INDUSTRIE 4.0

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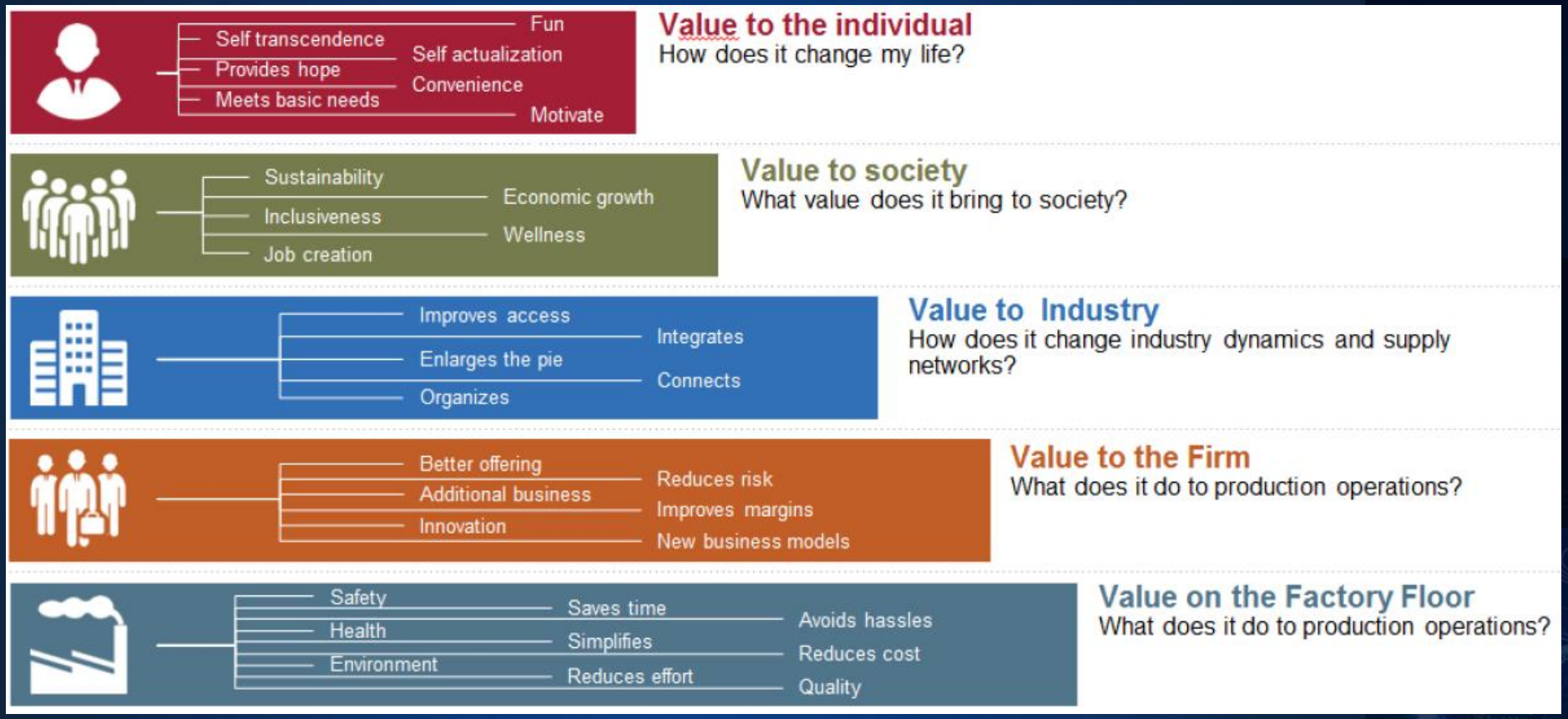
200,000 years
1860: 650 million
2020: 7.8 billion

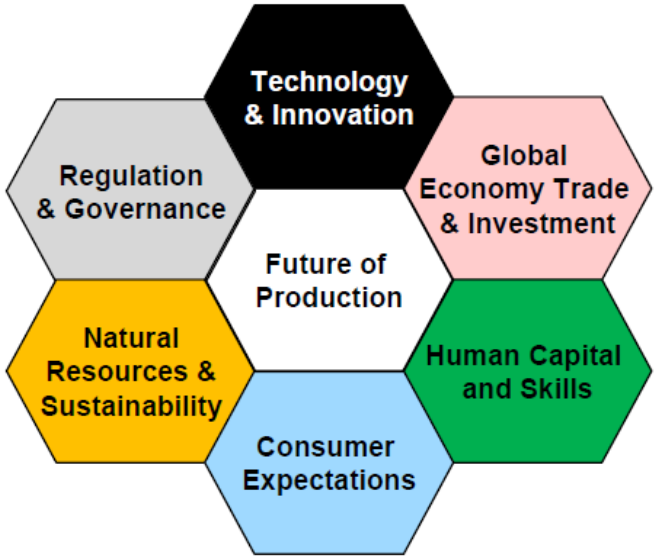
Sources of value creation from emerging technologies



Source: WEF, Nov. 2016. NY, USA. Disruptive technologies shaping the future of production.

Six drivers that will be most impactful in shaping the future of production

Drivers	Avenues of Interest
 Technology and Innovation	• Understanding implications of advanced manufacturing technologies • Identifying technologies that will define the future of production
 Global economy, trade & investment	• Distinguishing trends in relation to distributed manufacturing and expansions of global value chains • Assessing relevance of existing competitions to changing economics of production
 Human Capital and Skills	• Isolating essential skills required for the workforce for the future • Designing the role of governments and companies in reskilling the workforce
 Consumer expectations	• Detecting patterns of consumer behavior driving demand • Describing consumer consumption attitudes and expectations impacting production
 Natural Resources & Sustainability	• Recognizing the role of new circular economy paradigm impacting production • Measuring and regulating environment and energy demand to incentivize green production
 Regulations and Governance	• Defining regulatory frameworks that would enable innovation, technology adoption and new models • Increasing transparency and protecting citizen's interest



- We have developed a fact base around each of these drivers
- We then developed focal questions for each fact base

Source: WEF, Nov. 2016. Berlin, Germany. Scenario and Vision Development

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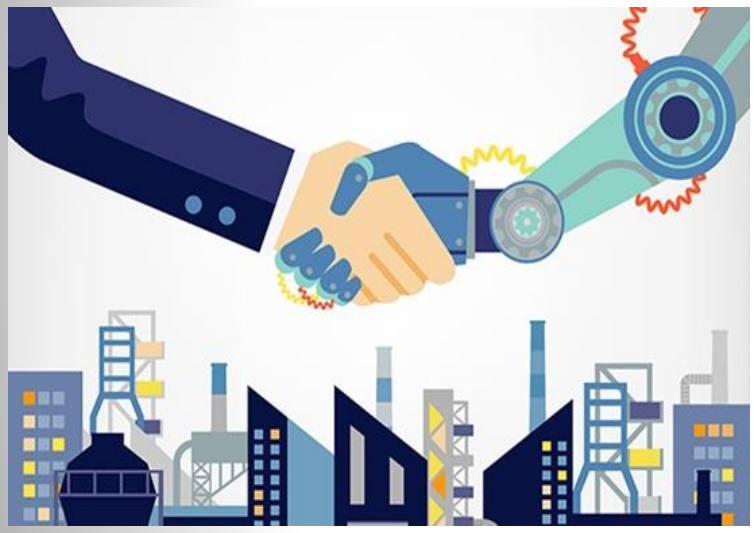
Technological Impacts just following Moore`s Law

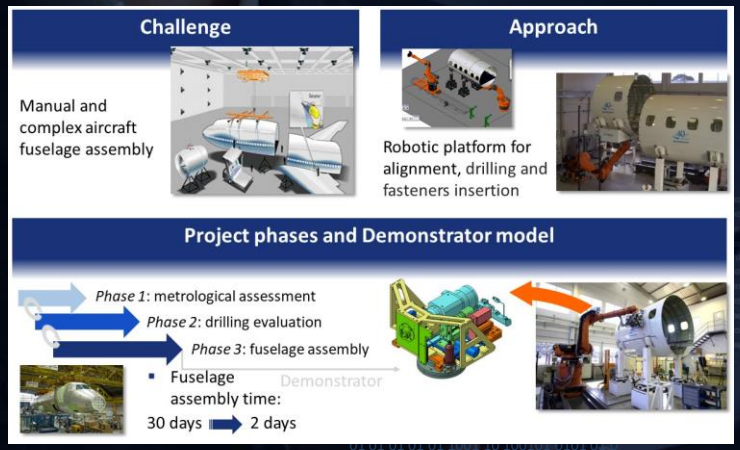
From the original Industry to Industry 4.0:
On the way to the 4th industrial revolution



- Digitalisation, sensing and weareables
- Autonomous and collaborative robotics
- Hybrid Processes and Products
- Analitcs and artificial Intelligence

4th Industrial Revolution | Based on Ciber-physical production systems

Automation and Robotics



LAME-ITA

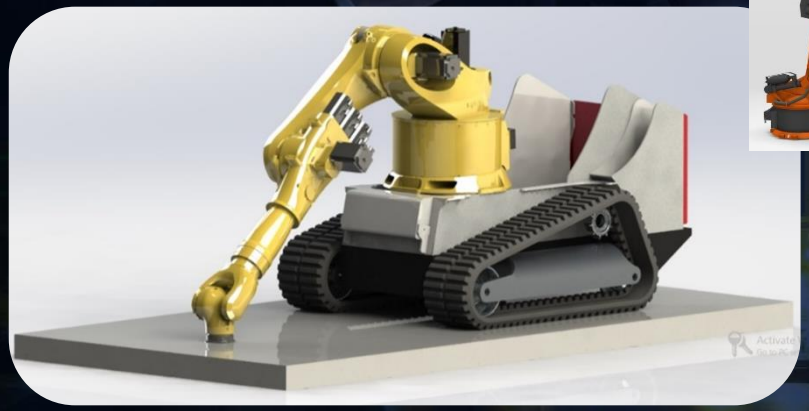
Laboratório
de Automação de
Montagem Estrutural

EMBRAER

Célula de Automação Industrial

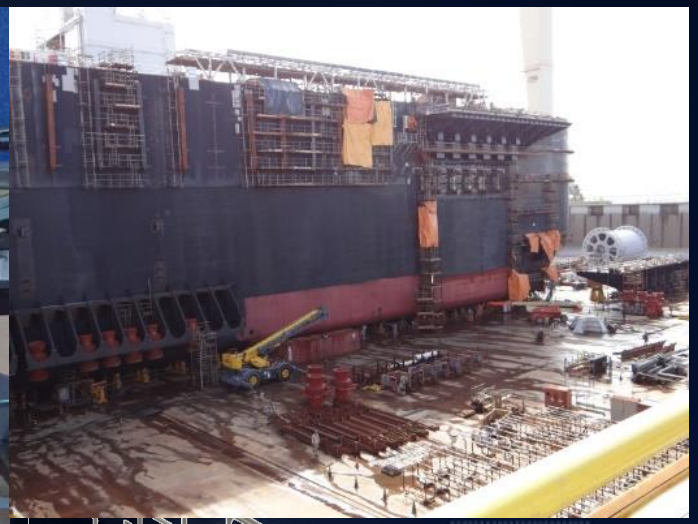
Dez 2011

Automation and Robotic
collaborative robotics



Sistemas de Manufatura

Projeto: Robô de pintura (Aranha)



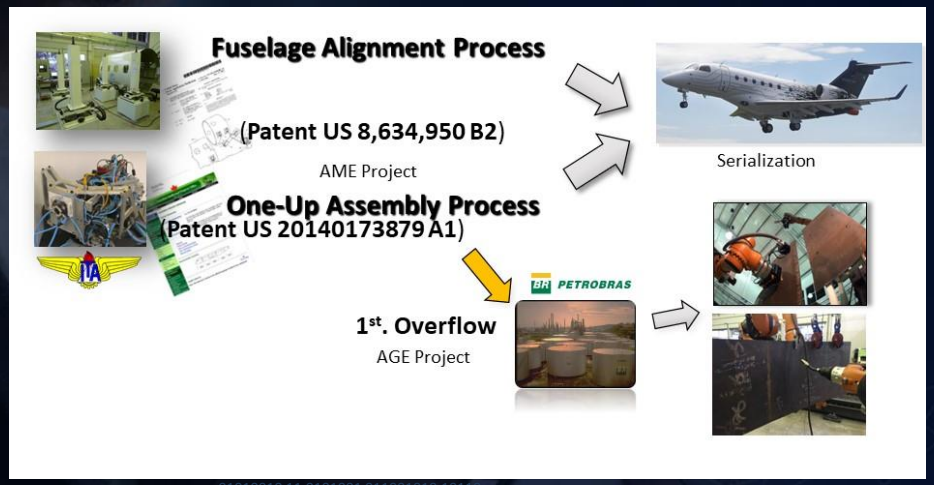
- Empresa:
  - Óleo e gás
- Propósito
  - Robô de revestimento
- Resultados
  - Segurança
  - Produtividades
  - Qualidade

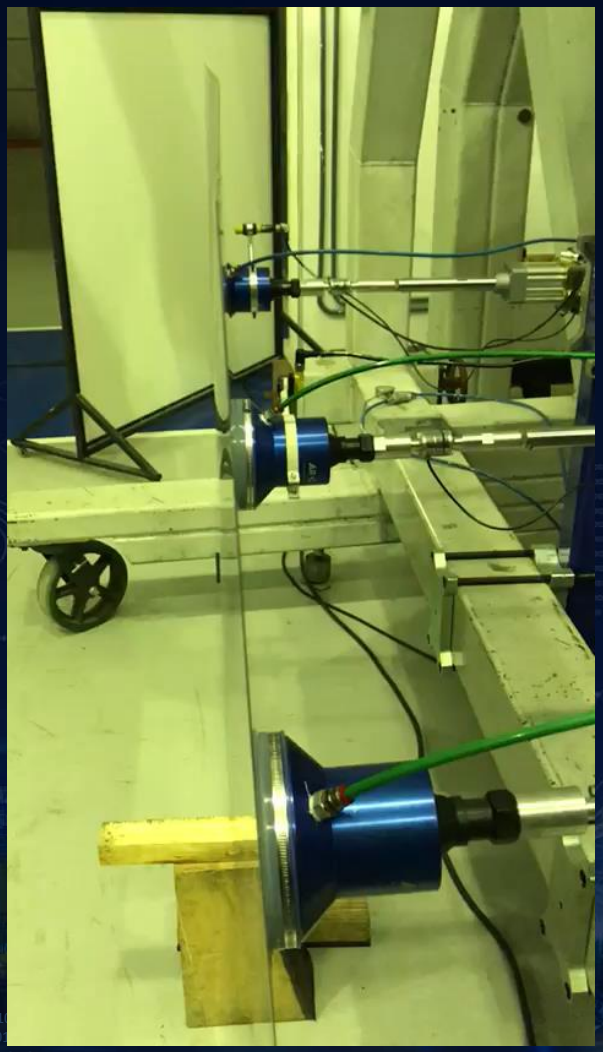
Automation and Robotics
Flight simulator

- **Robotic Platform Flight Simulator (SIVOR, 2015-now)**
  - Robotized flight simulator for training and engineering development.
- **Industrial Partner:** EMBRAER
- **Robots + Cockpit + Models**
- **Online Trajectory Generation**

  - Systems Integration
  - Software Development
  - Mechanical Design (Structural & Journal Weight)

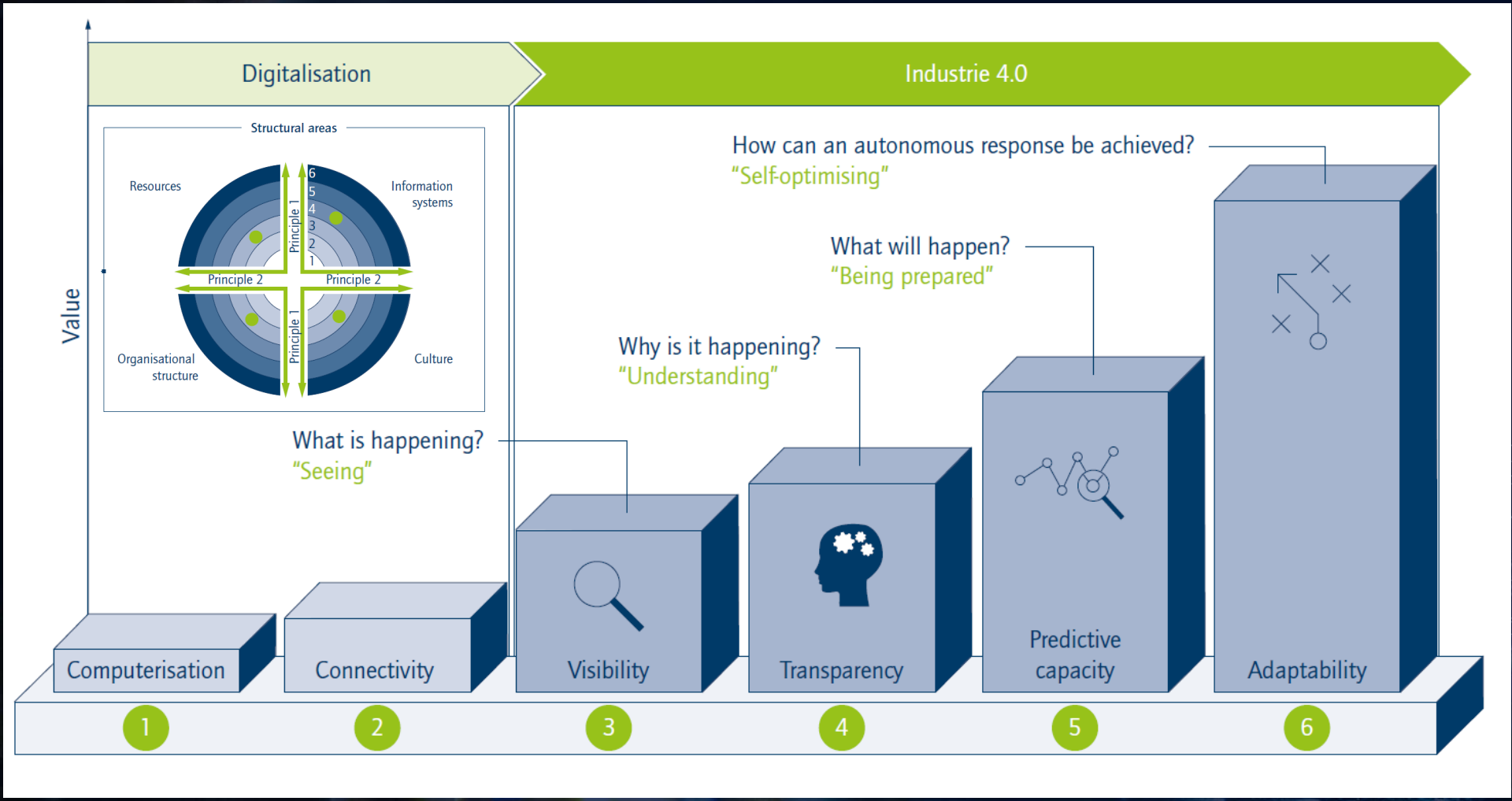
Technology Overflow
Hybrid Processes and Products





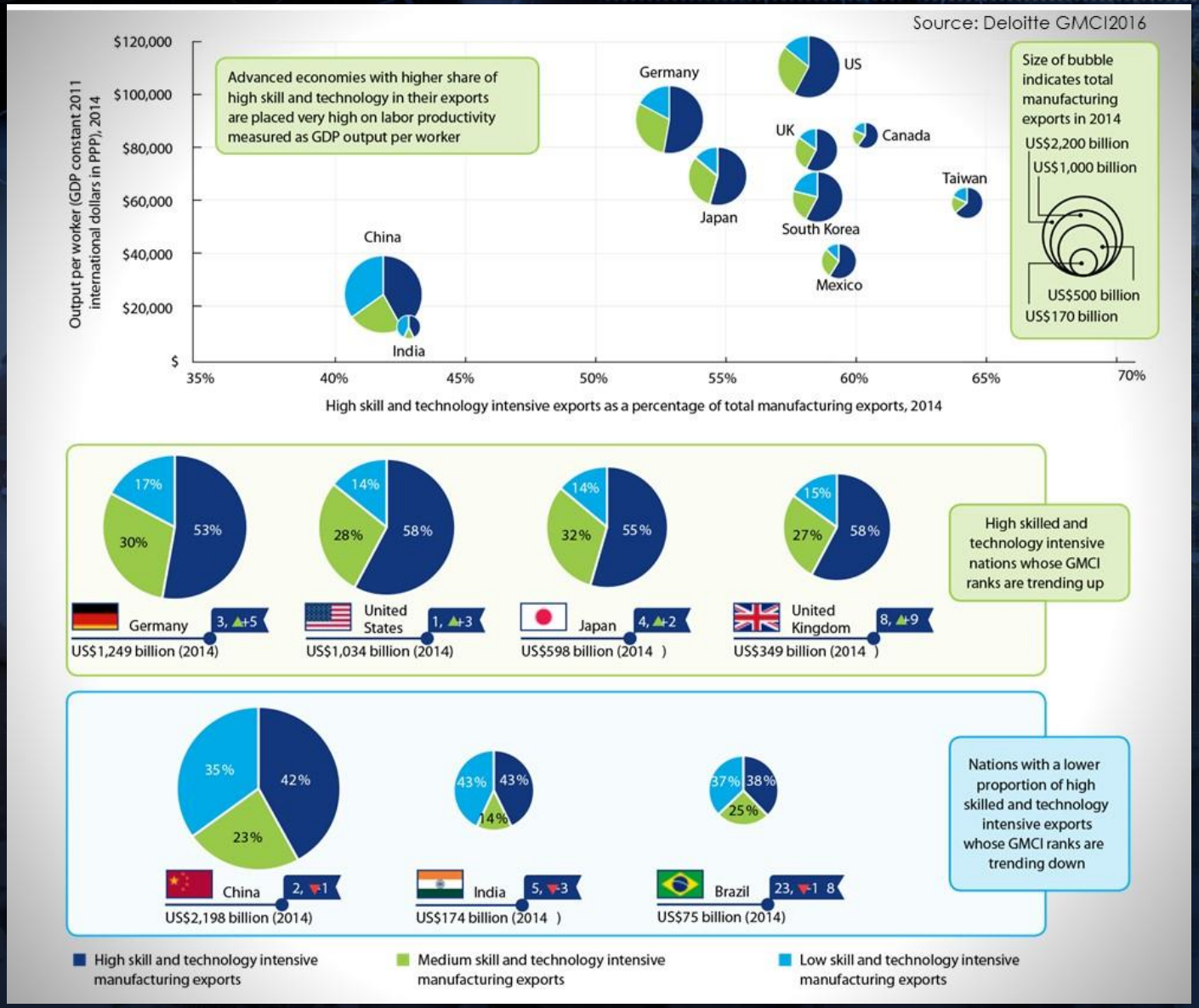

What do the people really need?

I.4.0 Stages of development

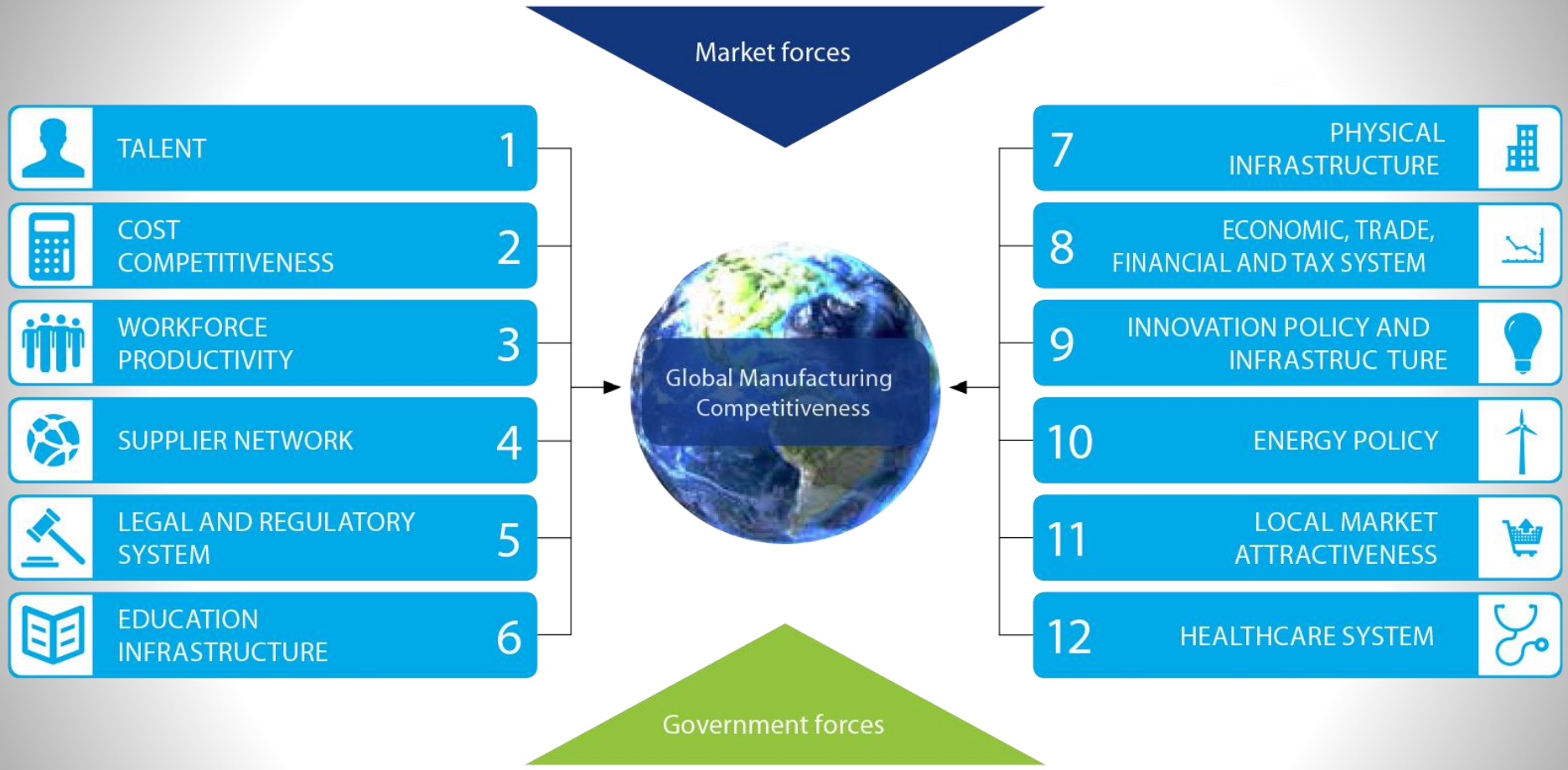


Source: Acatech, 2017

Ranking of manufactured goods exports from countries based on their technological intensity

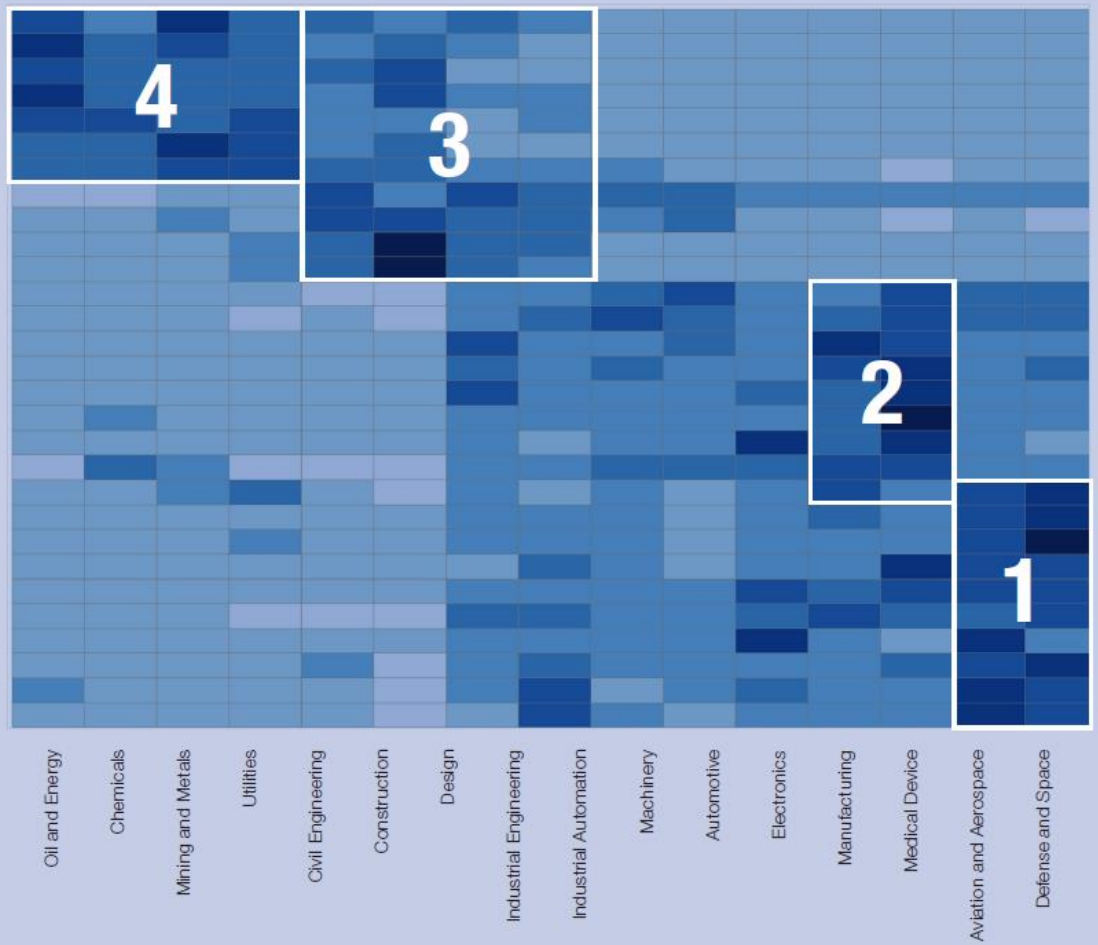


Message

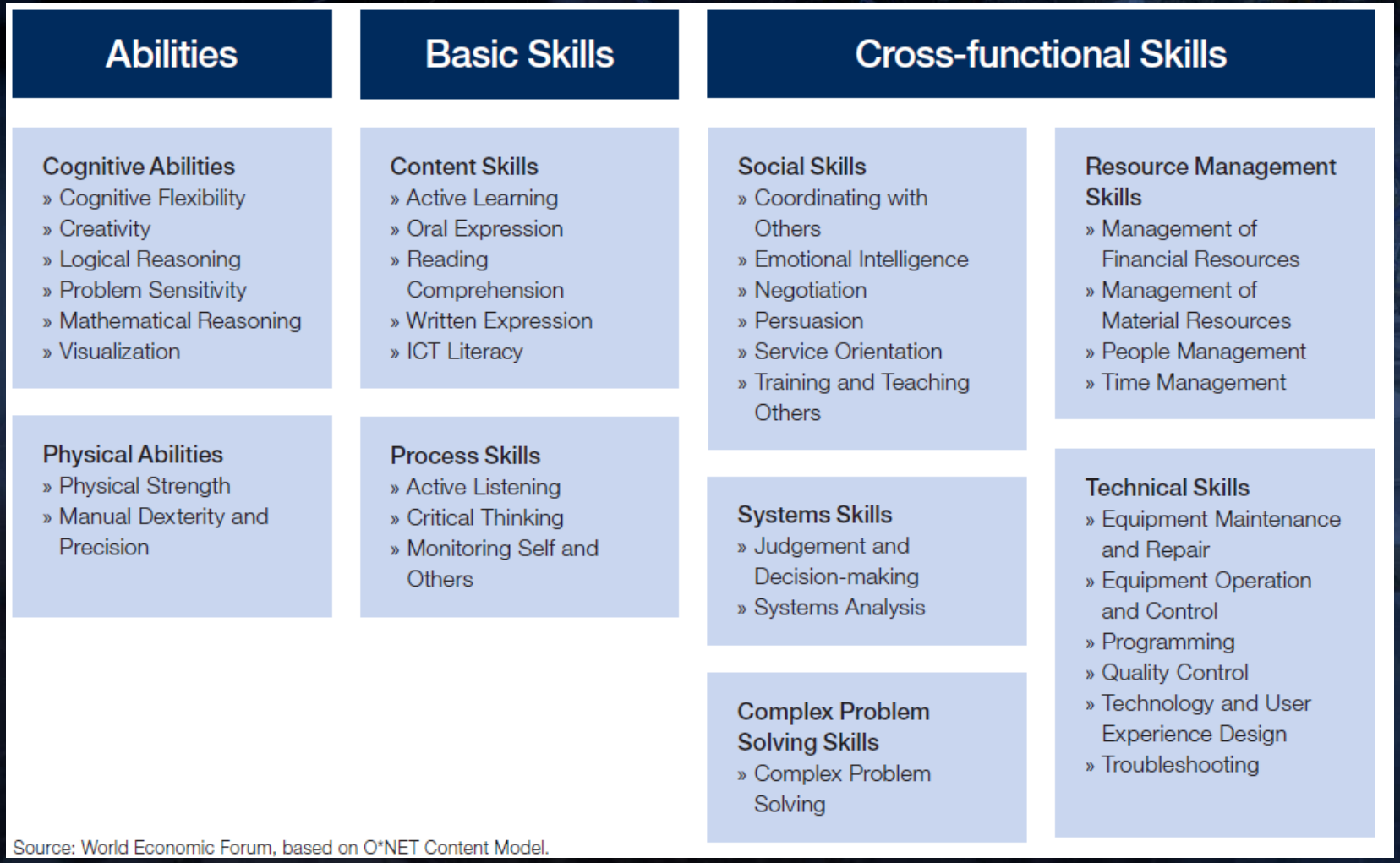


Source: Deloitte GMCI2016

Heatmap: Distribution of skills, mechanical engineers, different industries



Source: WEF, jan 2016



Source: WEF, janeiro de 2016

Source: Future of Job Survey, World Economic Forum, 2016.

30%

of the current jobs did not exist 10 years ago

65%

of children will work on jobs that do not exist today

Over 3 bn people work with some type of professional contract

Educação Inovadora

MBI em Educação para o Profissional do Futuro

Torneio de Situações de Aprendizagem

SENAI CHALLENGE

ENSINO MÉDIO CONECTE

SENAI 4.0

Despertar 4.0 | Agir 4.0 | Conectar 4.0

Engajamento e Referência

LABORATÓRIO Aberto SENAI

ENGENHARIAS

MBA SMART

RENOVAÇÃO DE PORTFÓLIO

FATURAMENTO COM

RECEITAS DE SERVIÇO

Conclusions .....

that I do not have and I do not feel that I will have them

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Immediate impact

- Increase of the geopolitic volatility
- Fast urbanization
- Mobile internet and Cloud technology
- Advancements in computing capacity and Big Data
- Crowdsourcing, shared economy and P2P plataforms
- Changes in the workplace environment and restructure of work flexibility
- Climate change, natural resource scarcity and the transition to a greener economy

2016-2017

- New sources of energy and technologies
- Internet of things
- Advanced manufacturing and 3D printing
- Longevity and the aging of societies
- New consumer cocerns over ethical issues and privacy
- Increasing women aspirations and financial power

2018-2020

- Advanced robotics and autonomous transportation
- Artificial intelligence and inteligente machines
- Advanced materials, biotechnology and genomics

How long will these changes take place?

Source: Future of Job Survey, World Economic Forum, 2016.

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