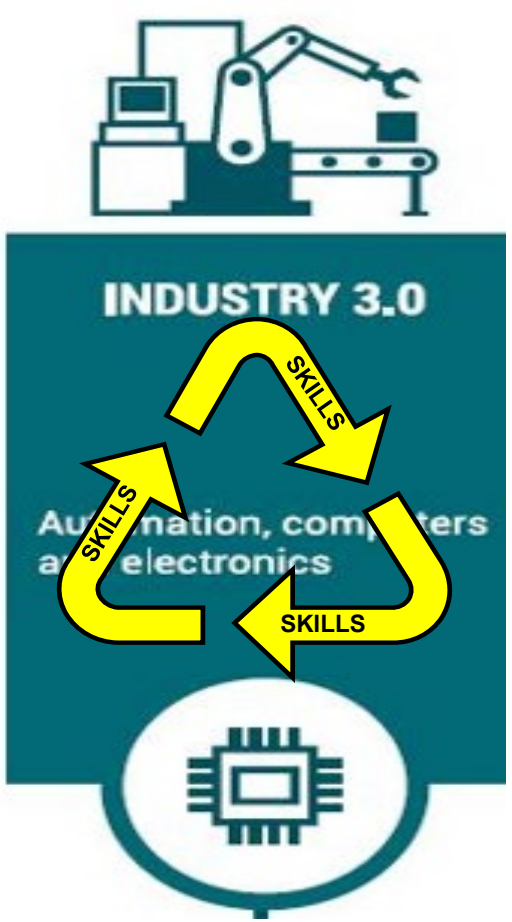
Industry 3.0 Automation Skills Gap Remains



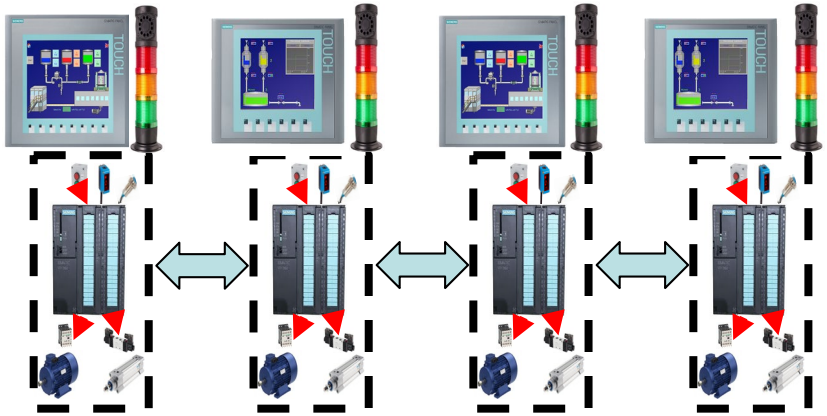
Addressing the Industry 3.0 Skill Gap



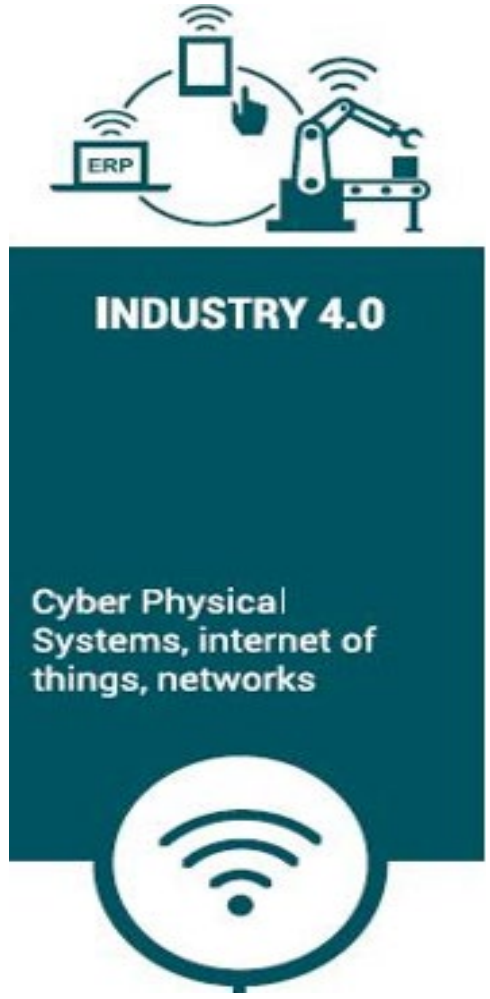
Industry 3.0 Skills Gap



TOP FLOOR



SHOP FLOOR



Skills Gap

Potential Up-Skilling Pathways: Automation Example.

Electrical Automation Upskilling

- Health & Safety.
- Lock out Tag out.
- Reading Schematic Diagrams.
- Wiring Circuits from Schematic Diagrams.
- Drawing Schematic Diagrams.
- Control Panels and Components.
- Fault-Finding.

Introduction to PLCs

- Health & Safety.
- What is a PLC.
- PLC Hardware.
- PLC Software.
- I/O Devices used with a PLC.
- Basic PLC Programming.
- Basic PLC Fault finding Techniques.

Introduction to Microcontrollers.

- What is a Microcontroller.
- Basic Electronics.
- Introduction to Low Level Programming.
- Connecting simple I/O Devices.
- Interfacing I/O devices & Microcontrollers.
- Modifying and Adapting Programs.

Electro-Pneumatic Systems

- Health & Safety.
- Reading Schematic Diagrams.
- Connecting Circuits using Schematic Diagrams.
- Drawing Schematic Diagrams.
- Fault Finding.

PLC Controlled Electro Pneumatics

- Overview of an Automated System.
- Wiring I/O Devices to a PLC.
- Designing a Program.
- Writing Programs.
- Monitoring a Program.
- Diagnostics.
- Improving an automated System.

Microcontroller Embedded Systems

- Microcontroller Architecture.
- Microcontrollers Operations.
- Creating Embedded System Projects.
- Modifying and Adapting Embedded Systems.
- Wireless Communication.
- The Internet of Things.

HMI Panels

- Overview of PLC/HMI System.
- Connecting HMI to PLC.
- Using Tags.
- Creating Screens.
- Screen Buttons.
- Screen O/P Visualisation.
- Improving an automated System.

PLC Analogue I/O

- Overview of Analogue & Digital Signals.
- Connecting analogue I/O Devices to a PLC.
- Designing a Program.
- Writing Programs.
- Monitoring a Program.
- Diagnostics.
- Improving an automated System.

PLC Comms, Profinet, OPC-UA

- Overview of Communication Protocols.
- Advantages of M2M Communications.
- OPC-UA.
- MQTT.
- Writing Programs for PLC Communication.
- Diagnostics.
- Improving an automated System.

CPD Upskilling example

Design/Process Personnel

Senior/Line Management

Sales Personnel

TOP FLOOR

Engineering/Maint Personnel

Shopfloor Operators

Quality/Operations Personnel

SHOP FLOOR

CPD Upskilling example

Design/Process Personnel

Senior/Line Management

Sales Personnel

Top-Down View

TOP FLOOR

Engineering/Maint Personnel

Shopfloor Operators

Quality/Operations Personnel

Bottom-UP View

SHOP FLOOR

CPD Upskilling example

Design/Process Personnel

Senior/Line Management

Sales Personnel

Top-Down View

Knowledge Transfer

TOP FLOOR

Engineering/Maint Personnel

Shopfloor Operators

Quality/Operations Personnel

Knowledge Transfer

Bottom-UP View

SHOP FLOOR

CPD Upskilling example

Up Skilling multi-disciplinary "TEAMS"


Design/Process Personnel


Engineering/Maint Personnel

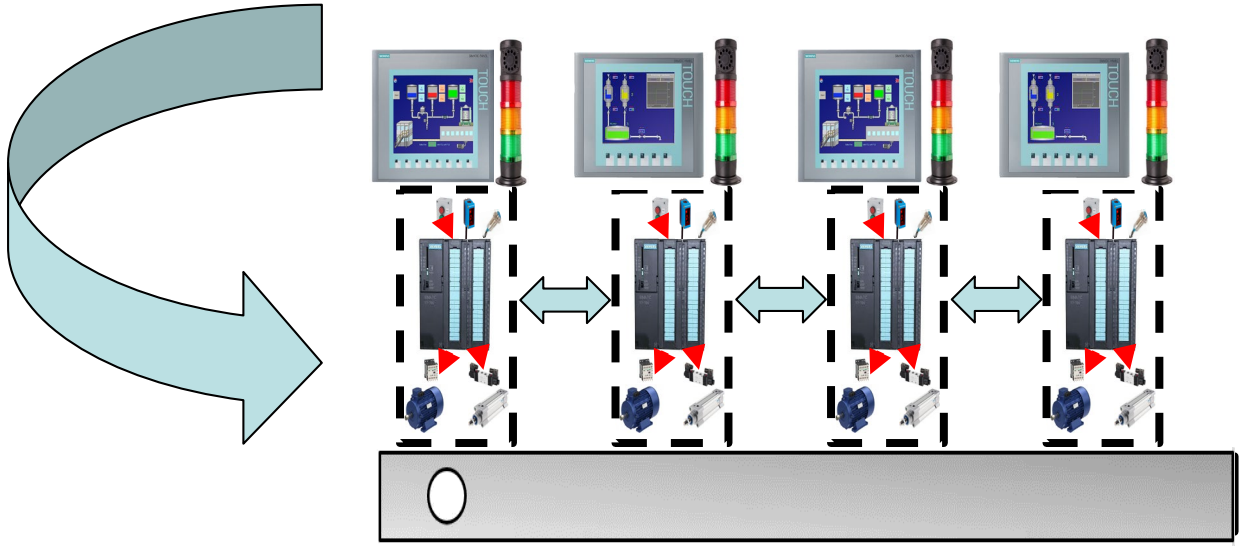

Senior/Line Management


Shopfloor Operators


Sales Personnel


Quality/Operations Personnel

TOP FLOOR & SHOP FLOOR



CPD Upskilling example

Design/Process Personnel

Senior/Line Management

Sales Personnel

TOP FLOOR

Knowledge Transfer

Engineering/Maint Personnel

Shopfloor Operators

Quality/Operations Personnel

SHOP FLOOR

Knowledge Transfer

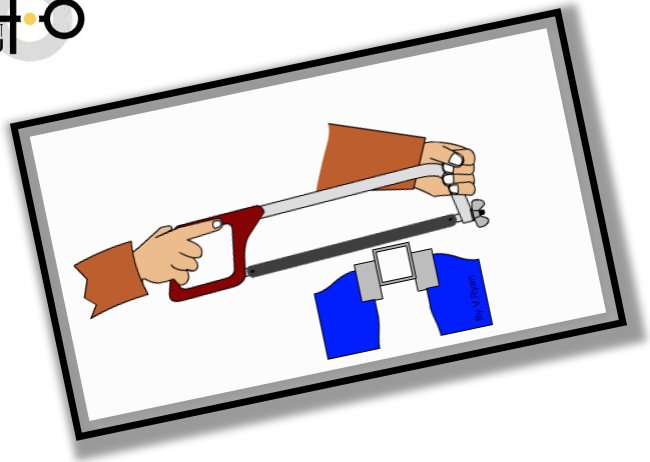
New & Existing Workforce Skills

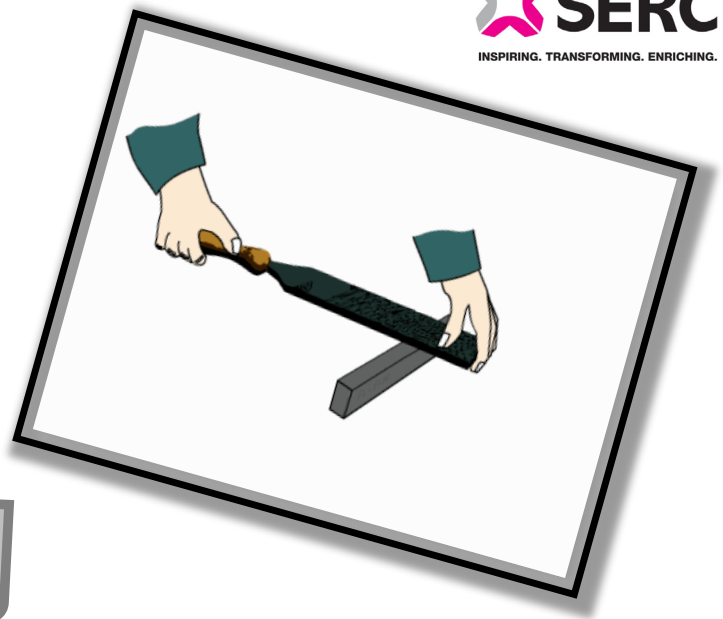
Up-Skilling Existing Workforce

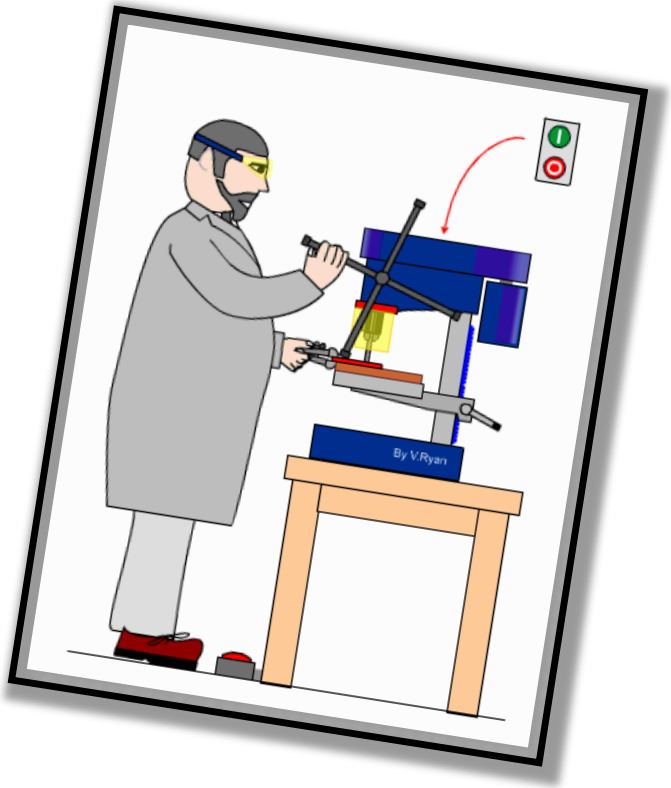
Re-Skilling Existing Workforce

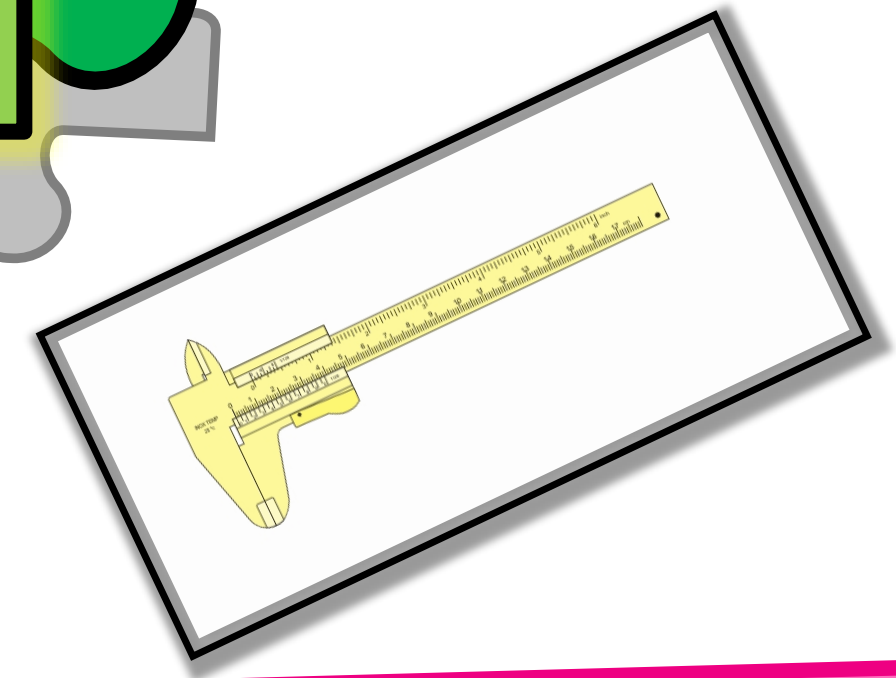
Training New Employees

Basic Engineering Workshop Skills

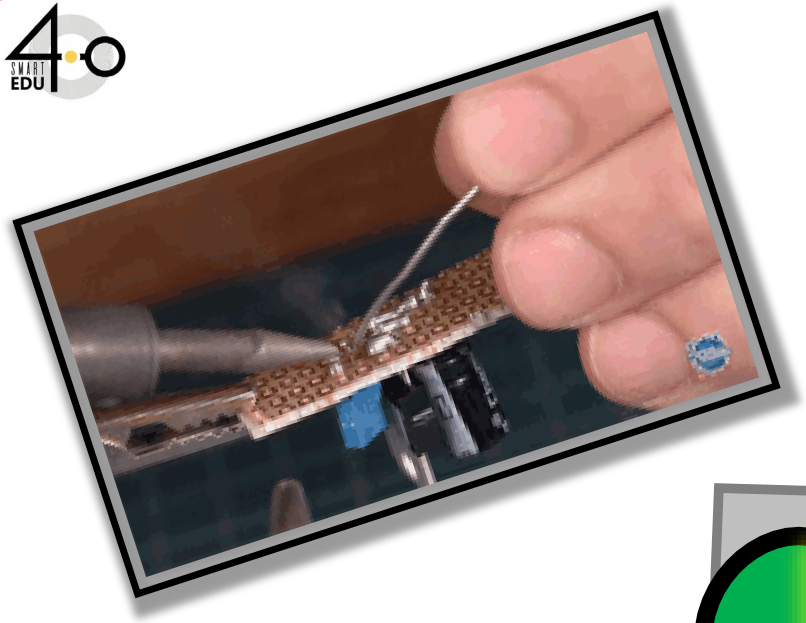


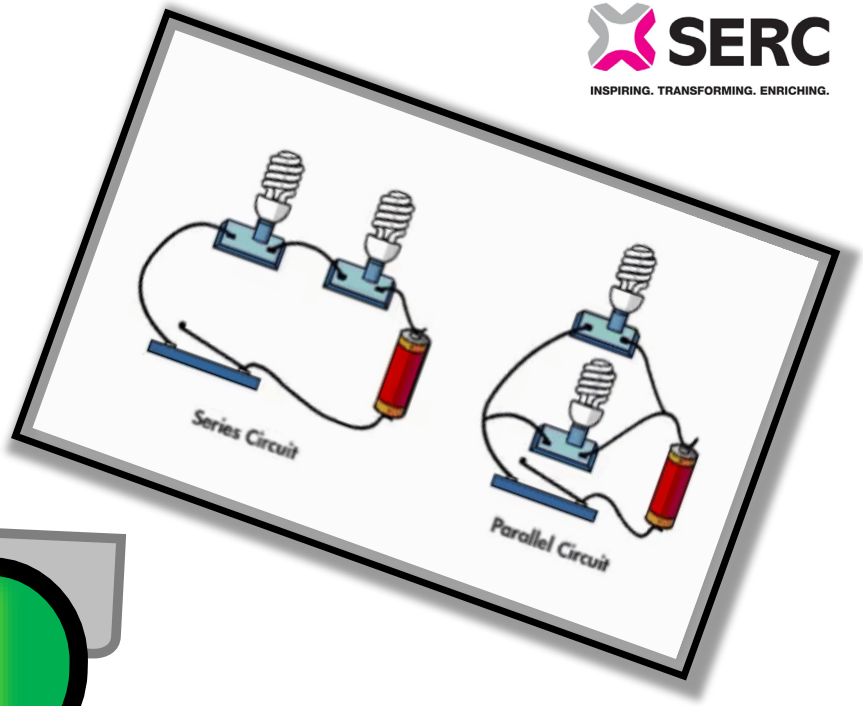


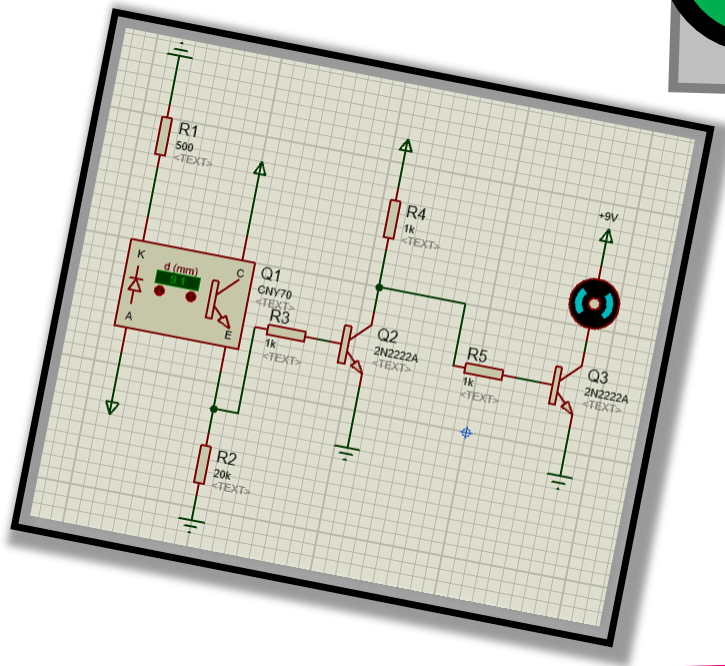


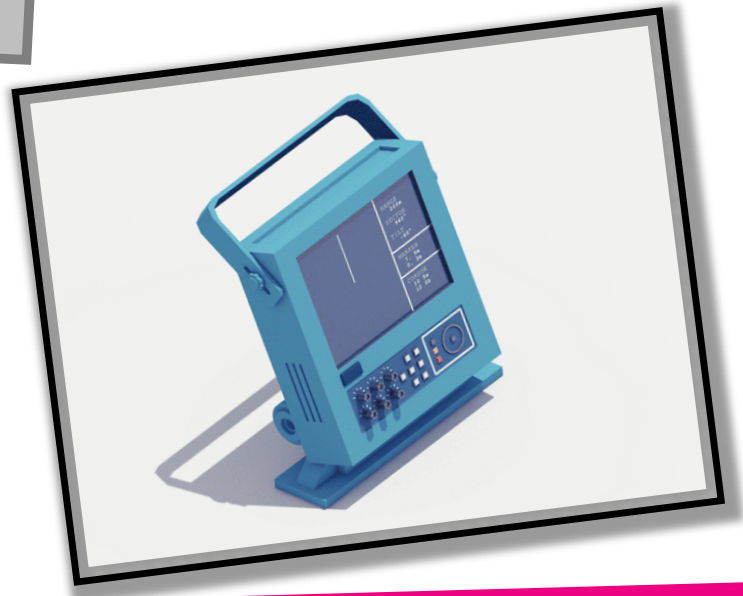


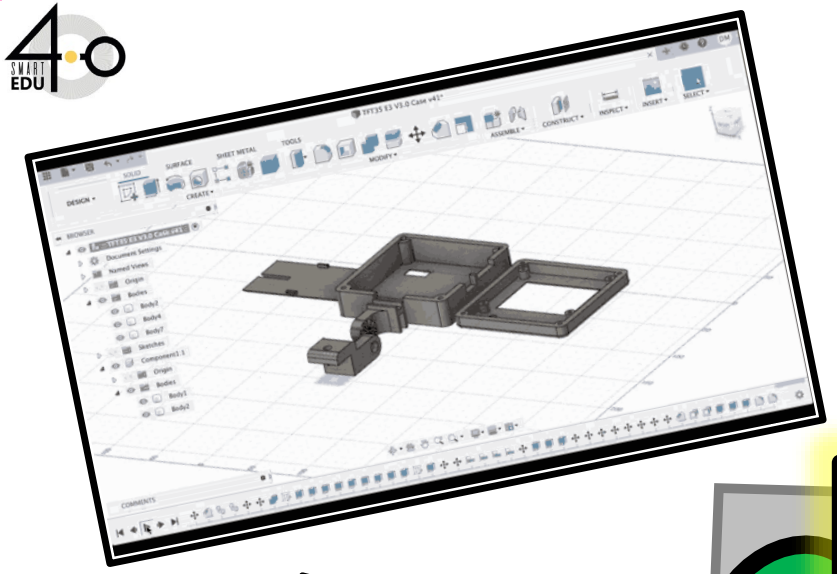
Basic Electronic Skills





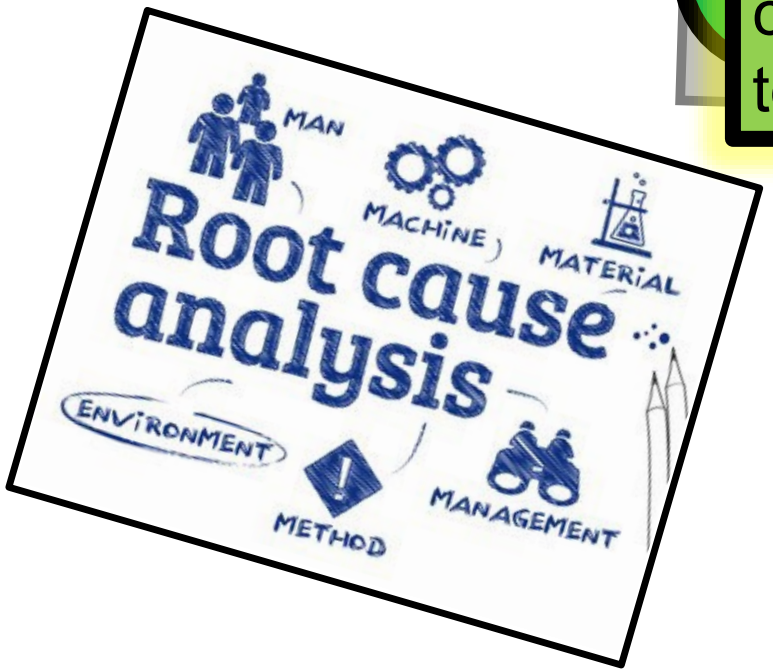


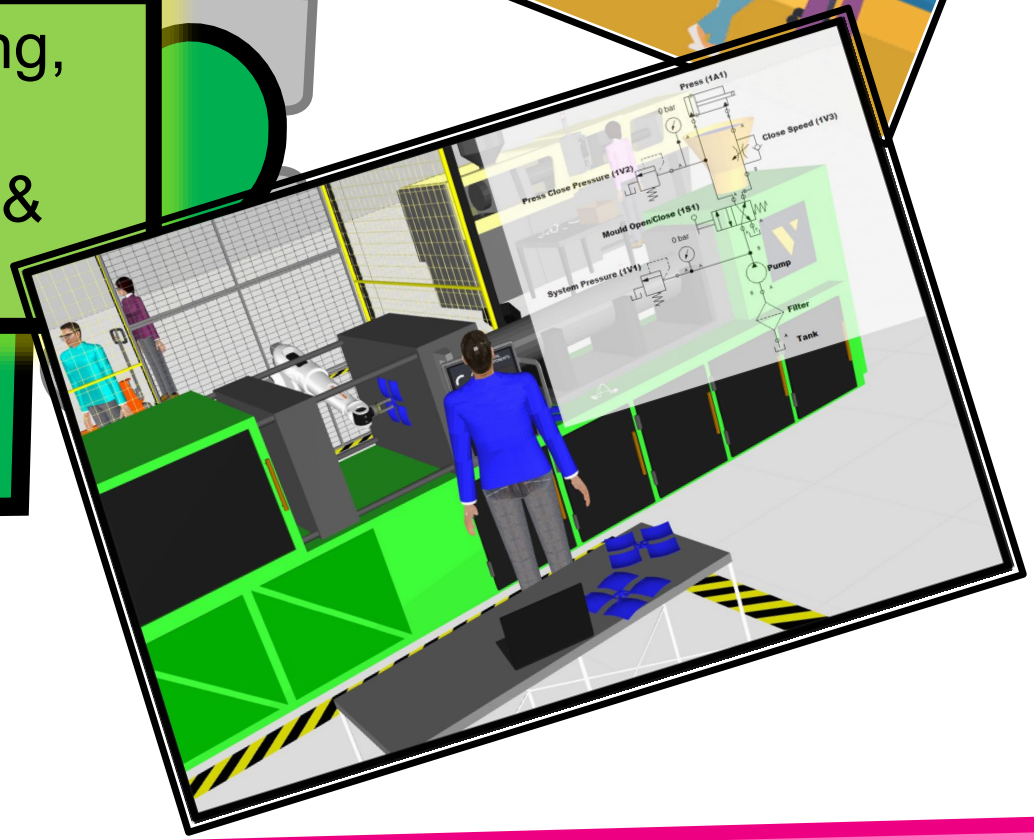




Basic CAD, how are products designed for manufacture, and checked for quality.

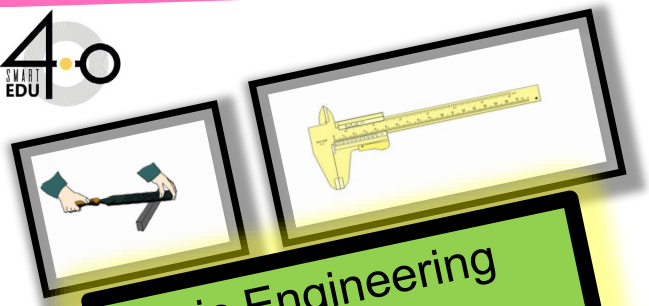
Basic LEAN manufacturing, how a factory flows, continuous improvement & team work.

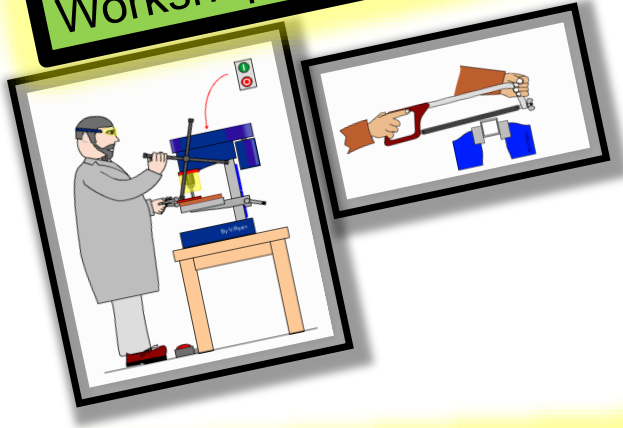




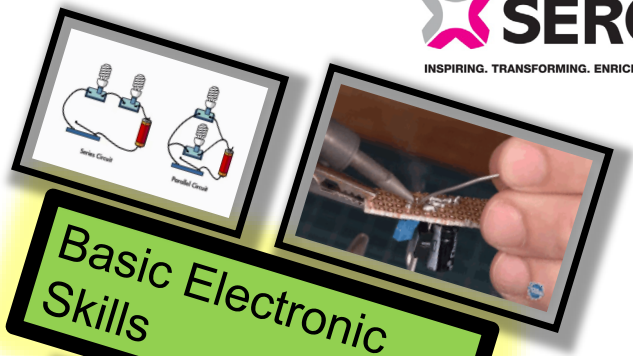
Broad Based Skills

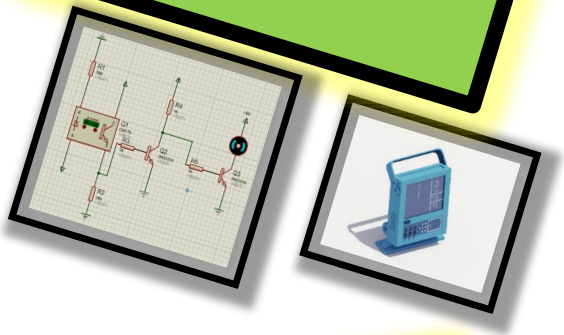
Basic Engineering Workshop Skills



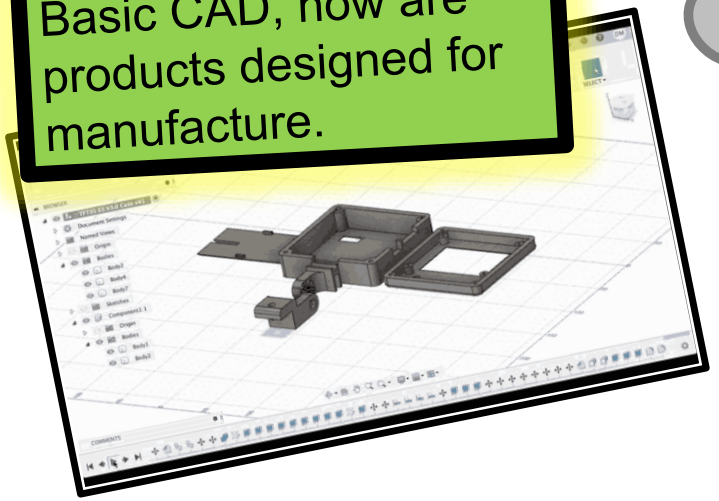


Basic Electronic Skills

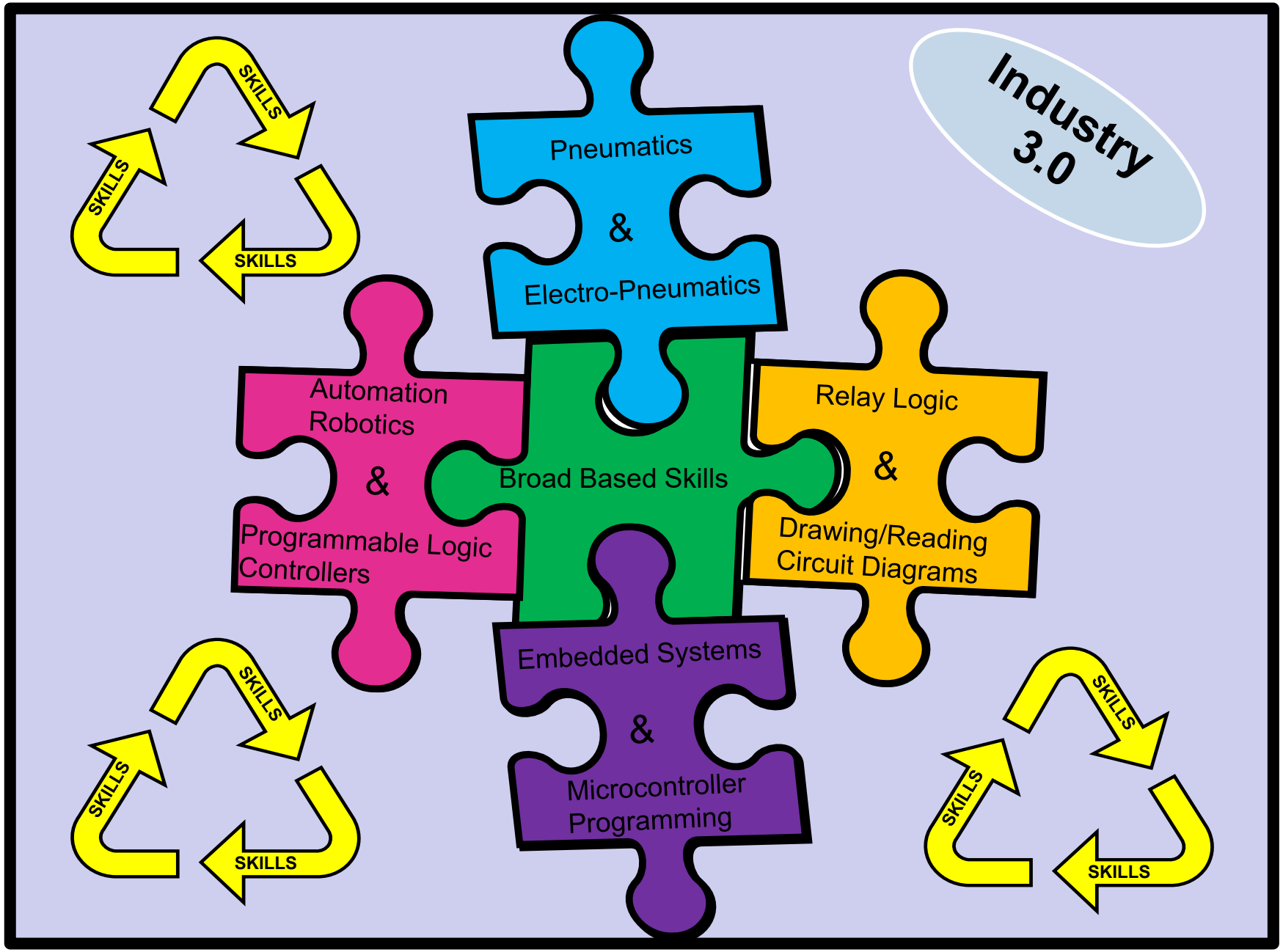


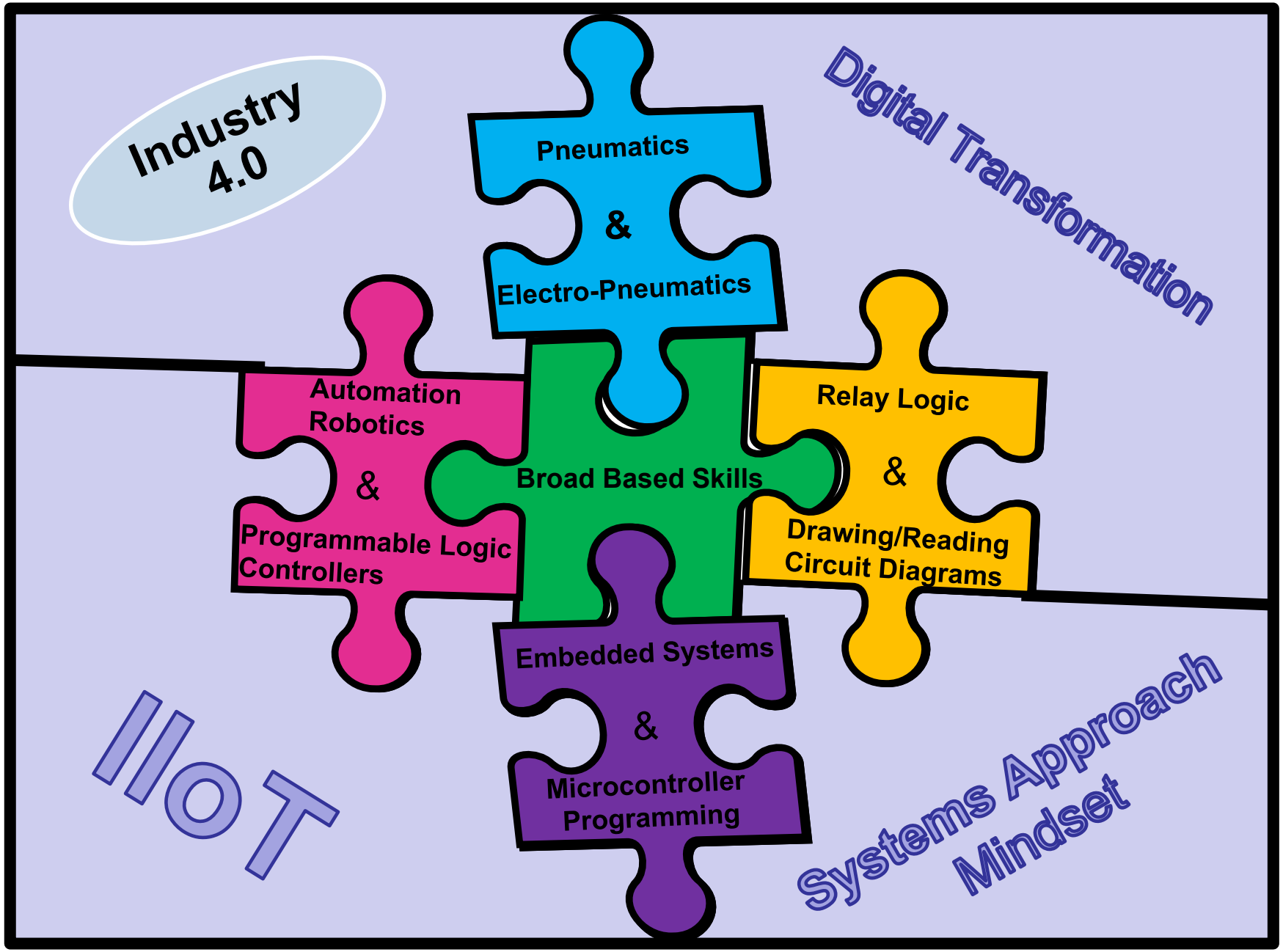


Basic CAD, how are products designed for manufacture.

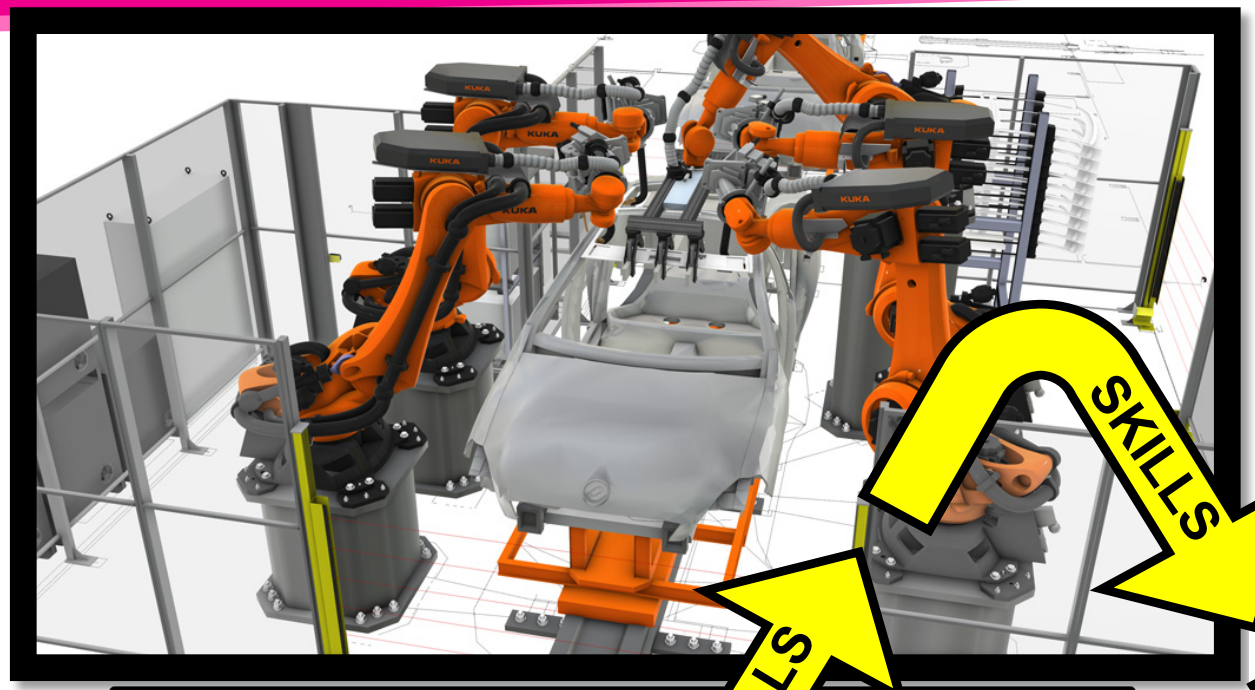


Basic Lean Manufacturing, how a factory flows.


Industry 3.0
Pneumatics
&
Electro-Pneumatics
Automation Robotics
&
Programmable Logic Controllers
Broad Based Skills
Relay Logic
&
Drawing/Reading Circuit Diagrams
Embedded Systems
&
Microcontroller Programming
SKILLS
SKILLS
SKILLS
SKILLS
SKILLS
SKILLS
SKILLS
SKILLS


Industry 4.0
Pneumatics
&
Electro-Pneumatics
Digital Transformation
Automation Robotics
&
Programmable Logic Controllers
Broad Based Skills
Relay Logic
&
Drawing/Reading Circuit Diagrams
Embedded Systems
&
Microcontroller Programming
IIoT
Systems Approach Mindset

Systems Approach Mindset



SKILLS

SKILLS

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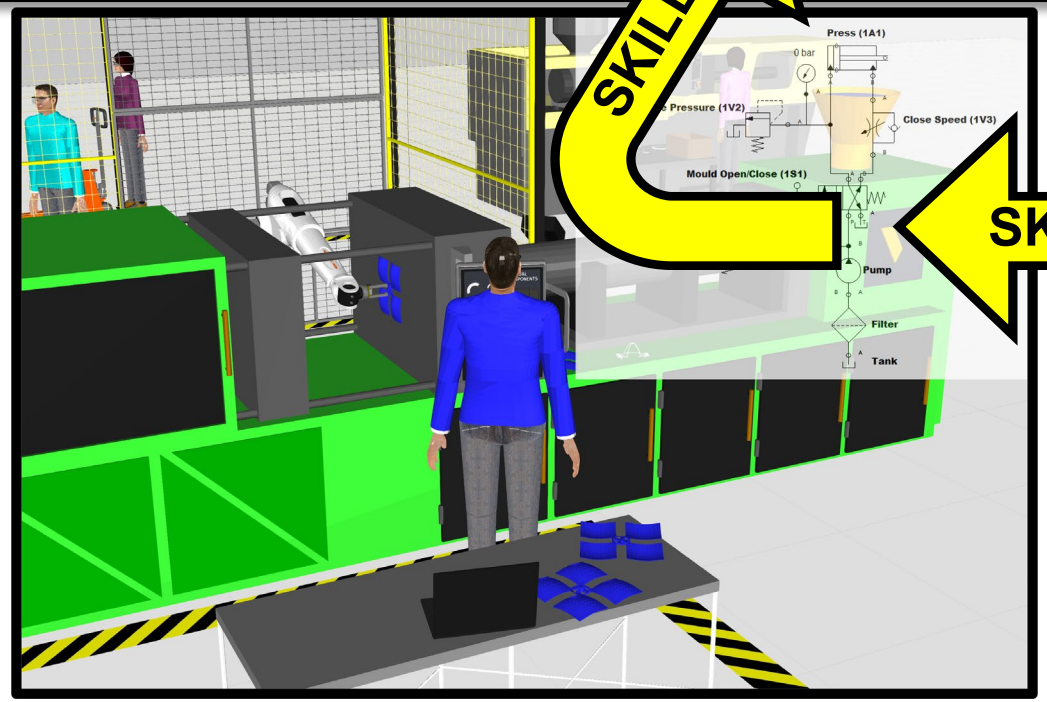

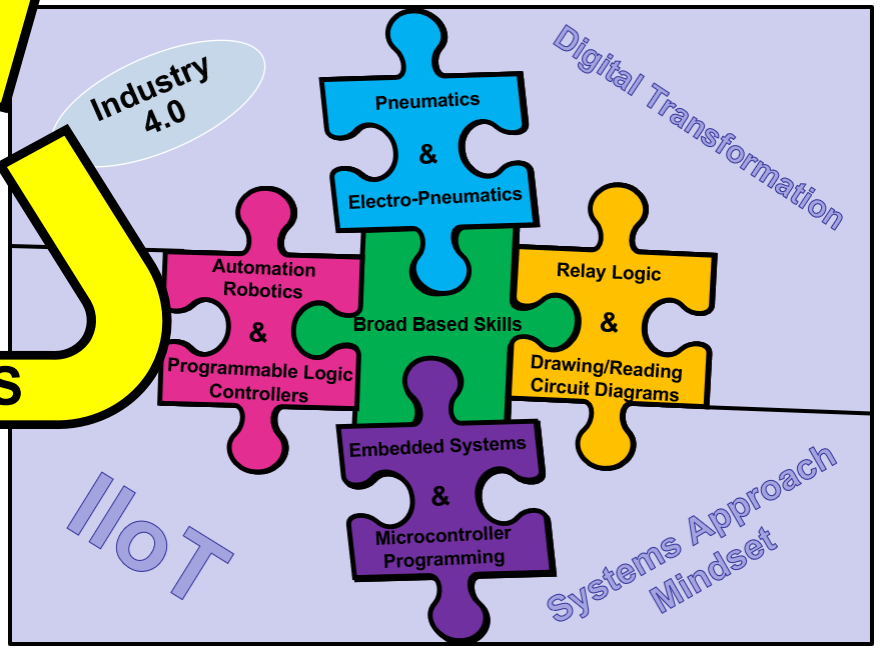

Development of a “Pick & Mix” suite of upskilling modules

Basic Eng. Skills

- Basic Engineering Workshop Skills.
- Basic Electronic Skills.
- Basic CAD/Design Skills.
- Basic Lean manufacturing concepts.

Basic Automation Skills

- Relay Logic, reading schematic diagrams, basic fault finding.
- Basic Pneumatics, Electro-Pneumatics.
- Designing basic Electro-Pneumatic systems.
- Basic Microcontroller & Embedded System programming.

Basic PLC Skills

- Basic understanding of PLCs, where and why they are used.
- Basic PLC programming.
- Basic understanding of different types of sensors, where and why they are used.
- Different types of data that PLCs and sensors can generate.

SMART EDU 4.0

SERC
INSPIRING. TRANSFORMING. ENRICHING.

Thank you.