Industry 4.0 – Manufacturing Challenges

Oron Oriol
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We are FLEX - 100+ sites in 30 countries

Ronneby, Sweden ● ●
Linkoping, Sweden ●

Venray, Netherlands ●
Woerden, Netherlands ●
Hoogeveen, Netherlands

Budapest, Hungary ● ●
Sarvar, Hungary ●
Tab, Hungary ●
Zalaegerszeg, Hungary ● ●
Lodz, Poland ●
Tczew, Poland ● ●

Burlington, Canada ●
Toronto, Canada ●
Ottawa, Canada ●

Cork, Ireland ●
Limerick, Ireland ● ●
Manorhamilton, Ireland ●

Nanjing, China ●
Shanghai, China ● ●
Suzhou, China ●
Wuzhong, China ●

Overland Park, KS ●
Coopersville, MI ● ●
Farmington Hills, MI ●
Buffalo Grove, IL ●
Northfield, MN ●

Manchester, CT ●

Mukachevo, Ukraine ●

Tianjin, China ●

Anyang, South Korea ●

Milpitas, CA ● ● ●
San Jose, CA ●
Morgan Hill, CA ●
San Francisco, CA ●

Warrington, UK ●

Timisoara, Romania ● ●

Ibaraki, Japan ● ●

Sonderborg, Denmark ●
Stuttgart, Germany ●
Hägglingen, Switzerland ●
Pardubice, Czech Republic ●
Brno, Czech Republic ●
Althofen, Austria ●
Vienna, Austria

Corlu, Turkey ●
Gebze, Turkey ●

Chengdu, China ● ●

New York

Austin, TX ● ● ●
Plano, TX ●
Irving, TX ●
Tempe, AZ ●

Taipei, Taiwan ● ●

Shenzhen, China ● ●
Huangtian, China ●
Shiyan, China ●
Gushu, China ● ●
Fuyong, China ●
Hong Kong, China ●
Dongguan, China ●
Zhuhai, China ● ●

Charlotte, NC ●
Morrisville, NC ●
Columbia, SC ●
Atlanta, GA ●
Memphis, TN ●
Louisville, KY ●

Pamplona, Spain ●
Milan, Italy ● ●
Treviso, Italy ●
Trieste, Italy

Migdal Haemek, Israel ● ●
Haifa, Israel
Ofakim, Israel
Yavne, Israel
Petah Tikva, Israel

Gurgaon, India ●
Mumbai, India ●
Pune, India ●
Bangalore, India ●
Chennai, India ● ●

Cebu, Philippines ●

Tijuana, MX ● ●
Juarez, MX ● ●
Reynosa, MX ●
San Luis, MX ●

Aguascalientes, MX ● ●
Guadalajara, MX ● ●

Manaus, Brazil ●

Singapore ●
Batam, Indonesia

Penang, Malaysia ● ●
Port of Tanjong Pelepas, Johor , Malaysia ● ●
Senai, Johor, Malaysia ●
Skudai, Johor, Malaysia ● ●

● Manufacturing

● Mechanicals

● Design

● Global Services

Jaguariuna, Brazil ●
Sorocaba, Brazil ● ●

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Global Scale & Reach

$25 billion
company

200,000
employees

100+
locations

52 million
sq. ft. of manufacturing
and services space

30
Countries

14,000
active global
suppliers

>1,000
global customers

1.2 million
active components

2,500
design engineers

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Insight Across Industries

Healthcare	Automotive	Industrial	Home Appliances	Capital Equipment	Energy
$2 Billion	**$2** Billion	**$1** Billion	**$1** Billion	**$1** Billion	**$1** Billion

Datacom	Telecom	Server/Storage	Wearables	Connected Living	Smartphones
$3 Billion	**$3** Billion	**$3** Billion	**$1** Billion	**$1** Billion	**$3** Billion

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Flex Sites in Israel

Migdal Haemek	Haifa	Petah Tikva	Sderot & Yavne	Ofakim
PCBA & Logistics Center	Medical Design Center	Danel Embedded Solutions	HLA & Mechanical Operation	PCBA & Logistics Center
50,000 sq/m	1,200 sq/m	1,400 sq/m	20,000 sq/m	15,000 sq/m
1,900 Employees	40 Design Engineering	50 Employees	660 Employees	830 Employees

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Average World GDP Per Capita

($ USD)*

Industrial Age

Modern Age

Information Age

Intelligence Age

10000

1000

100

0.5% growth

2.0% growth

2.5% growth

3.5% growth

1750   1850   1970   2010

*Source: World Bank, De Long- UC Berkeley
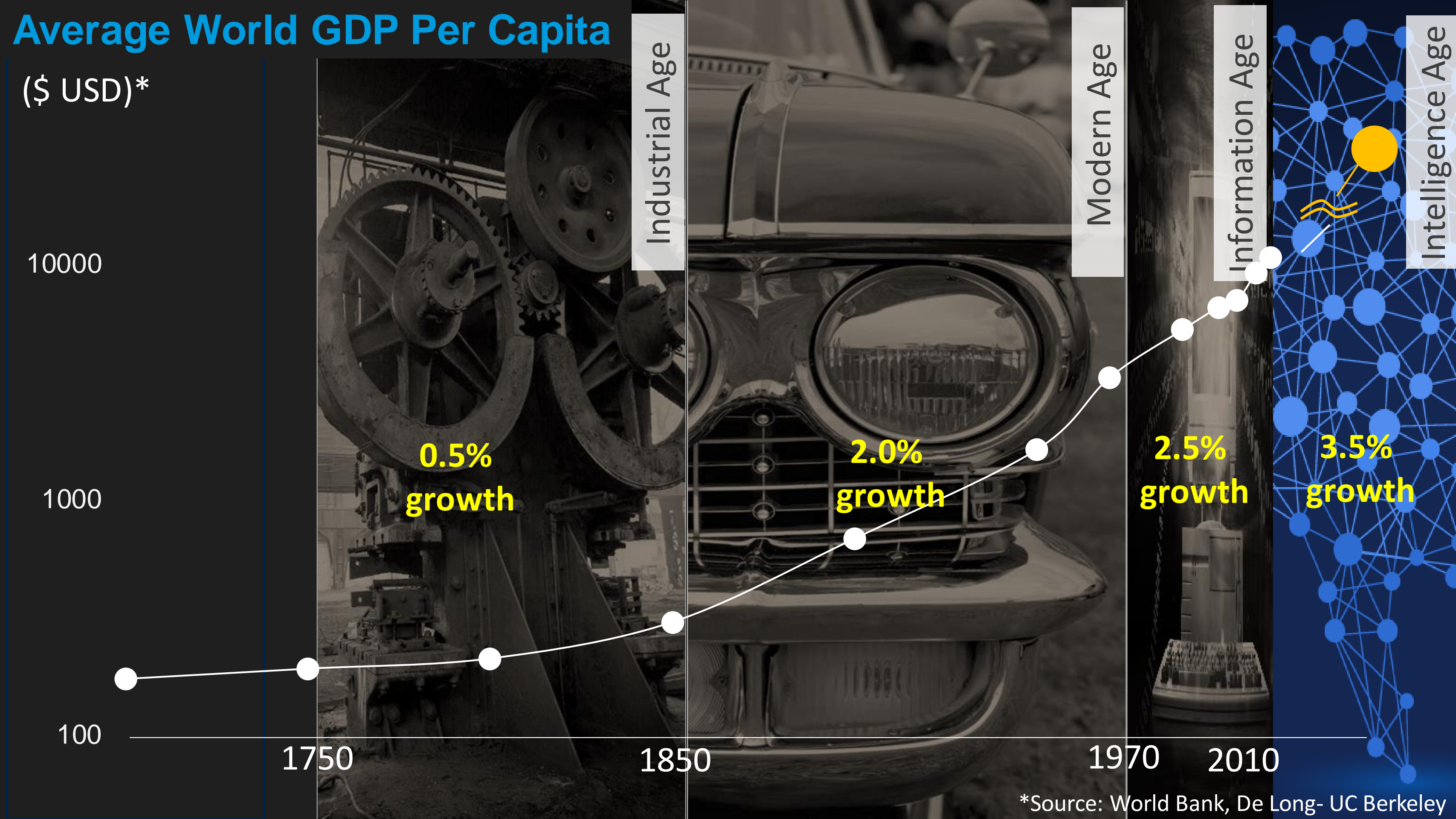
Industry 4.0 Drivers
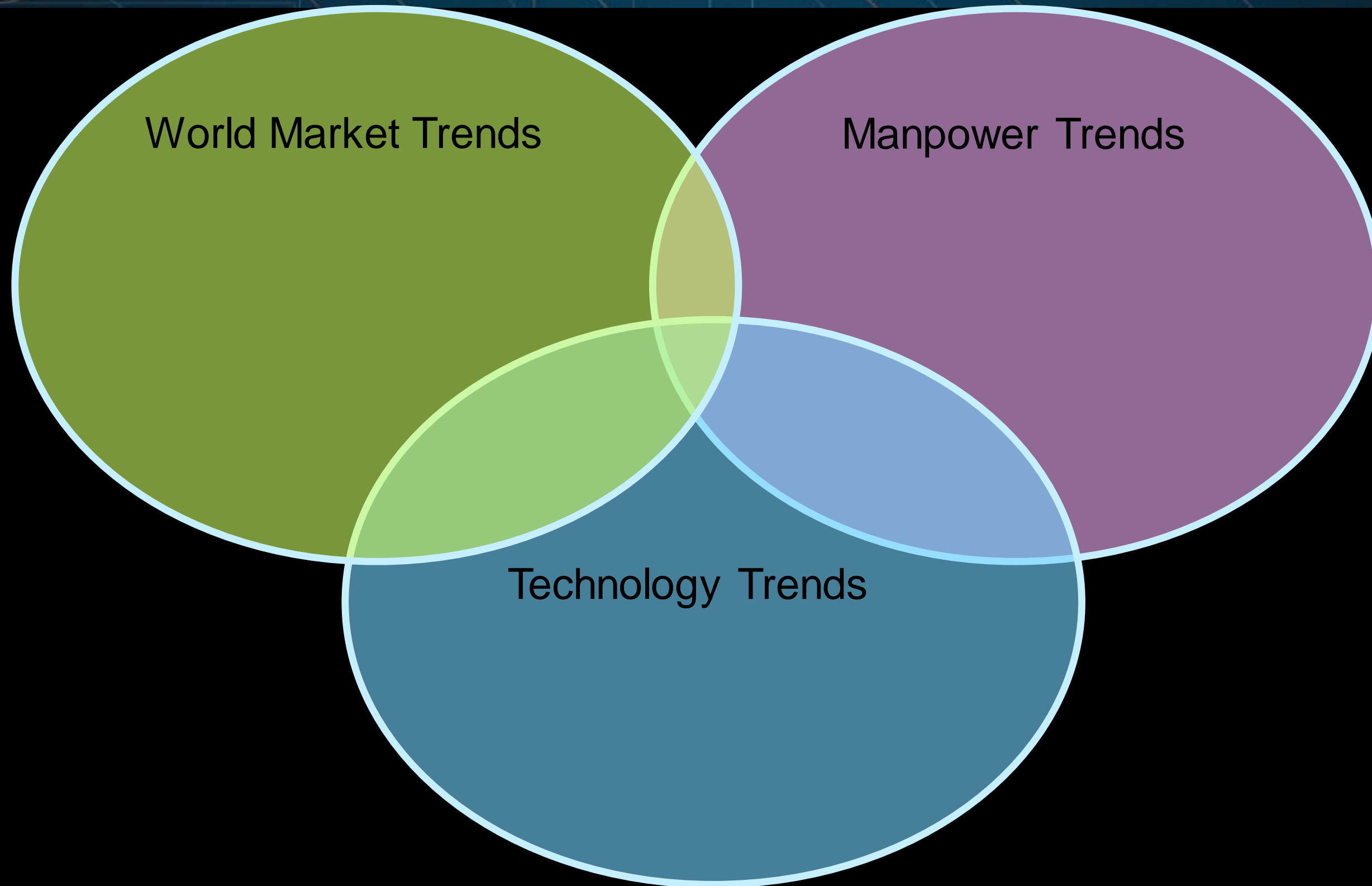
World Market Trends

Manpower Trends

Technology Trends

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World Market Trends

Faster Product Cycles

Growth of Asian OEMs

Increased Regionalization

Supply Chain Complexity

More Disruptive Products

New Hardware OEMs

Innovation on the Rise

Corporate Social Environmental Responsibility

Internet of Things

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Manpower Trends

- Growing mid-class

  Less manufacturing HR Capital

- Rapid aging population

- Cost of Labor in rise

Labor cost by region

100%

10%

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Technology Trends

Advanced Processors

Smart Sensors

Automation

Robotics

Smart warehouse

IOT
Smart Connectivity
Cloud Control

Machine/
Deep Learning
AI

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Industry 4.0 Drivers

World Market Trends

- Increased regionalization
- Mass customization
- Strong competition
- Price drop

Manpower Trends

- Growing mid-class -> Less manufacturing HR Capital
- Rapid aging population
- Cost of Labor in rise

Technology Trends

- IOT
- Cloud computing
- Automation & industrial robotics
- Machine Learning, AI
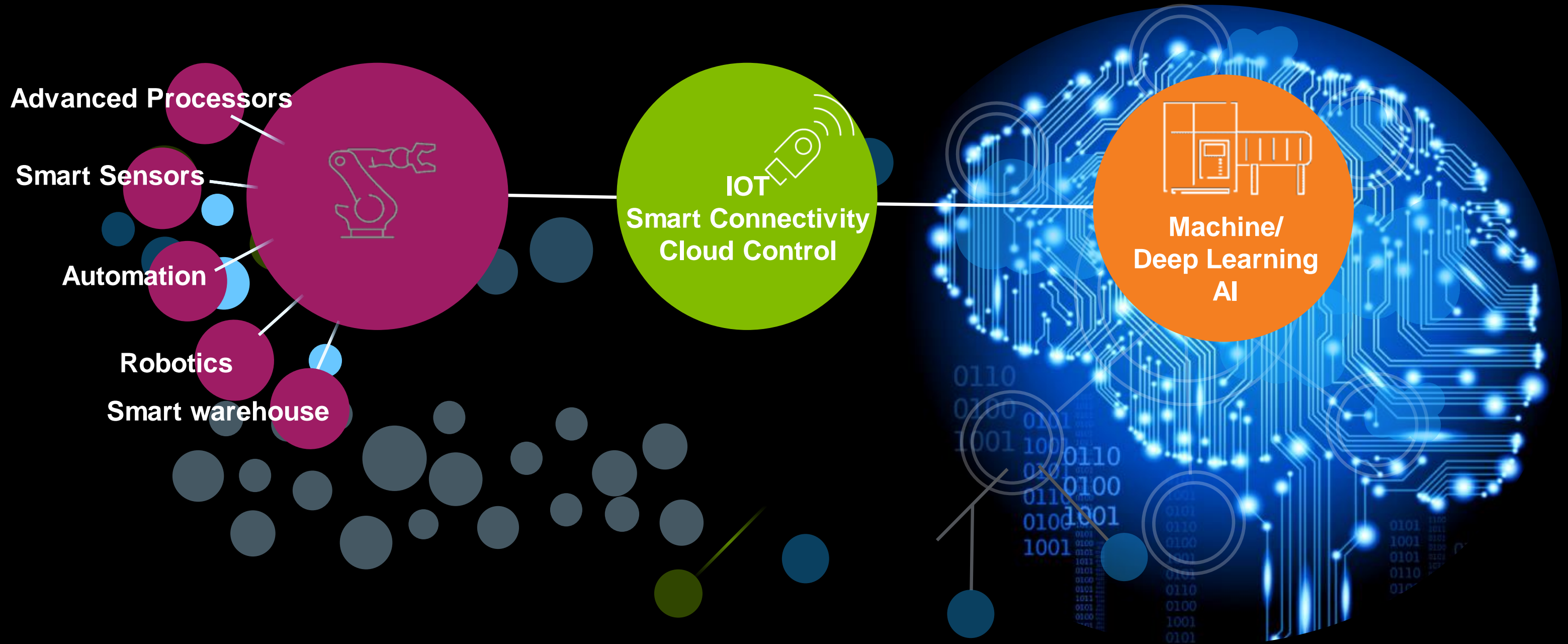
Industry 4.0 - SMART Automation
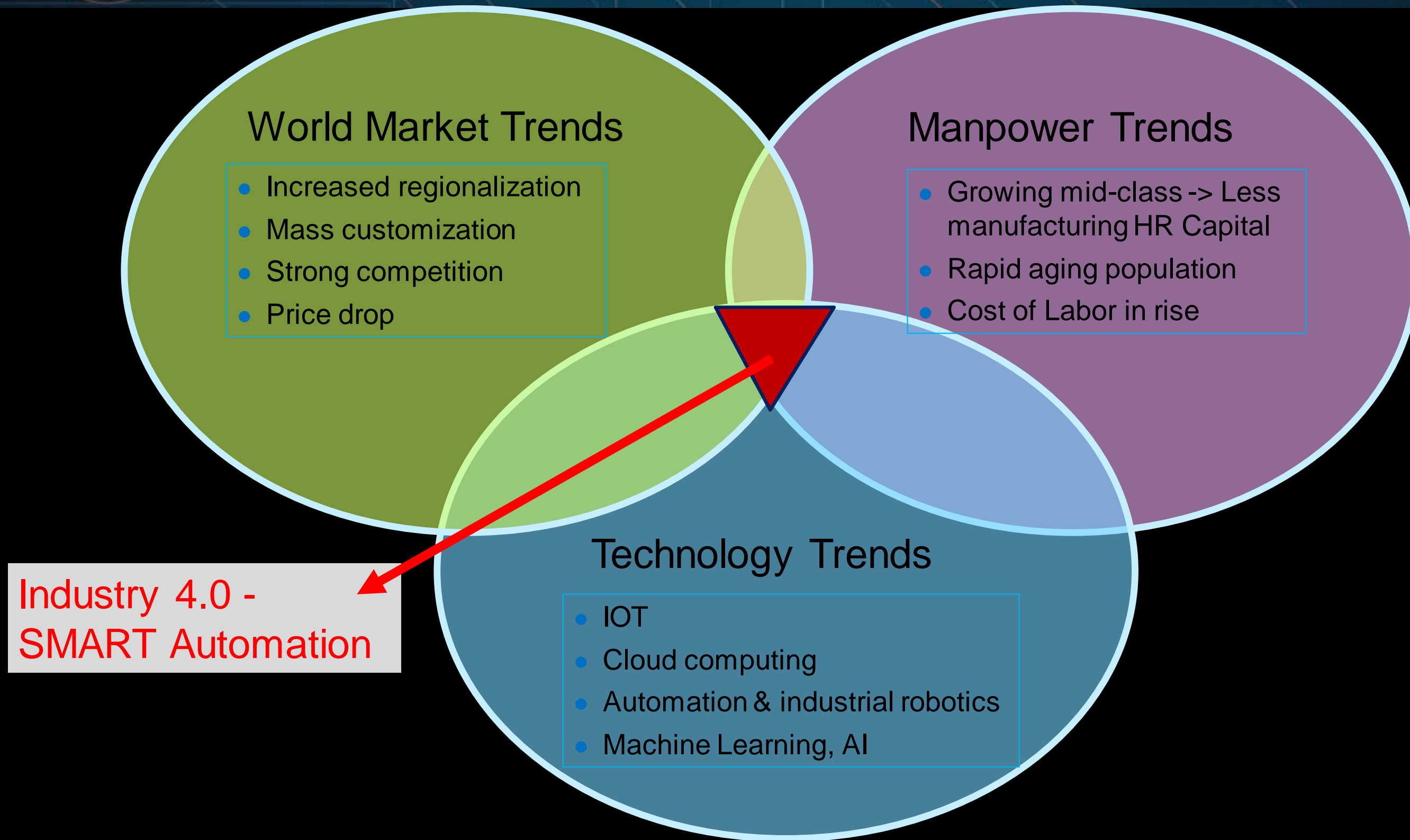
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SMART Automation Flex Strategy

EMS Projects

- Interconnected, touchless assembly operation
- Closed-loop process, traceability,
- real-time control, intelligent and predictive analytics

SMT PnP Reflow AOI Post-SMT XRAY ICT

FRC Road Map (Functional Robotics Cells)

Sketch to Scale Initiatives

Sketch
Global Design Centers

- Design for Automation
- Design for Manufacturing

Scale
Business Segments

- Partnering with OEM's
- Design automation lines

New Industries Projects

- New business model: sketch to scale
- selling capital equipment
- Automated Sock Liner (ASL)

NIKE
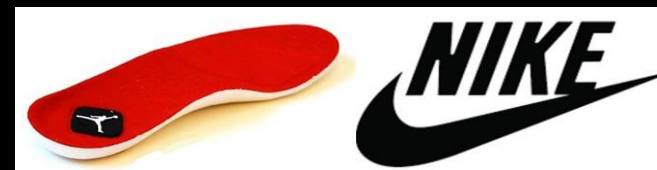
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Flex's SMART Automation Principles

- **Standardization of Automation**

  Minimize Deployment Cost and Lead Time

- **Machine Communication**

  Each machine is Networked to the Flex SMART Cloud Platform

- **Automated Data Virtualization**

  Information Transparency interfacing the Cloud

- **Real Time Monitoring & Control**

  Maximized Productivity and Quality

- **Total Manufacturing Management**

  Increase Productivity and Equipment Utilization

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Flex's SMART Automation **Implementation**

3 Phases Deployment

- **Phase 1**

  From SMT Touchless line through AOI inspection

- **Phase 2**

  Automate processes from post SMT to ICT Test

- **Phase 3**

  Automated Mechanical Assembly

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Thank You

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