The Next Industrial Revolution
Industry 4.0

M.Sanne, October 2017

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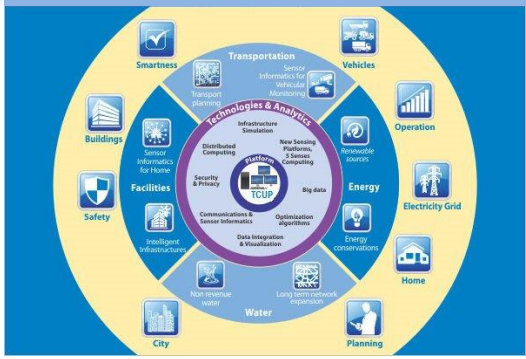
Innovation is accelerating to exponential levels by Catalytic Innovations e.g. Digitization/Digitalization

Catalytic Innovations

In the past	Recently in the world	CSIR Potential Answers
Photography	Atmospheric water /	
Automobiles	Desalination	Water filtering technologies
Electricity	Commercial Drones	Advanced sensor and optics
Airplanes	Software developers	HCD
Telephones	Mobile APPS	Software expertise development
	Trillion Sensor Future	Micro sensors
	3D printing	3D printing design and materials
	Cancer Immunotherapy	Breathalysers, Cellnostic, Biomimetics
	LEDs	LEDs (printed electronics)
	Big Data	Big Data Management
	Internet of things	Internet of things (sensors)
	Natural Gas	Natural Gas (materials research)
	Wind Power	Wind Power Technologies
	Solar Power	Solar Power Technologies
	Mass Energy Storage	HySA (Advanced materials)
	Micro Grid Conversion	Energy solutions
	Hyper speed transport	Transport solutions
	Contour Crafted Houses	Materials synthesis
	Driverless everything	Autonomous vehicles
	Electric everything	Advanced batteries
	Bio Factories	Bio manufacturing
	Micro Colleges	Learnership program
	Smart Homes/buildings	Smart device management
	Home Delivery	Drones and robotics
	24 Hour Cities	Robotics platforms and
	Senior Living	Pharmacy Automation
	<u>Digitalization</u>	<u>4th Industrial Revolution</u>

Cyber Physical Systems



Industry 4.0

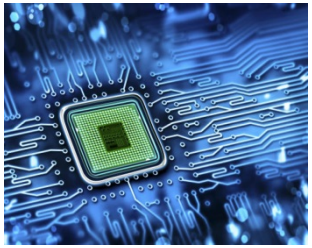
Cost Control/ efficiency
Competitive Positioning
Production capacity/ Flexibility
Improved client service
Monetizing the value chain

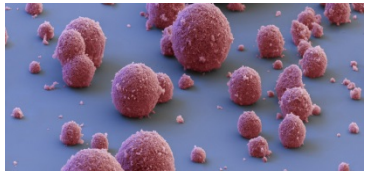
Internet of Things

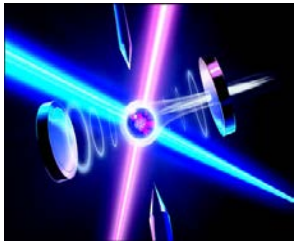
Technologies changing the face of Manufacturing

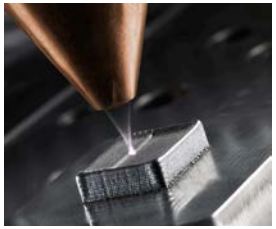
Advanced materials (Nano/Alloys)
Micro-nano electronics
Industrial biotechnology
Photonics
Additive manufacturing
Advanced robotics
Intelligent machines

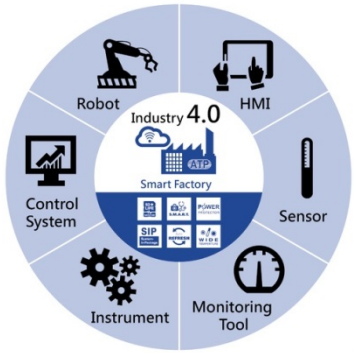
Big data
Predictive analytics
Cloud computing
Embedded sensors
Augmented reality
Internet of Things
Industry 4.0











A key driver for Re-Industrialisation is that the barriers for entry into manufacturing are becoming lower (democratization of manufacturing)

Manufacturing tools have become smaller and less expensive, democratizing access to sophisticated design and tooling capabilities for use in prototyping

Future

Makerbot 3D printer

Voltera circuit printer

Othermill CNC machine

uArm miniature industrial robot

Current

Injection molding machine

PCB board factory

Traditional CNC machine

Traditional industrial robot

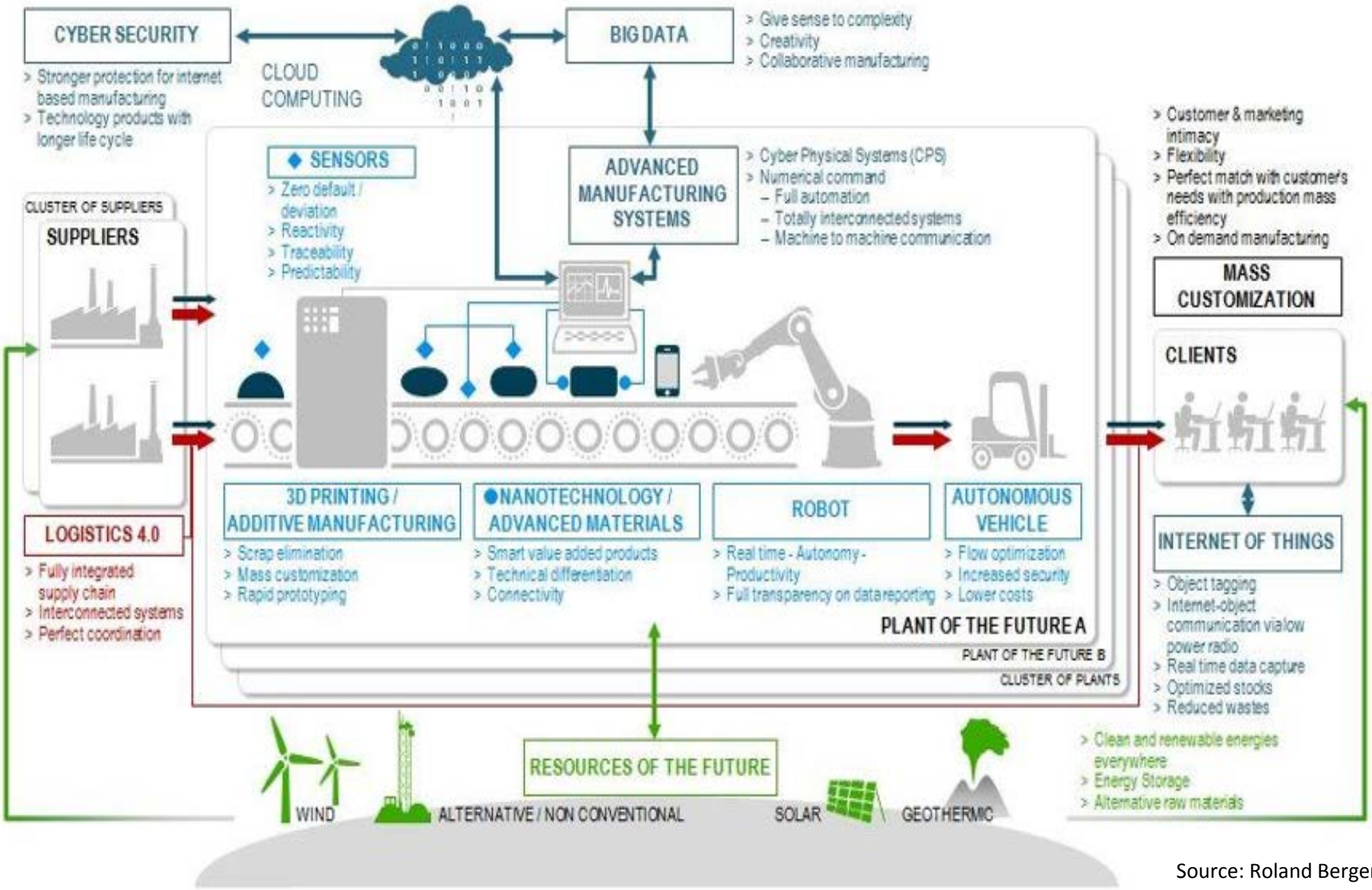
Source: Centre for the Edge, Deloittes University Press

Possible Role Models of High Tech Companies in USA and China

Dexmo

Local Motors

Industry 4.0 in a 'nutshell'



Source: Roland Berger

Product Life Cycle Management as a key enabler

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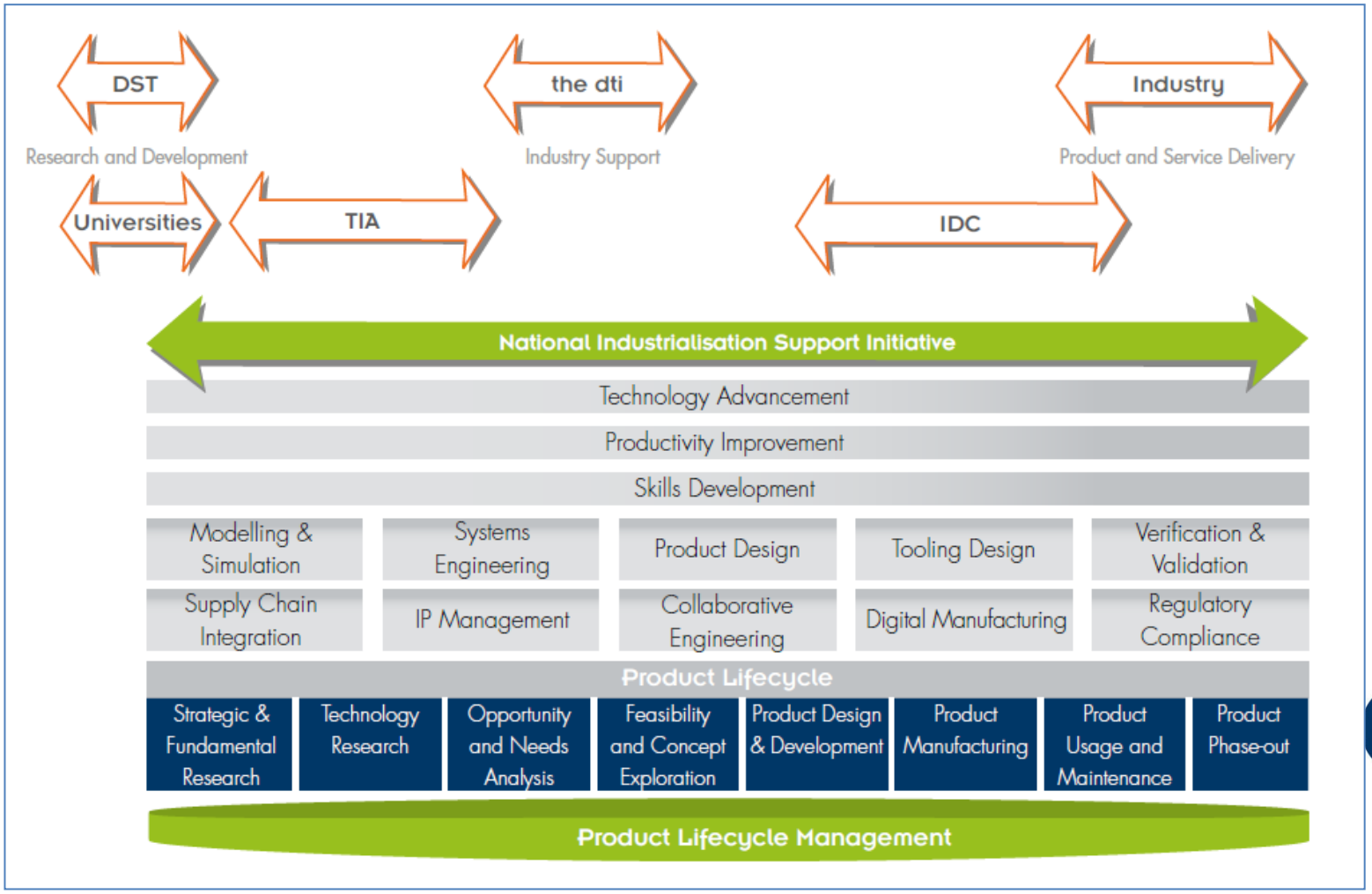
CSIR Industrialisation Support Initiative

- The CSIR National Industrialisation Support Initiative connects local and global industry and industrialisation partners



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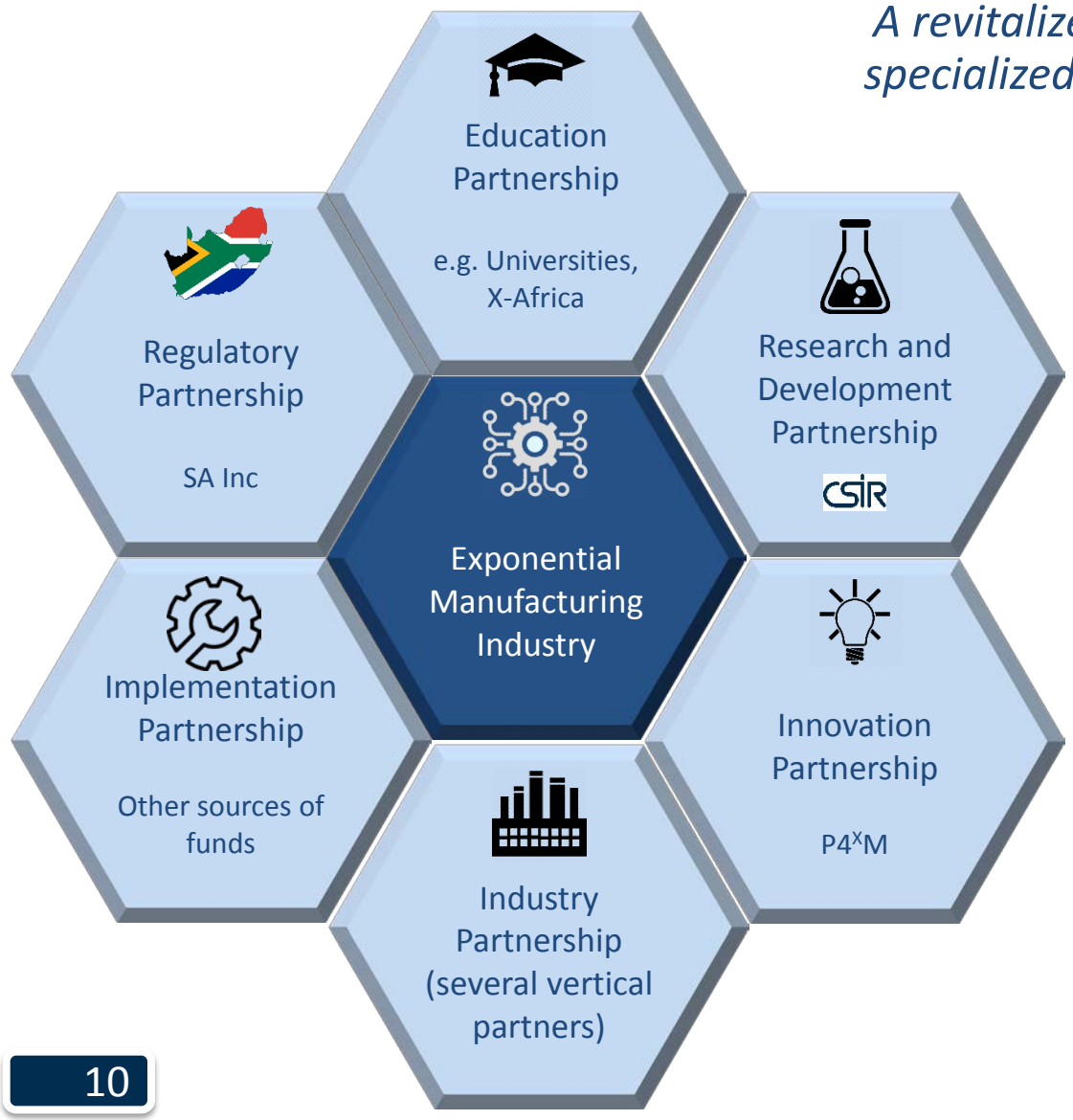
Partnerships in SA manufacturing/industry ecosystem

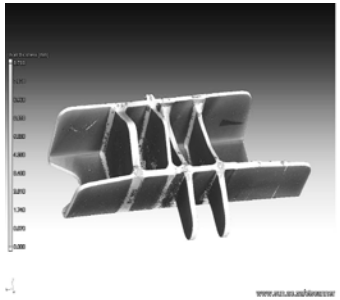


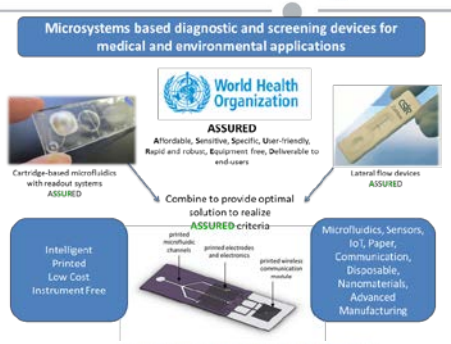
A revitalized manufacturing industry requires specialized partnerships focused on deliberate execution

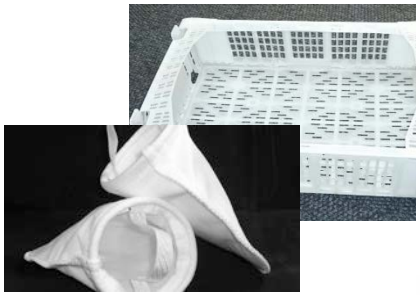
- ***High*** growth potential in select industry verticals to enable the creation of South African OEM's in globally relevant market sectors;
- ***Constant Innovation*** to convert new ideas backed by future-relevant R&D to rapid and effective commercialisation
- ***Effective implementation*** within existing regulatory frameworks to accelerate societal, financial and environmental impact;
- ***Specialised*** contributions within clearly delineated partnerships across all six ecosystem domains;
- ***Holistic*** approach to global relevance through deliberate development of a competitive ecosystem

From Materials to Products

From Materials To Product







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Specialist devices

Next generation Inspection System

- Internet of Things
- Miniaturisation
- Augmented Reality
- Others?

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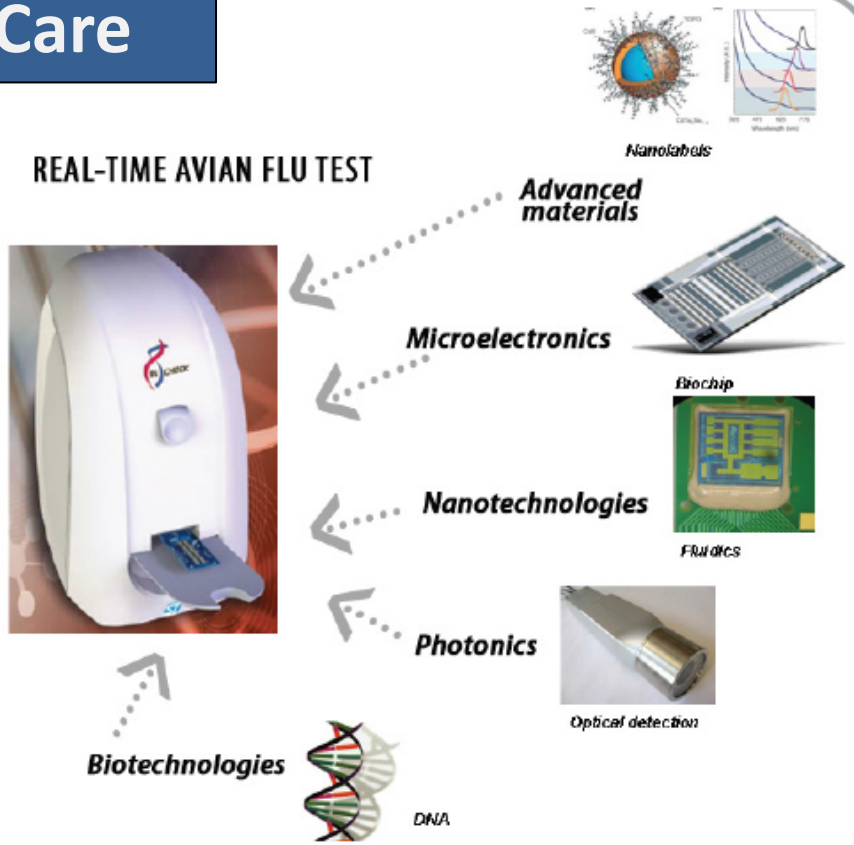
Health Point of Care

SOCIETAL CHALLENGES

Effective timely detection and diagnostic systems



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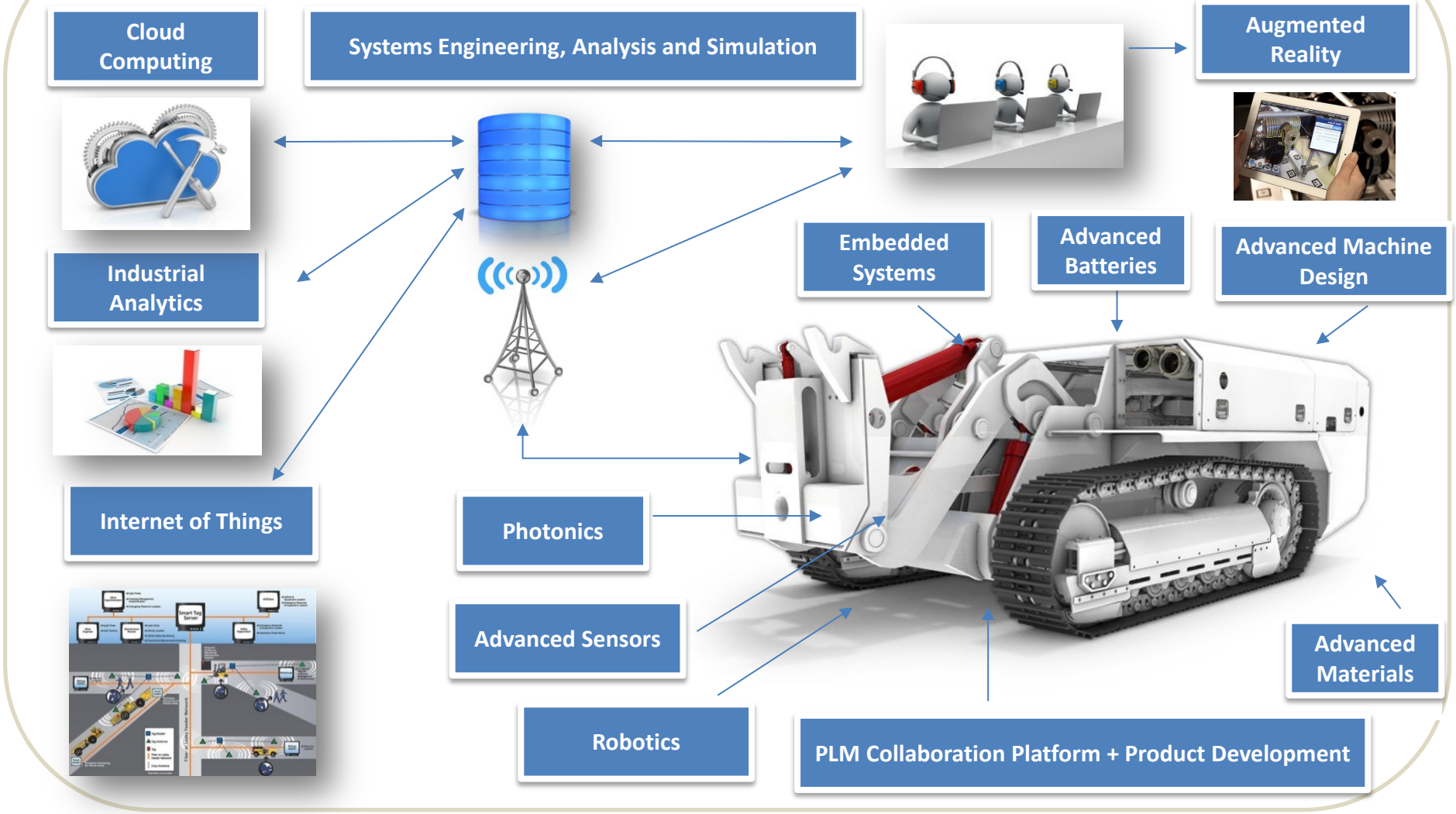
Technology Convergence & Integration

Mining Robotics Platform / "Digital Mining"



AIRBNB TECH STACK ANALYSIS

How to build the world's largest "hotel" business, without any rooms!

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