Industry 4.0 – Impact on Leather Sector

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URs Productively- India

Agenda

- The Evolution
- Key Themes of Industry 4.0
- Principles of Industry 4.0
- Core approaches of Industry 4.0
- Context of Industry 4.0
- Impact on Leather Sector
- Way Forward For Leather Sector

Evolution

Industry -1.0
Manufacturing based on steam engine Replacing Human labor

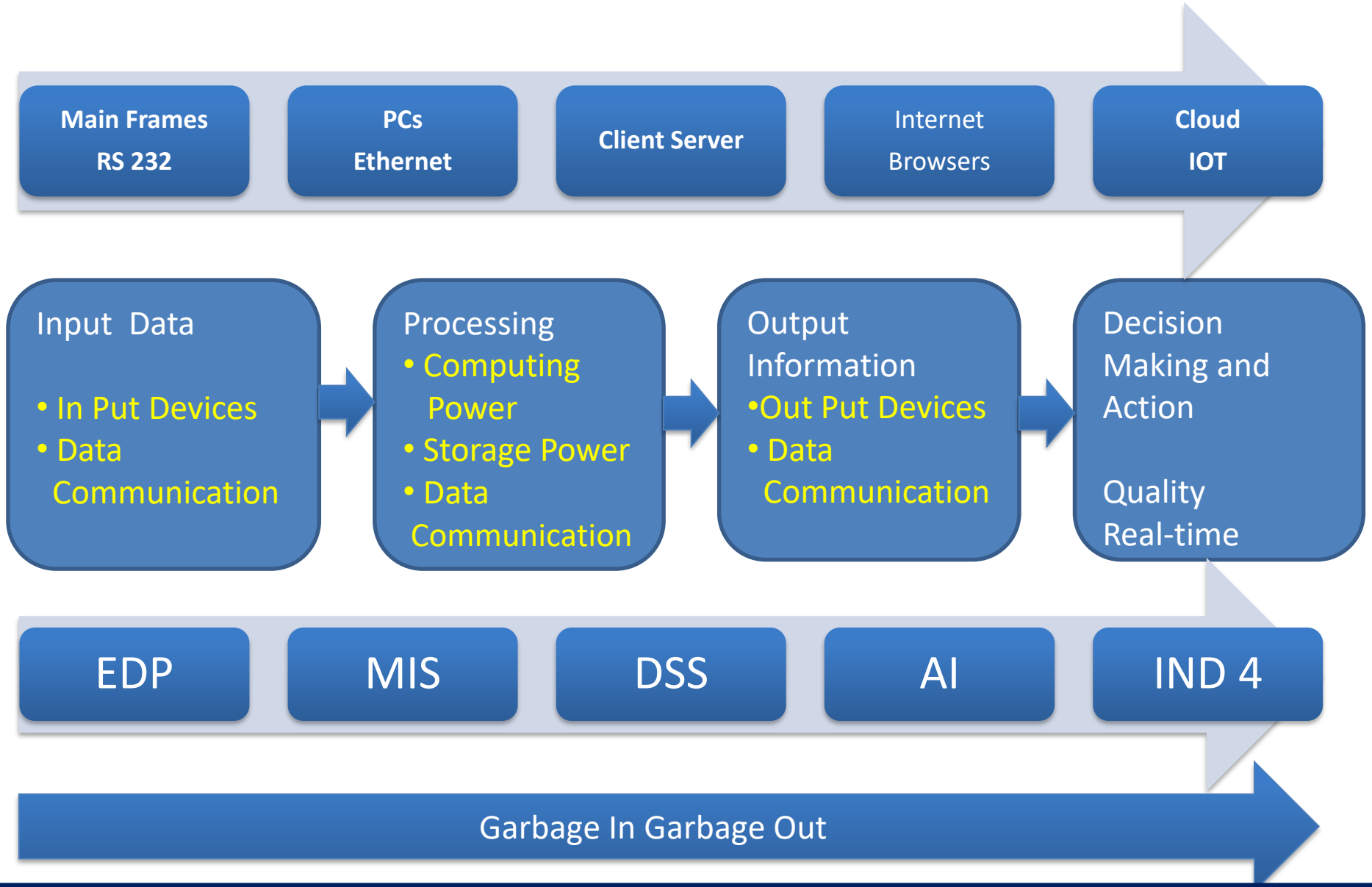
Industry -2.0
Electrically Powered Mass Production
Division of Labor
Conventional Machines

Industry -3.0
1969 – Today
Electronics
PLCs
CNC Machines
IT
Automated Manufacturing
Mechatronics

Industry -4.0
Today-
Manufacturing Based on
CPS – Cyber Physical - Systems
ICT
IOT
IOS
IOD

Industry -1.0 1754 - 1870	Industry -2.0 1870-1969	Industry -3.0 1969 - Today	Industry -4.0 Today-

Phenomenon Of Evolution - 3---->4



Potential To Improve

- Productivity and competitiveness
- Increase energy and resource efficiency effectiveness
- Contribute To Environment
- Enable the transition to a circular economy
- Enable industrial economy in which end of life products are reused, remanufactured and recycled
- Contribute Sustainable production consumption patterns
- Provide opportunities for developed and developing countries to achieve economic growth and sustainable development

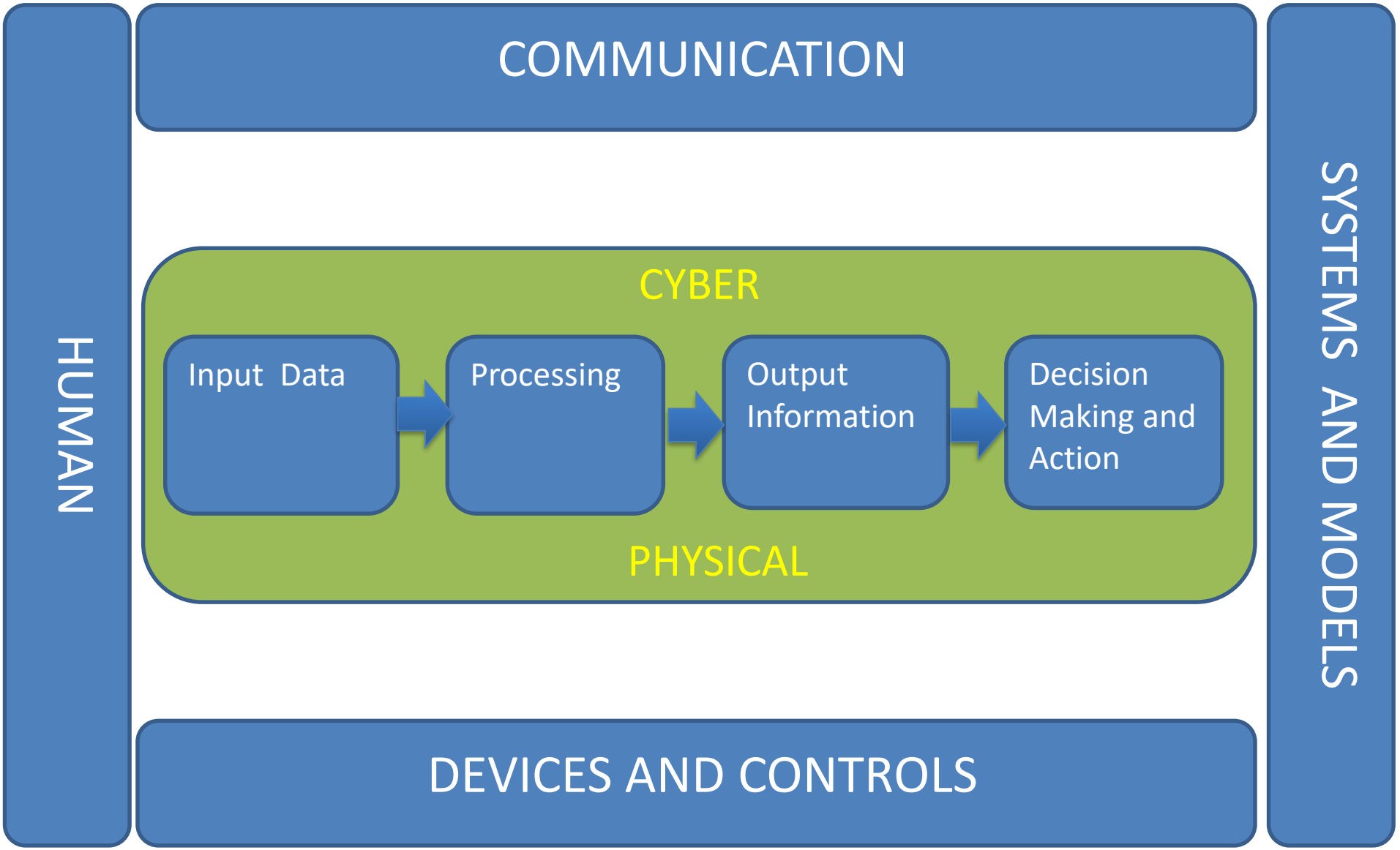
The Key Theme of Industry 4.0

- Cyber-Physical Systems (CPS)
- Internet Of Things (IOT)
- Internet Of Services (IOS)
- Internet of Data (IOD)

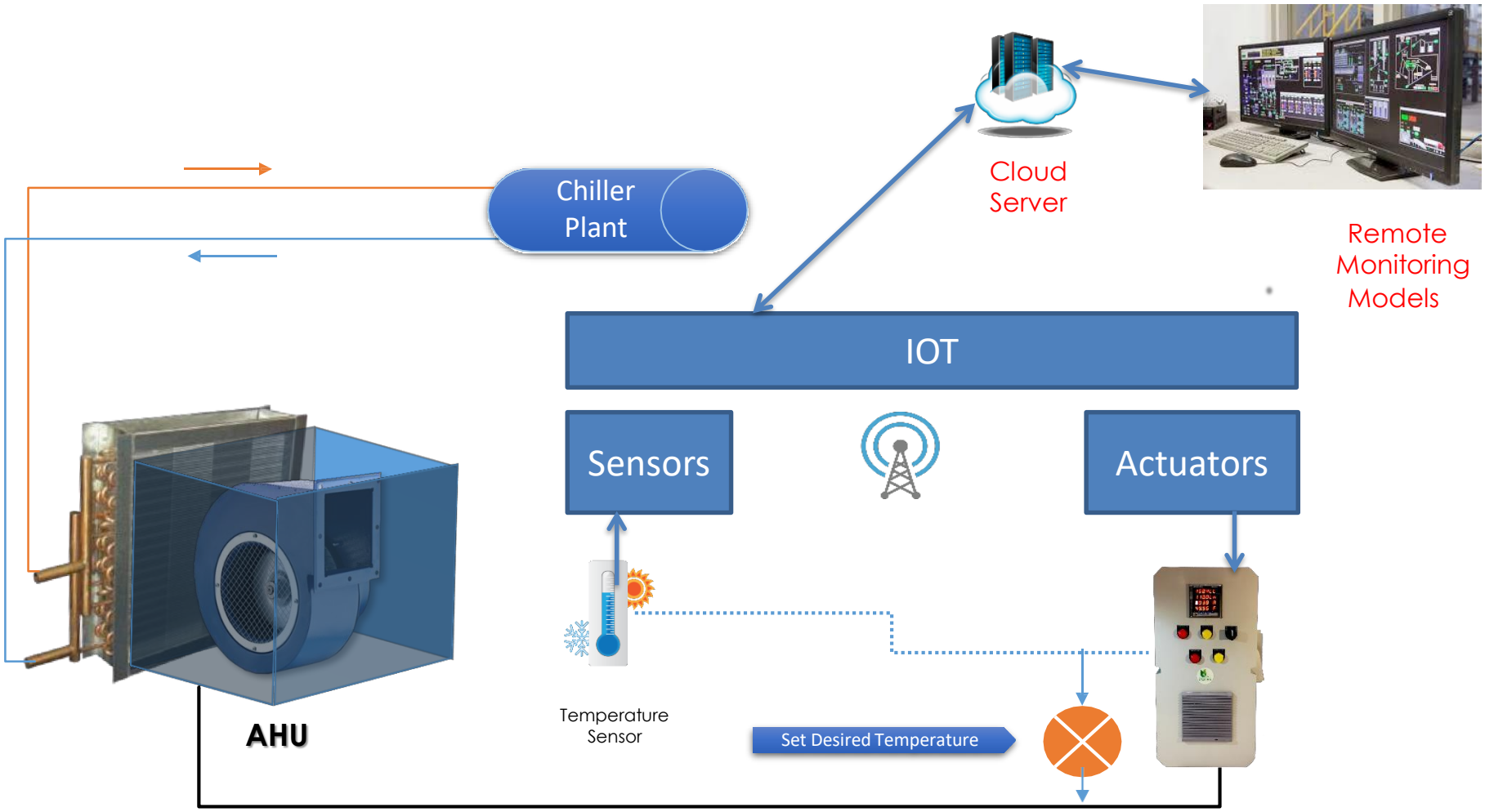
Cyber-Physical Systems

- **Cyber-Physical Systems (CPS)** comprise interacting digital, analog, physical and human components engineered for function through integrated physics and logic.

Cyber-Physical Systems - The Key Theme of Industry 4.0



CPS and IOT

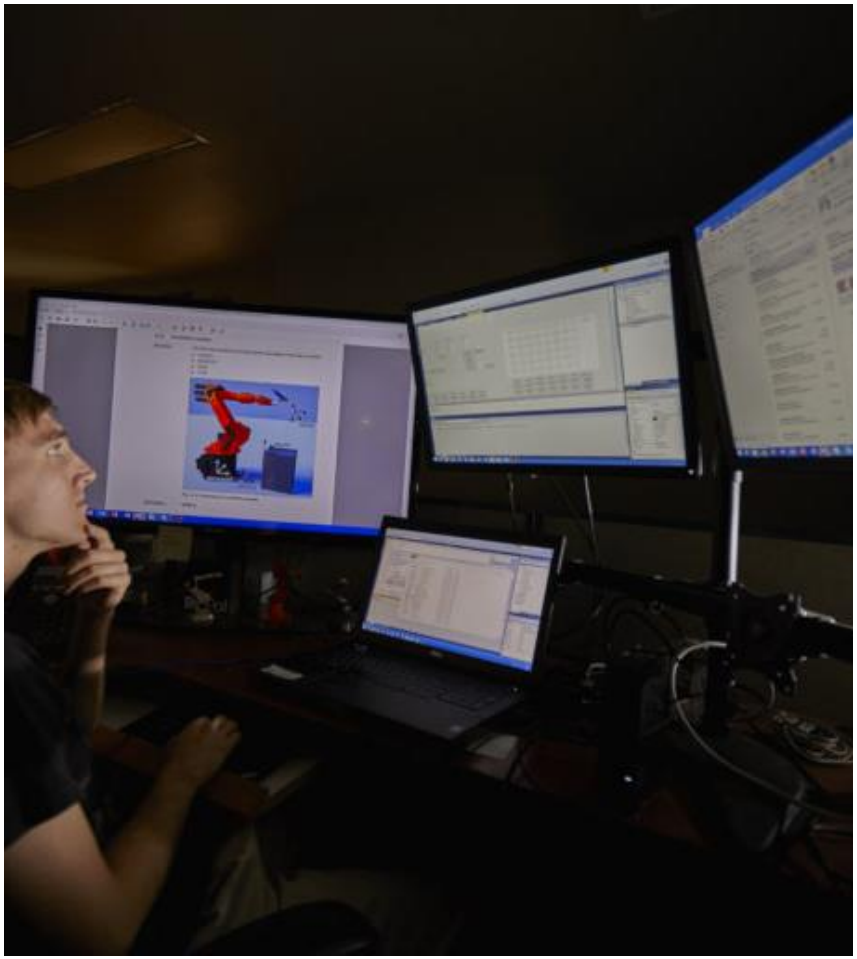

Chiller Plant
Cloud Server
Remote Monitoring Models
IOT
Sensors
Actuators
AHU
Temperature Sensor
Set Desired Temperature

Internet of Things – IOT

Internet of Things :

- Basically Data communication
- Devices such as Wifi, Blue Tooth
- Can identify and connect to physical objects with IP addresses and work with CPS

Inter Net of Services– IOS



Inter Net of Services :

- While IOT, senses and provides Big Data
- Internet of Services focuses on and delivers the required business value from the **Internet** of Things
- By incorporating models and business analytics.

Internet of Data - IOD

Internet of Data :

- Manage and maintain data and data security
- Integrate product and production data (Advanced PDM)
- Resource for Big Data Analysis

Principles of Industry 4.0

- **Interoperability**: Cyber Physical Systems – Systems, People and and Technology have to connect and communicate with each other via sensors and IOTS. It is important for companies and people to communicate with CPS – for which adequate standards have to be established.

- **Virtualization**: Simulation models can create virtual factory flows by linking sensor data (from monitoring physical processes) Mapping the virtual and real world

- **Decentralization**: **cyber-physical systems** , IOT and IOS can enable decision making at cell levels and machine level and need for centralization is minimized

Principles of Industry 4.0

- **Real-Time Capability**: For organizational tasks the capability to collect and analyze information/data real time using business models.

- **Service Orientation**: offering of services via the **Internet of Services - IOS**

- **Modularity**: Individual modules and Modularization of systems that are flexible to changing contexts

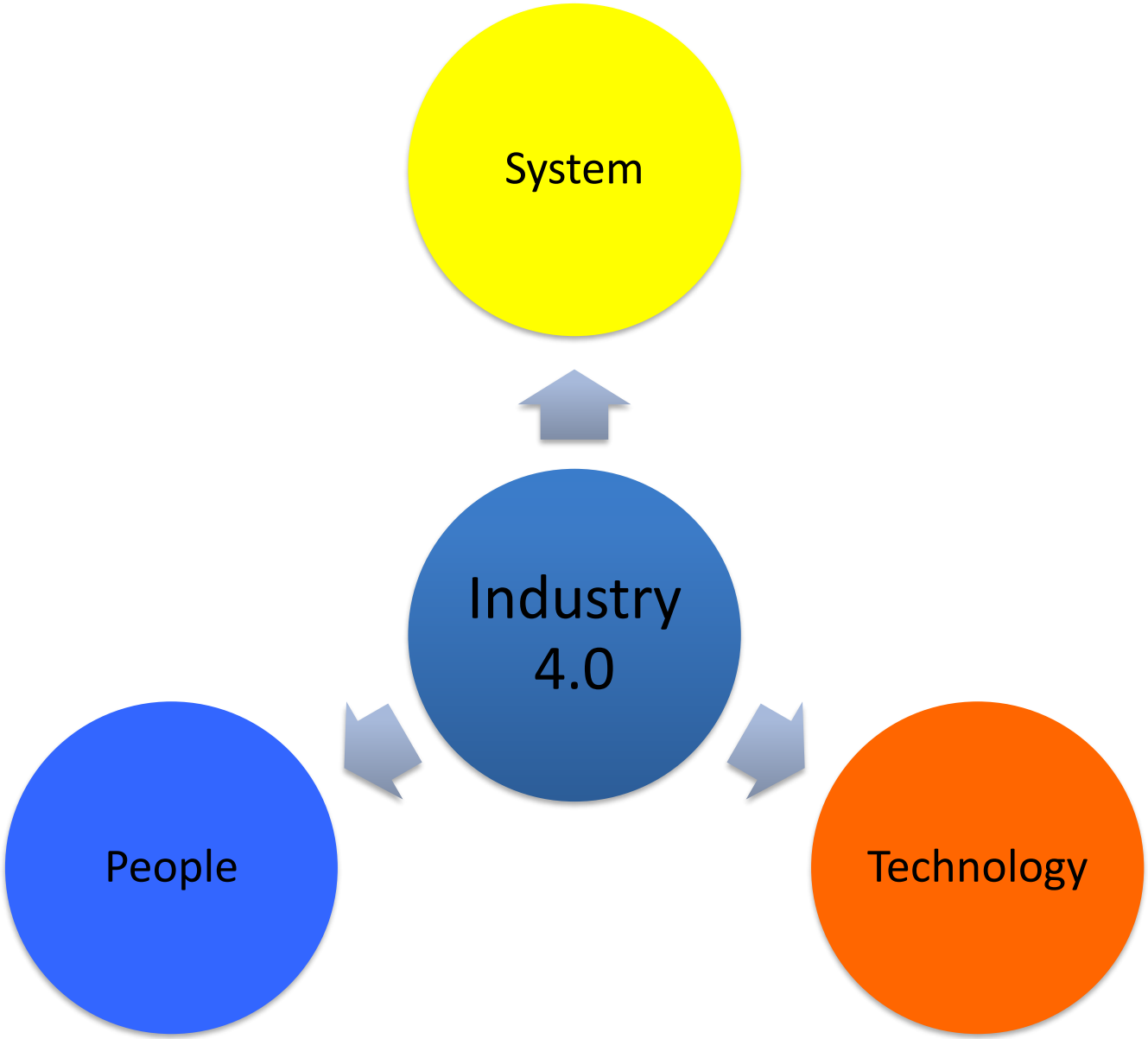
Core Approach : Modular Work Systems

- One of the core approaches of Industry 4.0 is to develop modular and self- configuring plug-and-work systems
- To enable different product and process configurations
- With distributed embedded intelligence it has flexibility and autonomy and can respond quickly to the demands and market restrictions.
- It means that small batch production at low costs gives the possibility to match demands without Scale

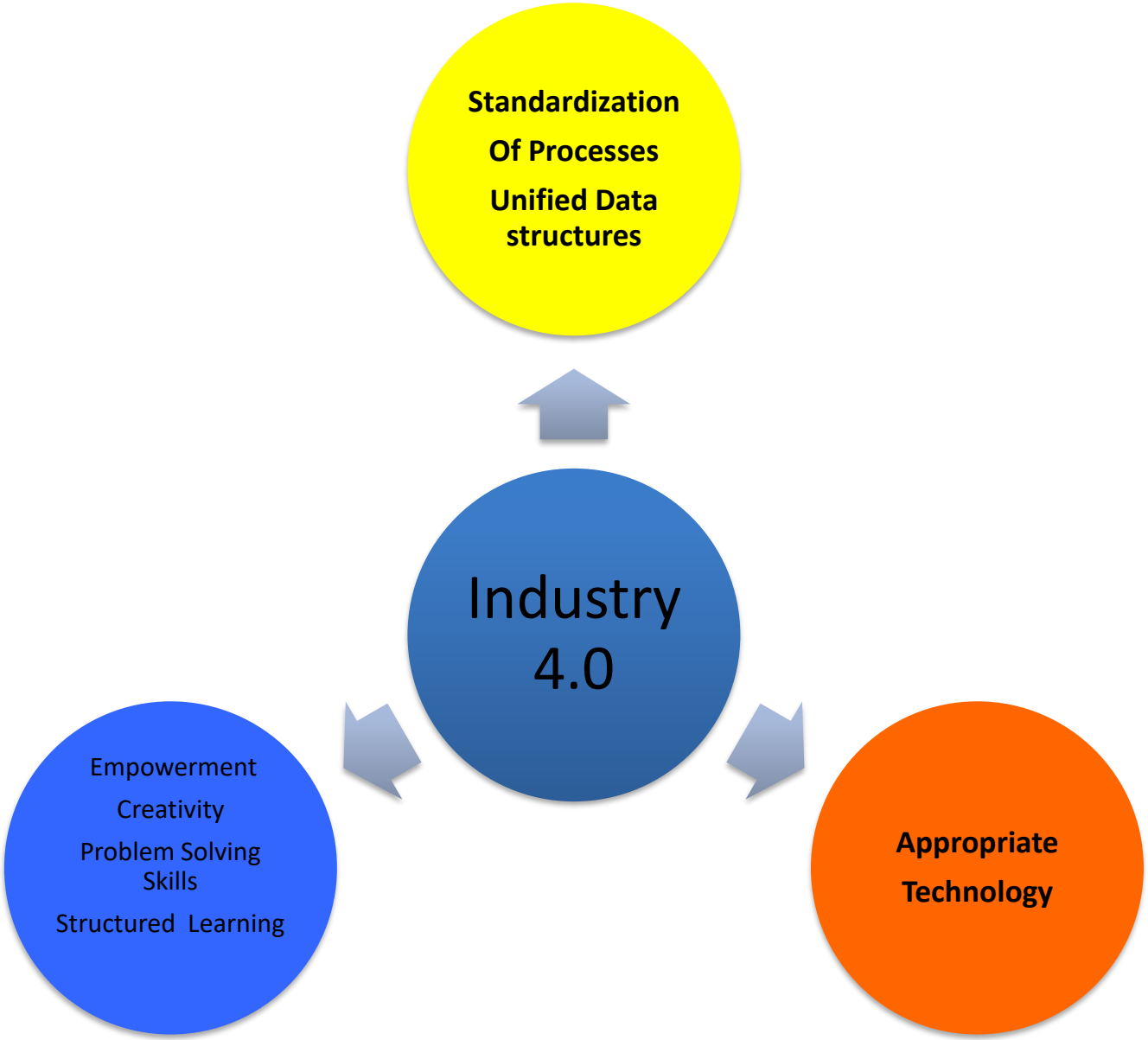
Core Approach: Servitization

- In essence servitization is a transformation journey
- It involves firms (often manufacturing firms) developing the capabilities they need to provide services and solutions that supplement their traditional product offerings
- The idea of a product-service system - "an integrated product and service offering that delivers value in use”
- Servitized organization - designs, builds and delivers an integrated product and service offering that **delivers value in use**

Context of Industry 4.0



Context of Industry 4.0



Investments

- Industry 4.0 implementation requires investments
- Not just at corporate but also at government level
- Despite the cost reduction of IT and electronics, other costs related to equipment substitution, infrastructure and education will be part of the total investment.
- The trade-offs between investments and gains to be considered

Impact on Leather Sector

- The leather sector in India has consistently adapted to the customers product and system needs as well. Customers embarking on Industry 4.0 will have a priority of digitizing the supply chain with the following requirements and more:
- Collaborative Design and Concurrent Engineering
- Predictive Maintenance
- After Sales Service
- Data Enhanced Products
- Globally Visible Production
- Environmental and Compliance status

Potential Application In Leather Sector

Industry 4.0 - Potential application in Leather Sector						
	Customer	Design	Procurement	Production	Quality	Maintenance
Interoperability		Concurrent Engineering		Production data form Sub Contractors and to customers		
Virtualization		Concurrent Engineering	Concurrent Engineering	Simulation Modeling		
Decentralization	Restructure Based on Customer Focused End-to End Operation		Order from Modules	Modular Production Cells		
Real-Time Capability	Sustainability Reporting			Modular Production Cells	Big Data Drive Quality Management	Predictive Maintenance
Service Orientation	Post sales Service					
Modularity				Modular Production Cells		

Way Forward For Leather Sector

- Prepare a 5 year Road Map for Industry 4.0
- Enable Sector Level Initiatives for Industry 4.0 (COE)
- Understand customer needs and processes aligning with Industry 4.0
- Business process management and data acquisition policy
- Assess Skill level requirements
- Inclusive approach with Supply Chain

The Last Word

Make Industry 4.0 Systems

USEFUL

And

USEABLE

Thank YOU

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