# Industrial Automation

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CLIENTS IN 175+
CITIES IN 6 CONTINENTS

170,000 +
WORKFORCE

USD 21Bn $
MARKET CAPITALIZATION

# Wipro Group

## Wipro Enterprises (P) Limited

**Wipro Limited**

| INFRASTRUCTURE ENGINEERING | AUTOMATION SOLUTIONS | ADDITIVE MANUFACTURING | CONSUMER CARE & LIGHTING | IT SOLUTIONS & SERVICES |
|---|---|---|---|---|
| **Wipro Infrastructure Engineering** | **WIN Automation** | **Wipro3D** | **Wipro Consumer Care & Lighting** | **Wipro Technologies** |

**Wipro Infrastructure Engineering**

- HYDRAULIC CYLINDERS
- TRUCK HYDRAULIC SOLUTIONS
- AEROSPACE
- WIPRO WATER

**WIN Automation**

- FACTORY AUTOMATION
- SMART FACTORIES
- SMART PRODUCTS
- SMART SENSORS

**Wipro3D**

- ADDITIVE MANUFACTURING

**Wipro Consumer Care & Lighting**

- PERSONAL CARE
- BABY CARE
- WELLNESS PRODUCTS
- LIGHTING FURNITURE AND SWITCHES

**Wipro Technologies**

- IT
- BPO
- R&D SERVICES
- CONSULTING SERVICES

# Industrial Automation Landscape
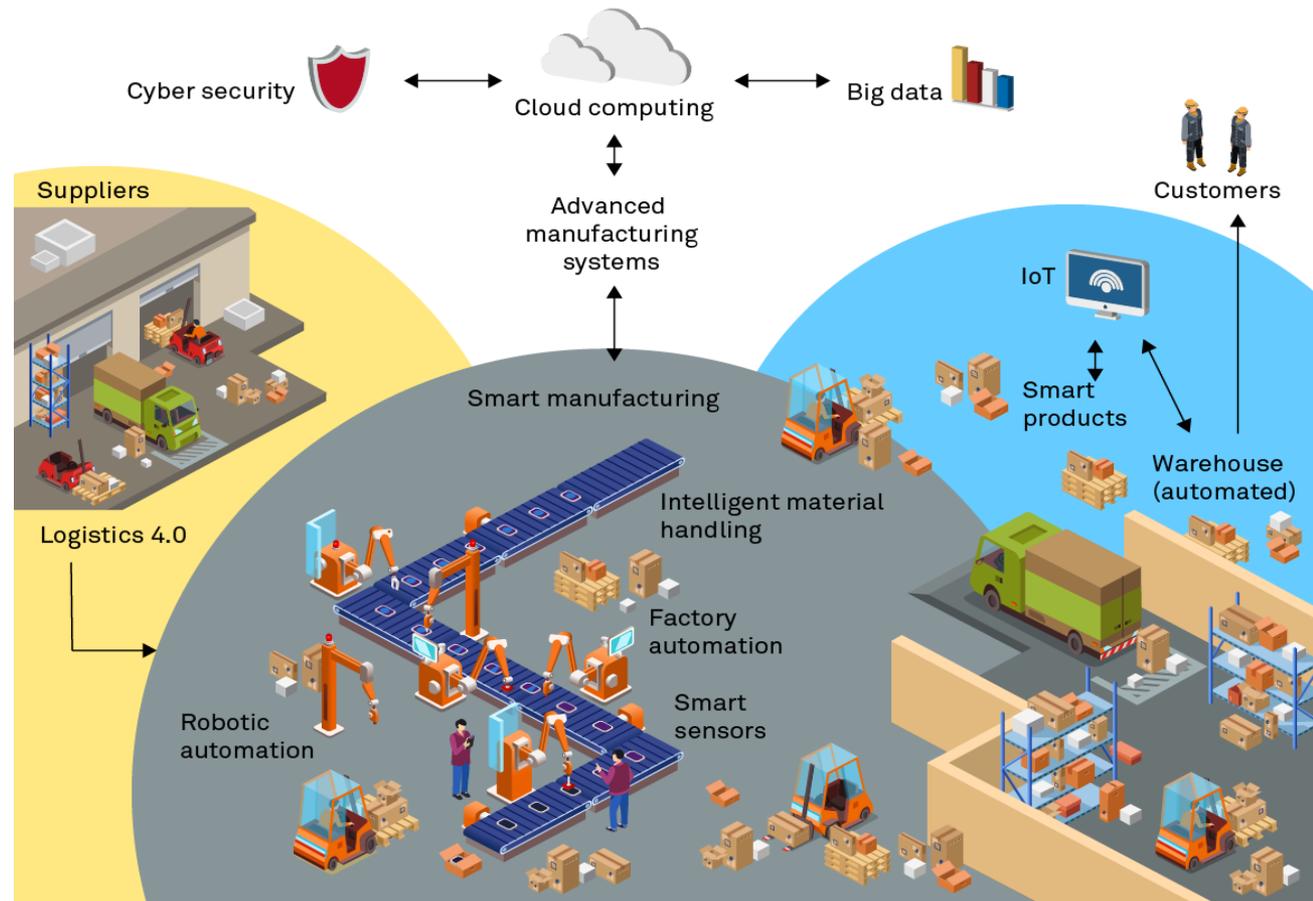
# Automation evolution



Wipro's capabilities range across Industry 2.0 to Industry 4.0 solution implementations
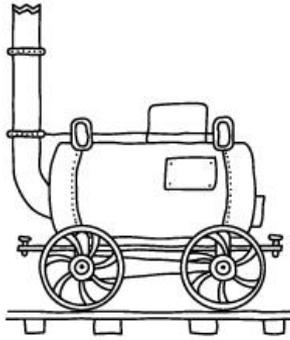
1800s      1900s      2000s

**Industry 1.0**
The Industrial Revolution begins. Mechanization of manufacturing with the introduction of steam and water power
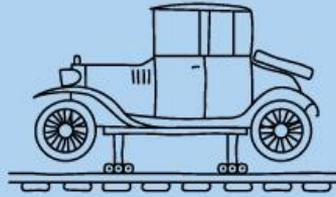
**Industry 2.0**
Mass production assembly lines using electrical power
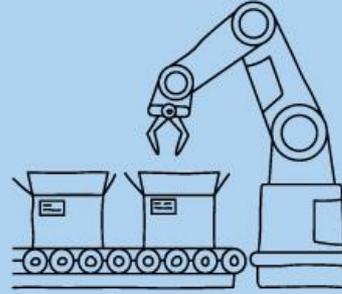
**Industry 3.0**
Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics

**Industry 4.0**
The 'Smart Factory'. Autonomous decision making of cyber physical systems using machine learning and Big Data analysis. Interoperability through IoT and cloud technology.

# Automation statistics

## Current Automation Rate: Industrial Robots/1,000 Workers (2013)

| Country | Robots/1,000 Workers | Category |
|---|---|---|
| Republic of Korea | 490 | The Leaders |
| Japan | 330 | The Leaders |
| Germany | 225 | The Leaders |
| USA | 140 | The Aspirers |
| France | 125 | The Aspirers |
| Australia | 75 | The Aspirers |
| United Kingdom | 60 | The Aspirers |
| China | 23 | The Laggards |
| Brazil | 8 | The Laggards |
| Russian Federation | 3 | The Laggards |
| India | 3 | |

58
(Global Average)
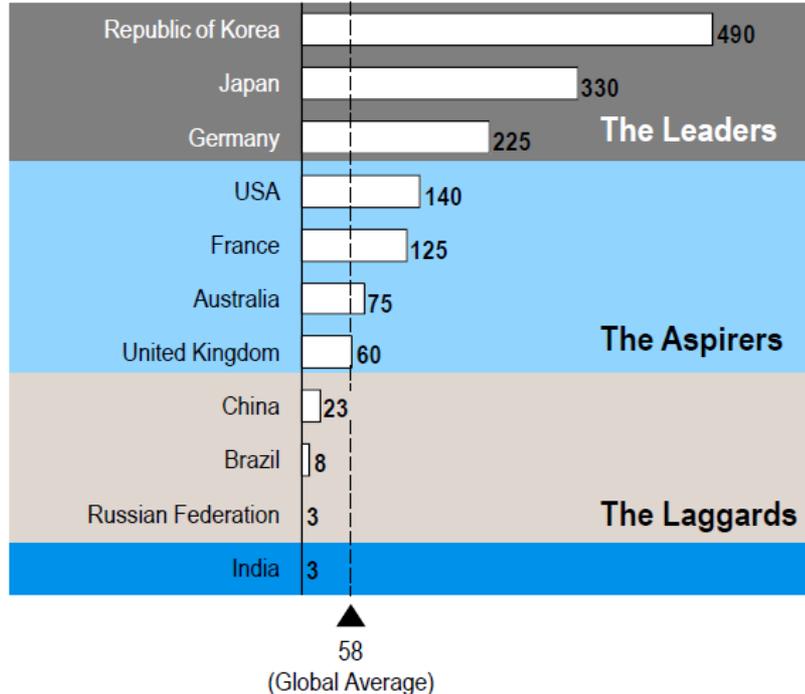
## Comments

> Industry 4.0 is – besides other challenges – seriously threatening India's position as a low-cost country

> With increasing digitalization of the manufacturing Industry in the Triad, cost advantage through availability of cheap labour vanishes

> Low automation rate shows that India is not ready for Industry 4.0 yet – urgent changes are needed

> India needs to reposition itself, and go beyond current efforts to focus on 'Make in India'

# Market segments and Automation penetration
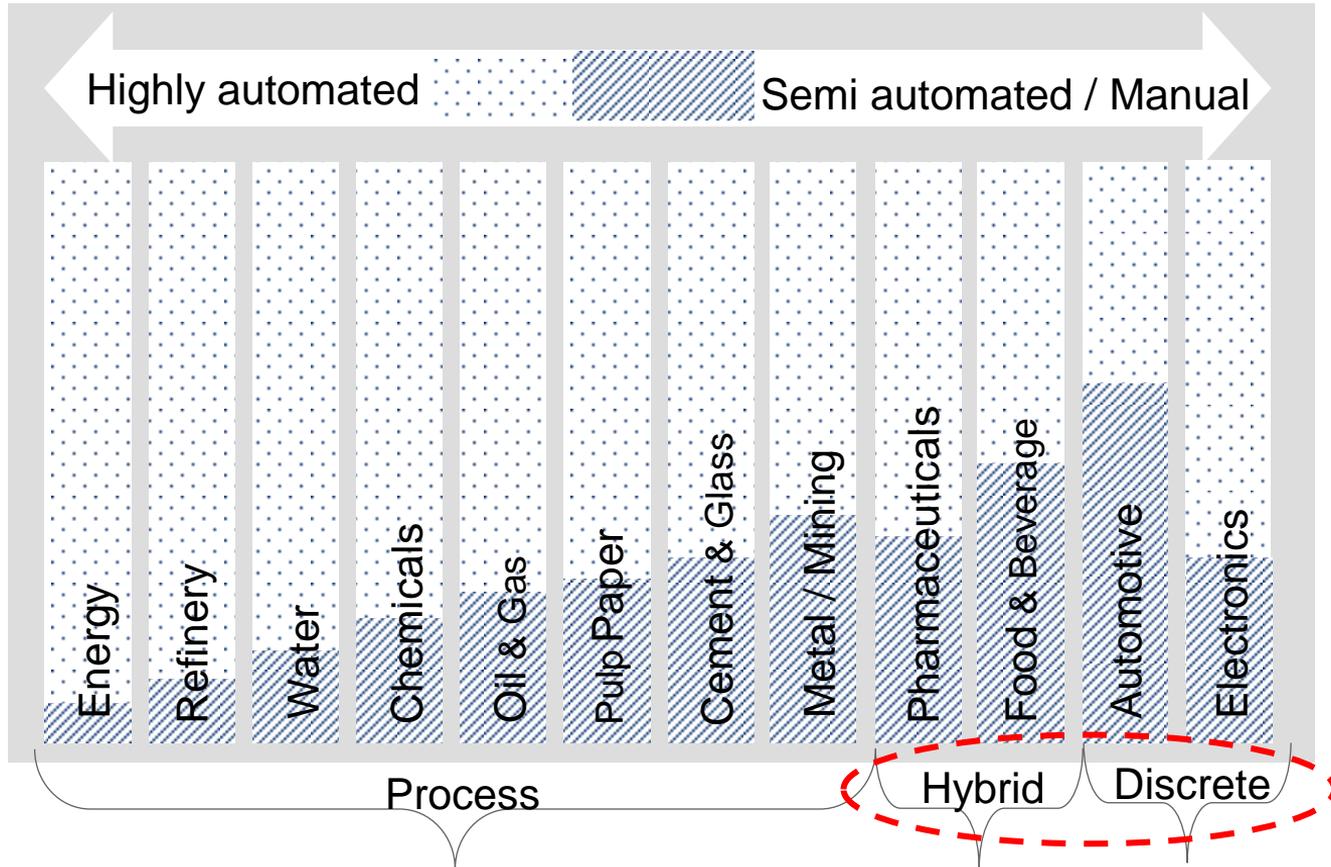
# Automation Value Chain
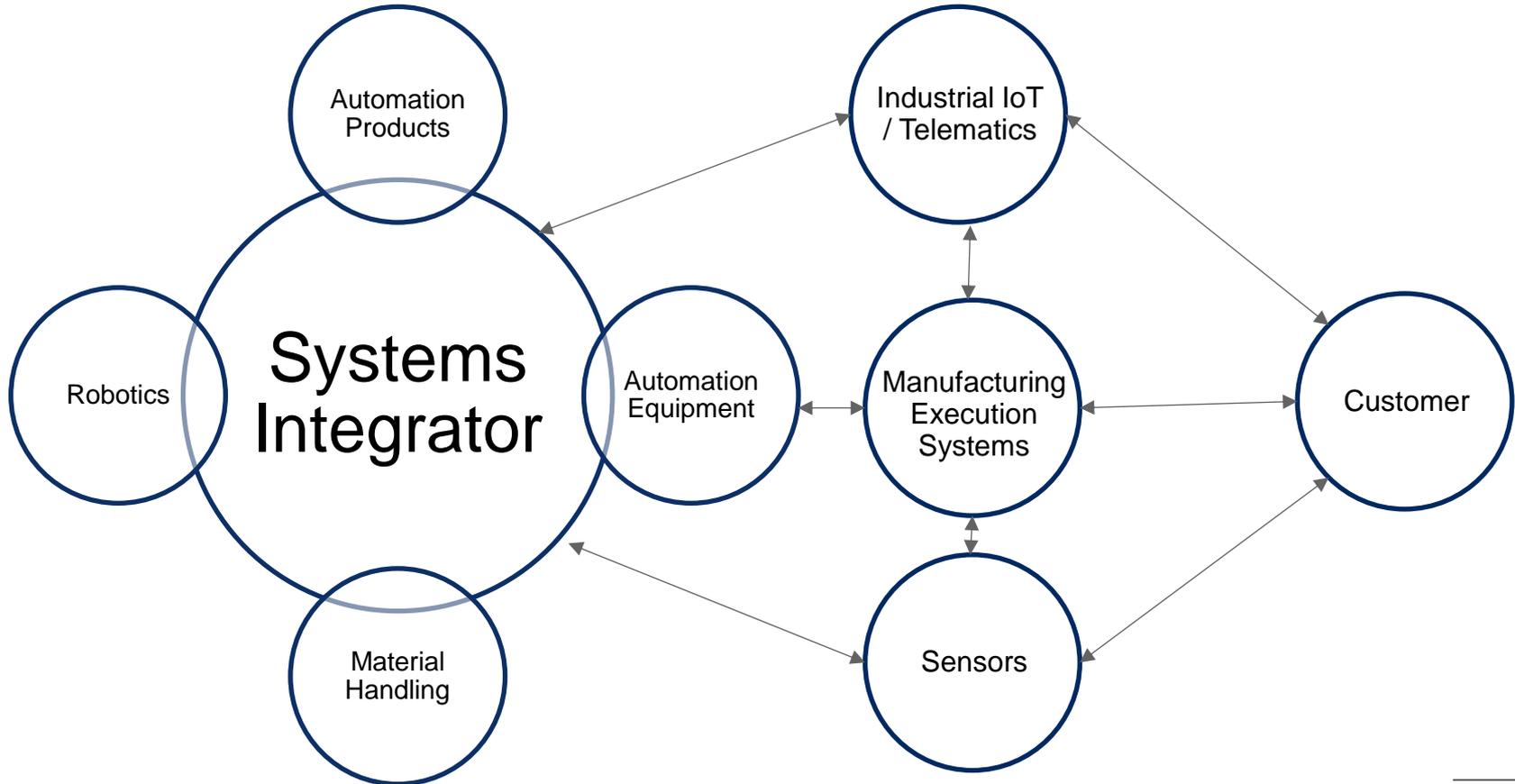
# Factory Automation elements

## Automation hardware

- PLC and HMI based solutions, SCADA systems, DCS solutions
- Turnkey automation projects

## Robotics

- Design & implement robotic automation solutions
- Deliver optimal cost, reliability, ergonomics & safety
- Solutions based on 6/7 axis, SCARA, cartesian robots, vision systems, cobots, AGVs

## Material Handling

- Design, supply and integrate suitable intelligent material handling system
- Ensure perfect synchronization of material feed takt in sync with the assembly & process cycle times

## Connected Machines

- Takt synchronization & inspection automation built-in
- Preventive, predictive and condition-based maintenance program

## Warehouse Automation

- Automated storage and retrieval systems (ASRS), conveyors & automated packaging systems
- The entire cycle of warehouse operations - receiving, storage, retrieval, packaging & shipping

# Industrial IoT
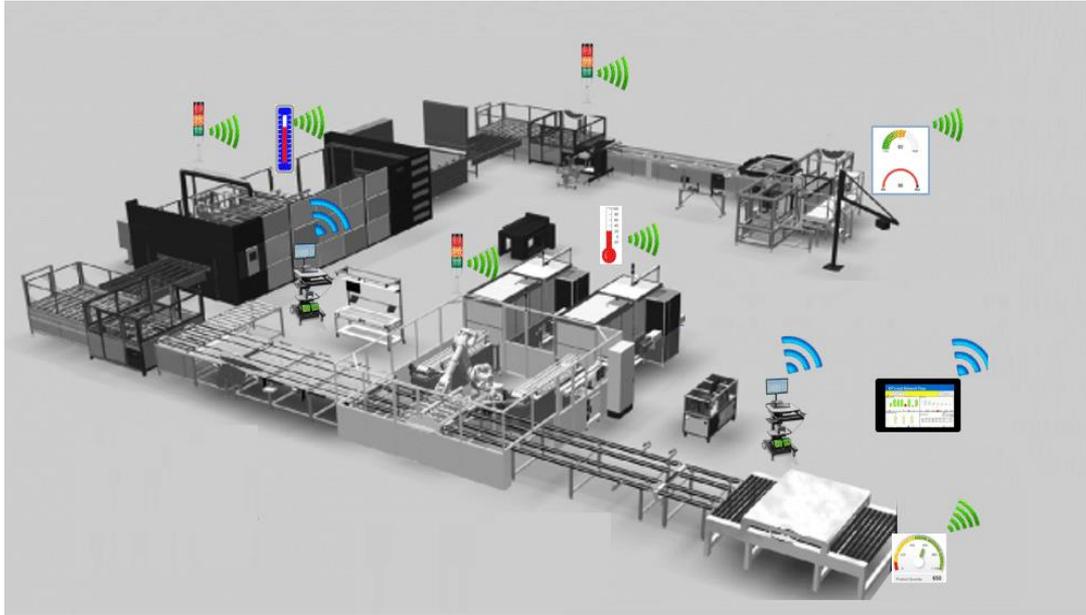


1. Industrial gateways (data concentrators)

2. Wireless hardware concentrators

3. Indoor positioning systems

4. Smart forklift / cranes

5. Asset trackers

6. Safety wearables (shoes, helmets, wristbands)

# Fourth wave of quality

## Progress through Quality



India Centric Inclusive Solutions

Stakeholder Value Proposition through out the product life; & Ability to anticipate and prepare products for next generation

Innovation

Wave – 4
Quality of Life

Total Cost Management

Resource Productivity

Sustainability

Wave – 3
Organization Quality

Wave – 2
Process Quality

Total Quality Management

Lean Six Sigma

Wave – 1
Product Quality

SPC & Quality Systems

Total Employee Involvement

Operational Excellence

Customer's eye

1990    2000    2010    2020

Conformance to Specifications

Fitness for Use, Purpose

Ability to satisfy stated and / or implied needs

# Quality Balance

No failures

Cost    Suppliers    Technology

Judgment

Automation

Digitization

**Physical Certainty
(Manufacturing Footprint)**
- Built-in Quality
- Built-in Process Controls
- Poka-yoke
- Functional Checks
- Automated Inspection

**Human Certainty
(Management & Operational Control)**
- Standardized Work
- Training & Skills
- Quality Attitude & Culture
- Neighbor Checking
  (No defect forwarding)

# Reliability value chain - Digitization



Source: https://bigdata.wayne.edu/auto-defense

# India centric inclusiveness

Fortune
100

Hundreds of $ 1
Billion +
Large Scale Industries

Thousands of  $ 10 Million +
Medium Scale Industries
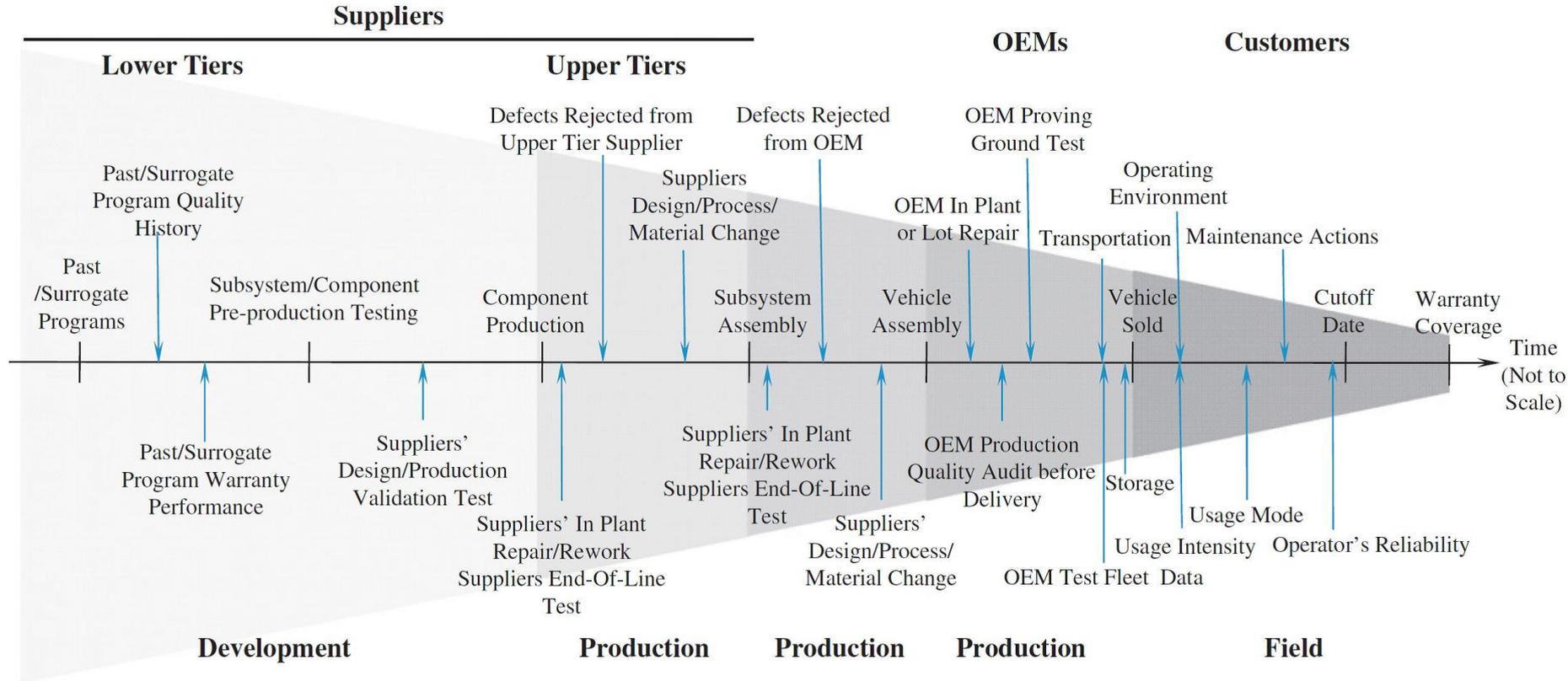
**Hundreds of Thousands of  $ 1 Million +
Small Scale Industries**
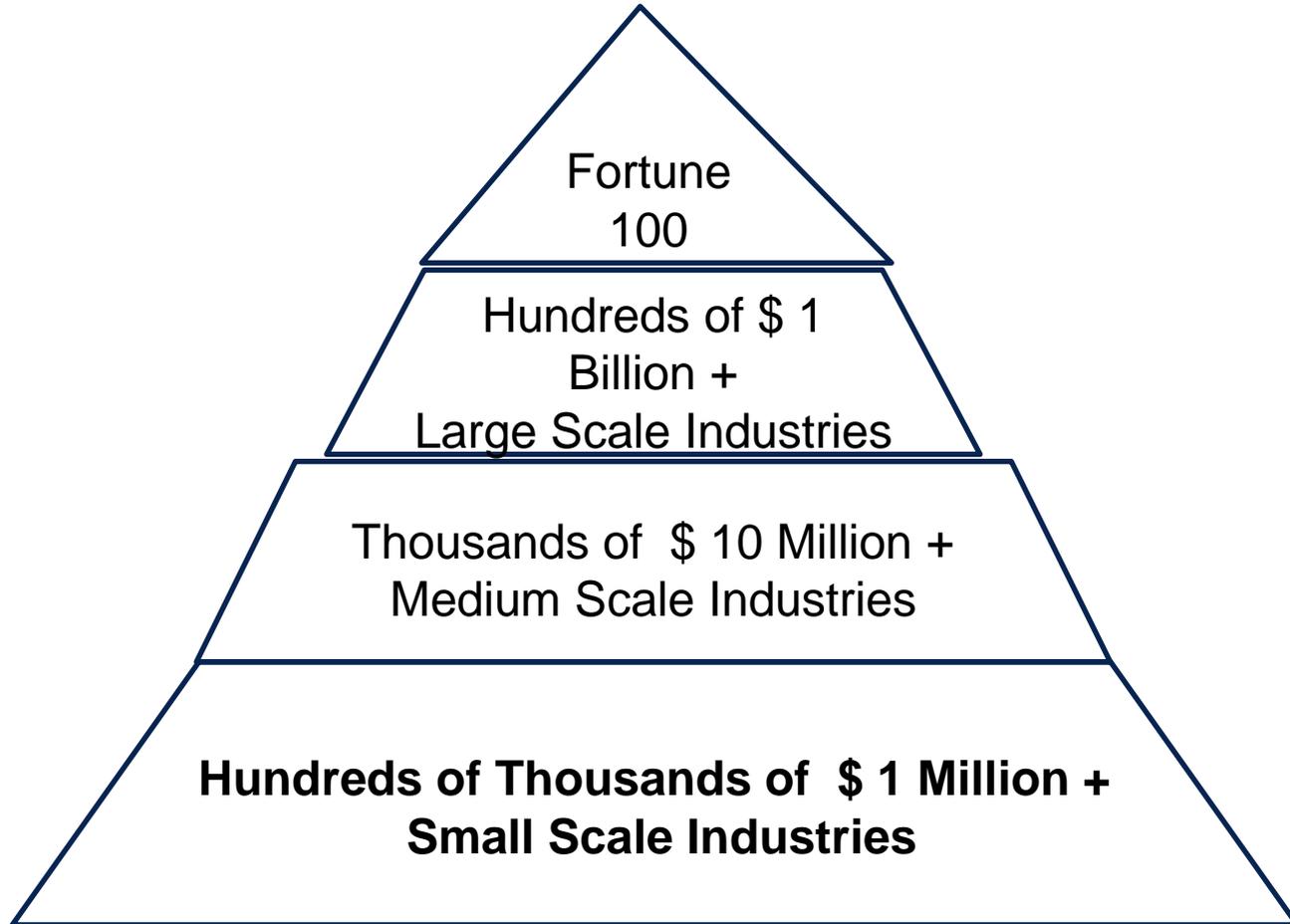
# Employee productivity and reskilling
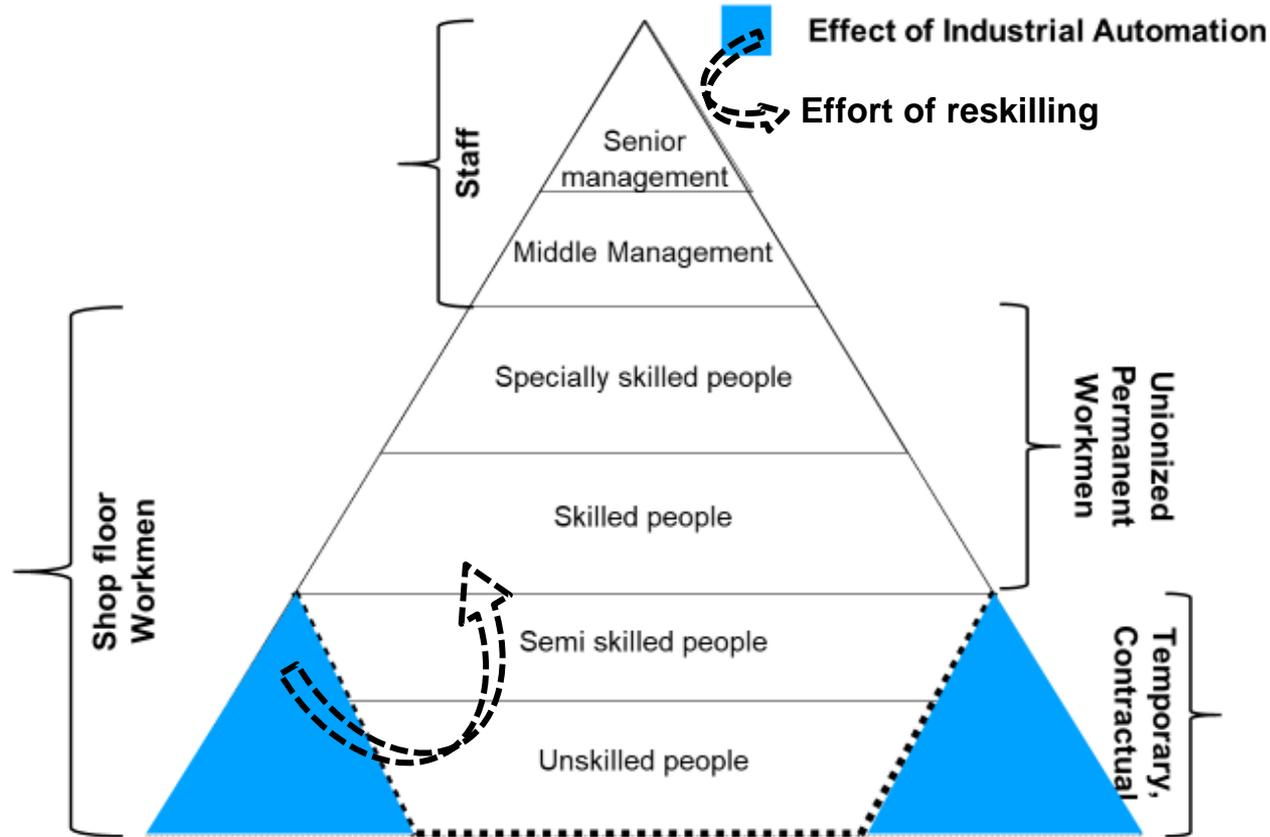
# Benefits of Automation & Digitization

| Capacity | Capability | Competency |
|---|---|---|
| • Enhanced productivity<br><br>• Scalable to global volumes | • Consistent quality<br><br>• Global competitiveness | • Operator re-skilling<br><br>• Real time monitoring of performance |

# Unified approach by stakeholders

**Government**
- Automation cluster approach for SME segment
- Investment subsidies for enhancing automation and digitization

**Institutes**
- Mentor & support start ups focused on automation and digitization in manufacturing
- Industry / Institute forums networking

**Industries**
- Skill centers for shop floor trainees (ITI / Diploma) on automation
- Implement scalable and affordable solutions for automation and digitization