



CHANCES & CHALLENGES OF INDUSTRY 4.0 WORKFORCE

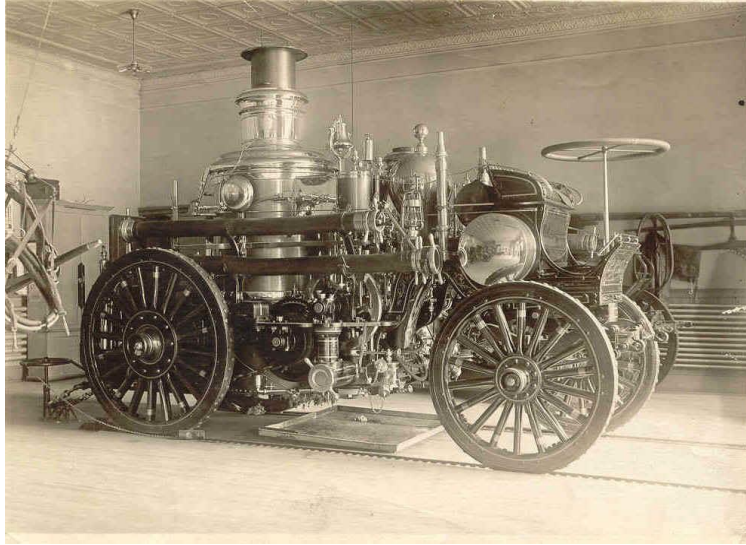
Jakarta, April 17th, 2017



Ministry of
Industry

REPUBLIC OF INDONESIA

Industrial Revolution Timeframe



1.0 | 1784

based on mechanical production
equipment driven by water and
steam power



2.0 | 1870

based on mass production
enabled by the division of labor
and the use of electrical energy



3.0 | 1969

based on the use of
electronics and IT to further
automate production

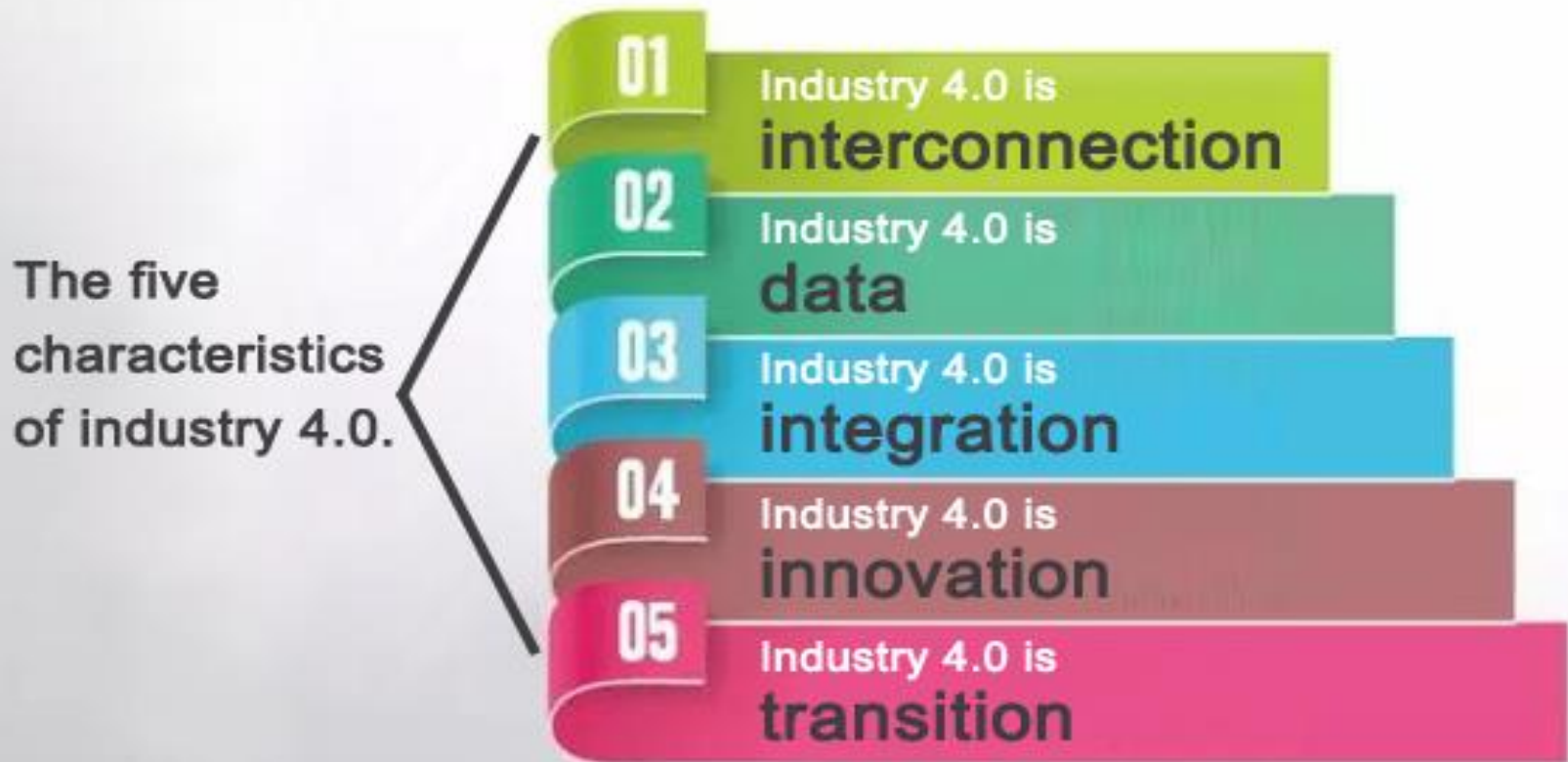


4.0 | tomorrow

based on the use
of cyber-physical
systems



Principle Of *Industry 4.0*



The key essence of Industry 4.0 Concept is **the enhancement of efficiency in the process of industry by way the utilization of connectivity and ICT (Information & Communication Technology).**

Segment of Enterprise in Industry 4.0

Technology Provider

- Artificial Intelligence (AI)
- Internet of Things
- Virtual & Augmented Reality
- Sensor & Scanning
- 3D Printing
- Robotics / Automation

Infrastructure Provider

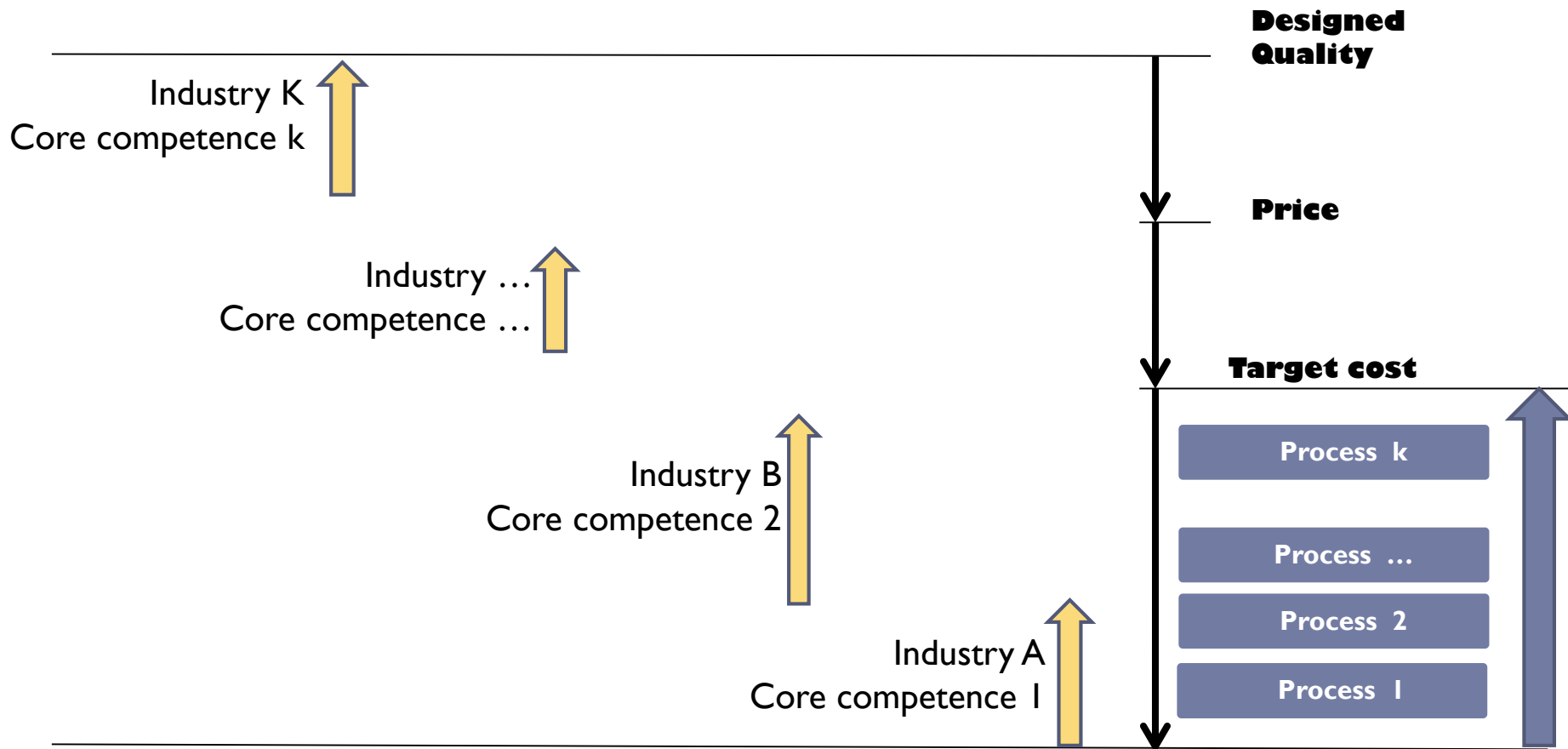
- Internet Service Provider (ISP)
- Big Data Server
- Cloud Computing
- Telecommunication

Technology and Infrastructure User

- Capital Goods Industries (e.g. Machinery, Base Metal, etc.)
- Consumer Goods Industries (e.g. Automotive, Electronics, etc.)
- Industrial Services (e.g. Logistics, Maintenance, Engineering, etc.)

Paradigm Shift in Industry 4.0

► Value Added Optimization in each Industrial Value Chain



Paradigm Shift in Industry 4.0

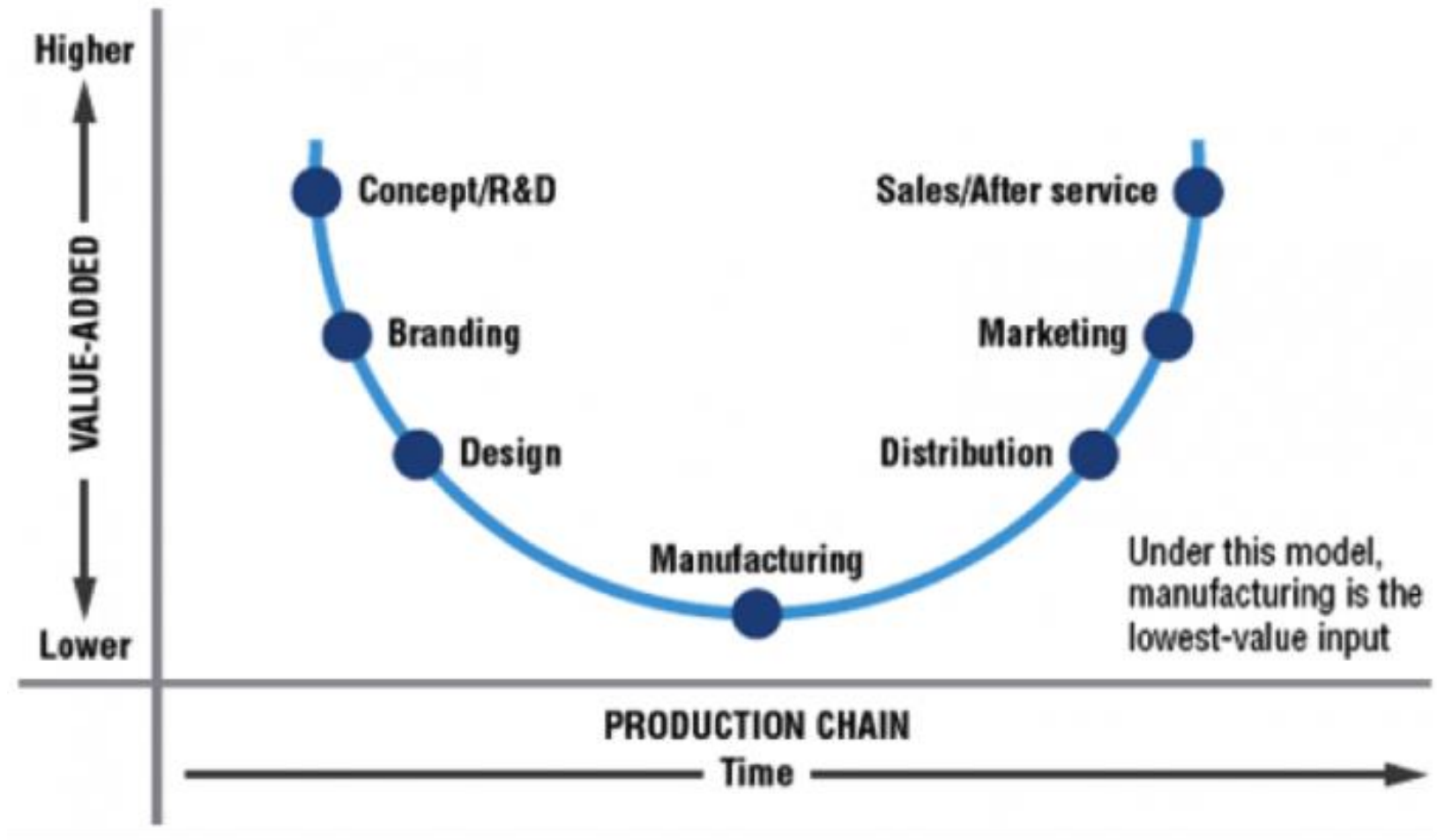
- ▶ Industrial Structure, derived as **Upstream to Downstream**
- ▶ Industrial Value Chain, derived as follows:
R&D → Branding → Design → Manufacturing → Distribution → Marketing → After Sales
- ▶ Transformation of Industrialization System :

One stage of value chain
(*especially manufacturing*), is
conducted within an
industry *from raw
materials to end product*

One segment of
industrial structure
(*upstream or
downstream product
only*), is conducted by
an industry *within all
Value Chain*

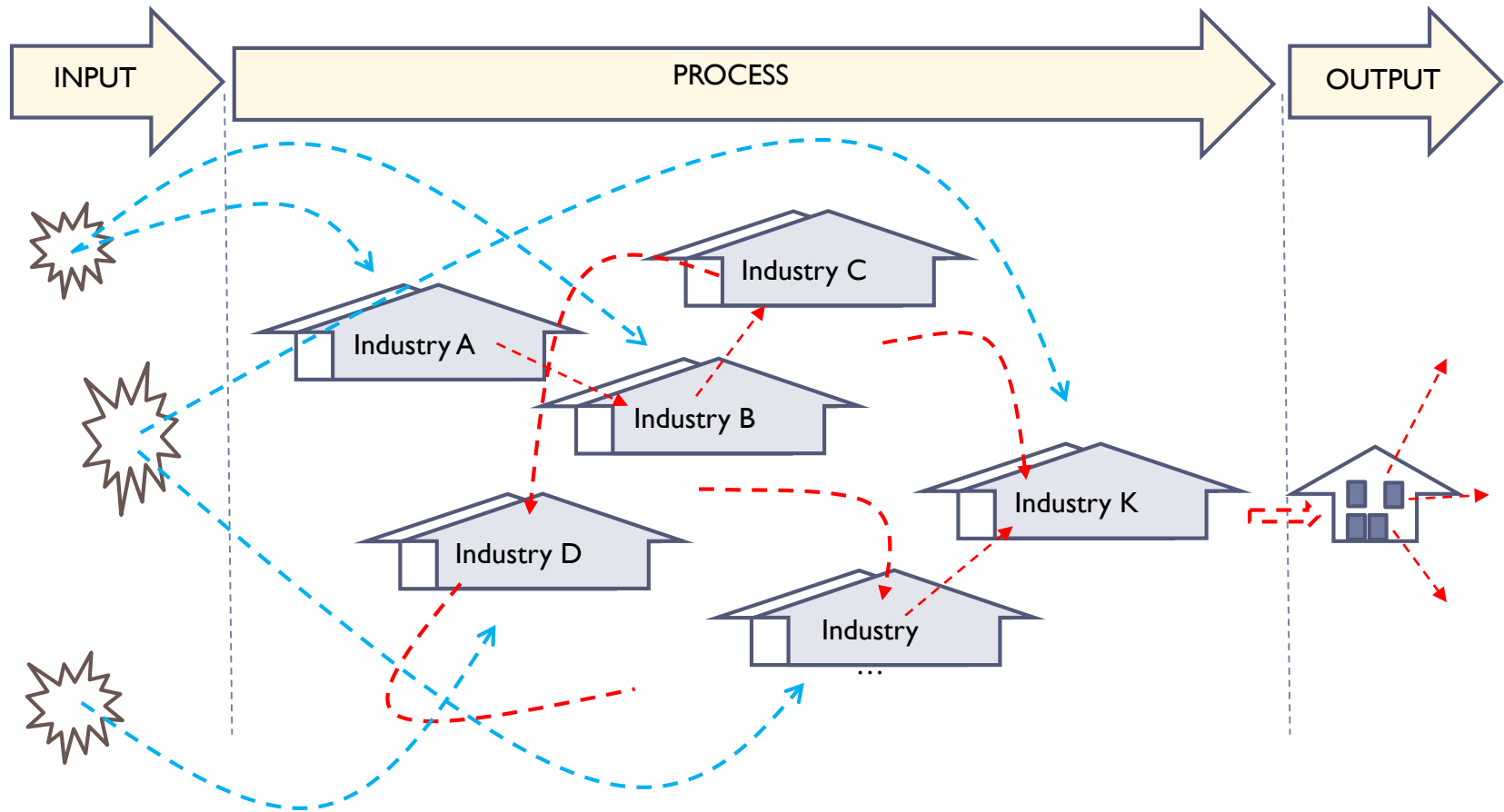
More efficient
and competitive

Global Value Chain (GVC)



Paradigm Shift in Industry 4.0

► Disruptive Manufacturing



Production processes and products are being decentralized and digitized;
manufacturers, suppliers and customers are establishing closer networks and innovation cycles are being reduced.

Digital Compass of Industry 4.0



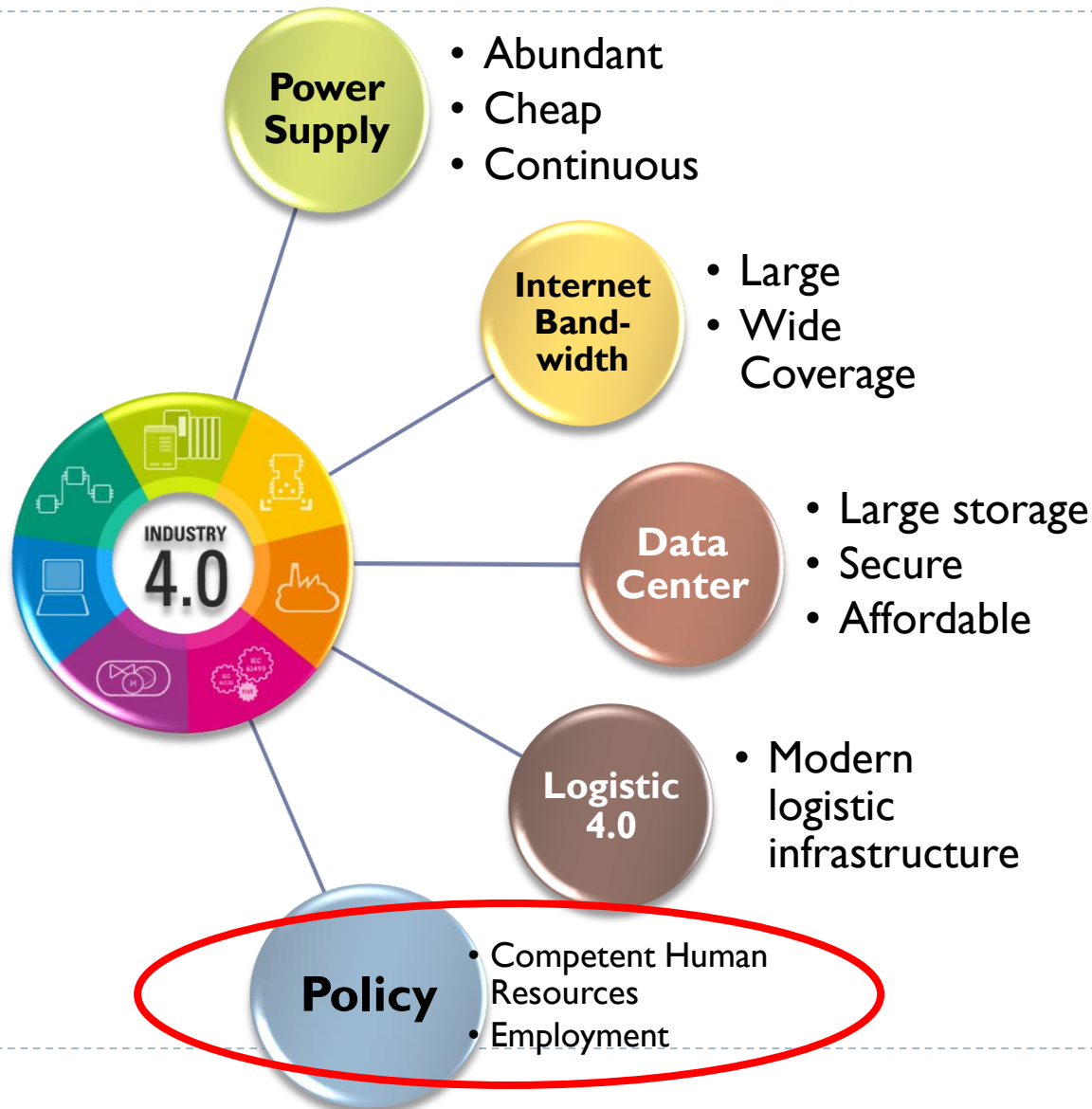
Digital Compass of Industry 4.0 represents new technologies related to each aspects within an industry.

It divides into number of aspects which are:

- Inventories
- Quality
- Supply/Demand Match
- Time to Market
- Services/Aftersales
- Resources/Process
- Asset Utilization
- Labor

Would it be
CHALLENGES
or
CHANCES
???

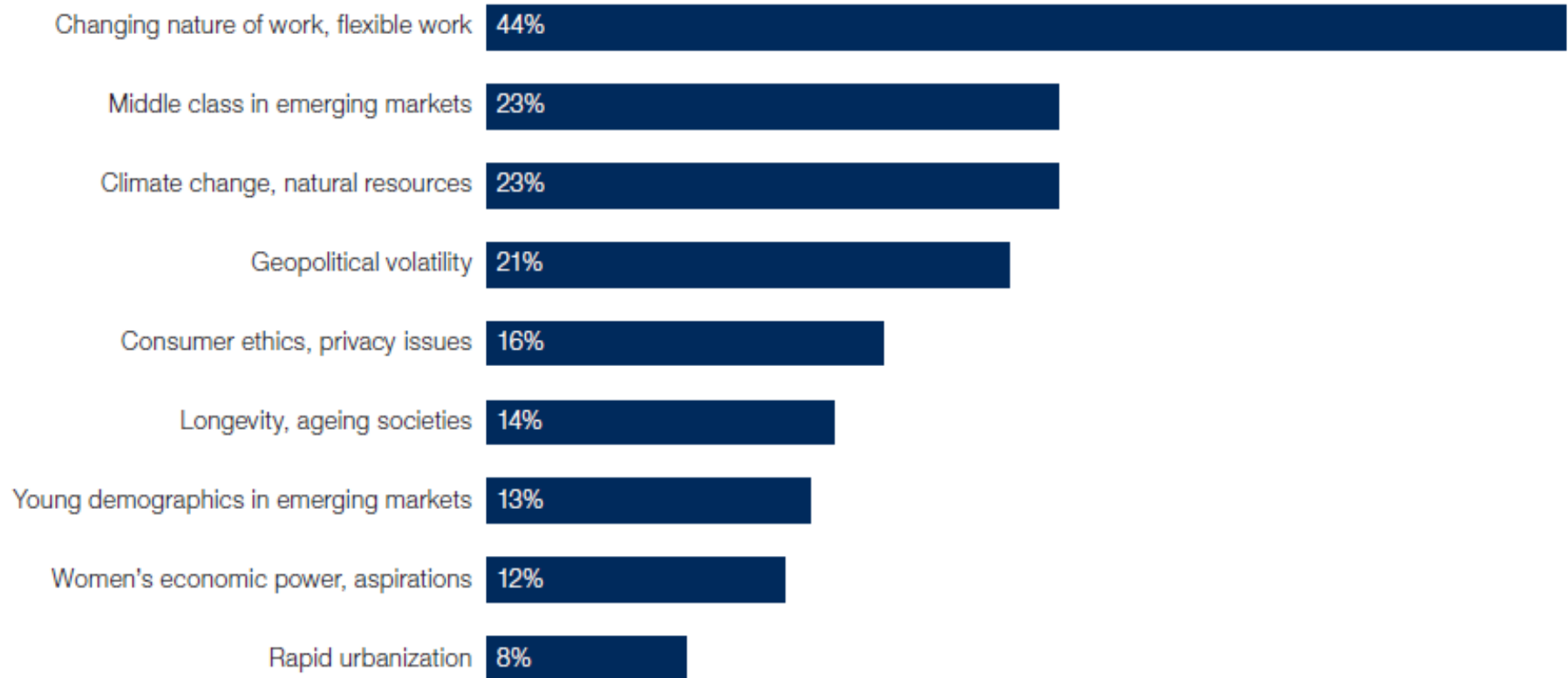
Preparation Towards Industry 4.0



The Future of Jobs

Share of respondents rating driver as top trend, %

DEMOGRAPHIC AND SOCIO-ECONOMIC



Source: Future of Jobs Survey, World Economic Forum.



The Future of Job Skills Requirements

Abilities

Cognitive Abilities

- » Cognitive Flexibility
- » Creativity
- » Logical Reasoning
- » Problem Sensitivity
- » Mathematical Reasoning
- » Visualization

Physical Abilities

- » Physical Strength
- » Manual Dexterity and Precision

Basic Skills

Content Skills

- » Active Learning
- » Oral Expression
- » Reading Comprehension
- » Written Expression
- » ICT Literacy

Process Skills

- » Active Listening
- » Critical Thinking
- » Monitoring Self and Others

Cross-functional Skills

Social Skills

- » Coordinating with Others
- » Emotional Intelligence
- » Negotiation
- » Persuasion
- » Service Orientation
- » Training and Teaching Others

Systems Skills

- » Judgement and Decision-making
- » Systems Analysis

Complex Problem Solving Skills

- » Complex Problem Solving

Resource Management Skills

- » Management of Financial Resources
- » Management of Material Resources
- » People Management
- » Time Management

Technical Skills

- » Equipment Maintenance and Repair
- » Equipment Operation and Control
- » Programming
- » Quality Control
- » Technology and User Experience Design
- » Troubleshooting

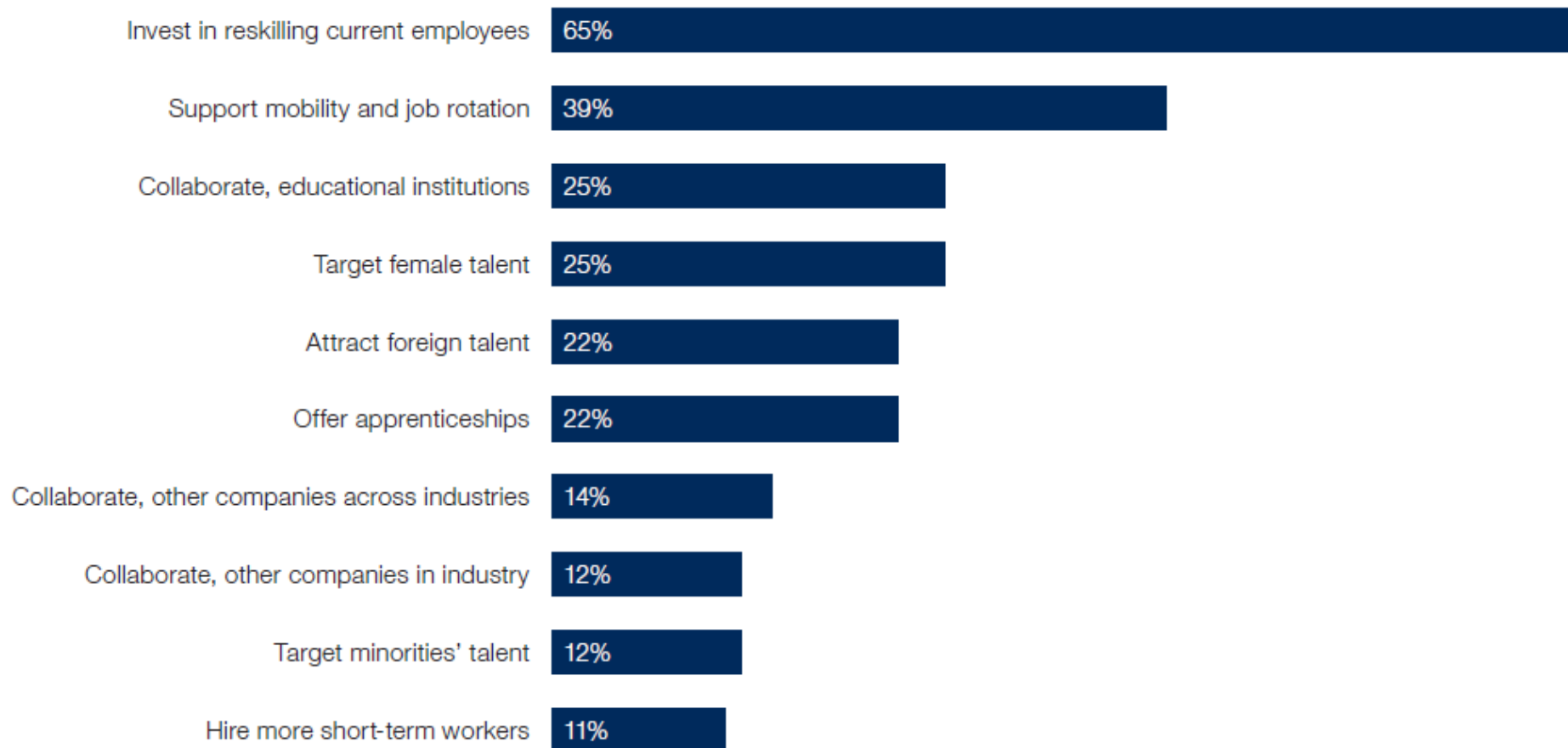


Source: World Economic Forum, based on O*NET Content Model.



Strategies Planned by Industries

Share of respondents pursuing strategy, %



Source: Future of Jobs Survey, World Economic Forum.



Immediate Focus

Reinventing the HR function

Making use of data analytics

Talent diversity

Leveraging flexible working arrangements
and online talent platforms

Incentives for industries regarding workforce
competencies

Long-Term Focus

Rethinking education systems

Incentivizing life-long learning

Cross-industry and public-private
collaboration

National Standards on Workforce
Competencies



THANK YOU

AGENCY FOR RESEARCH & DEVELOPMENT OF INDUSTRY

