THE FUTURE OF WORK AND ROBOTICS

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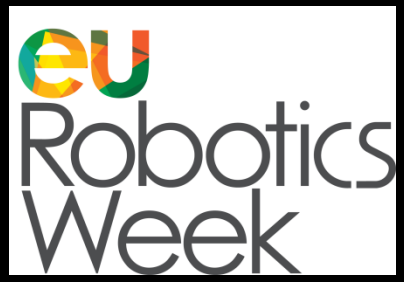
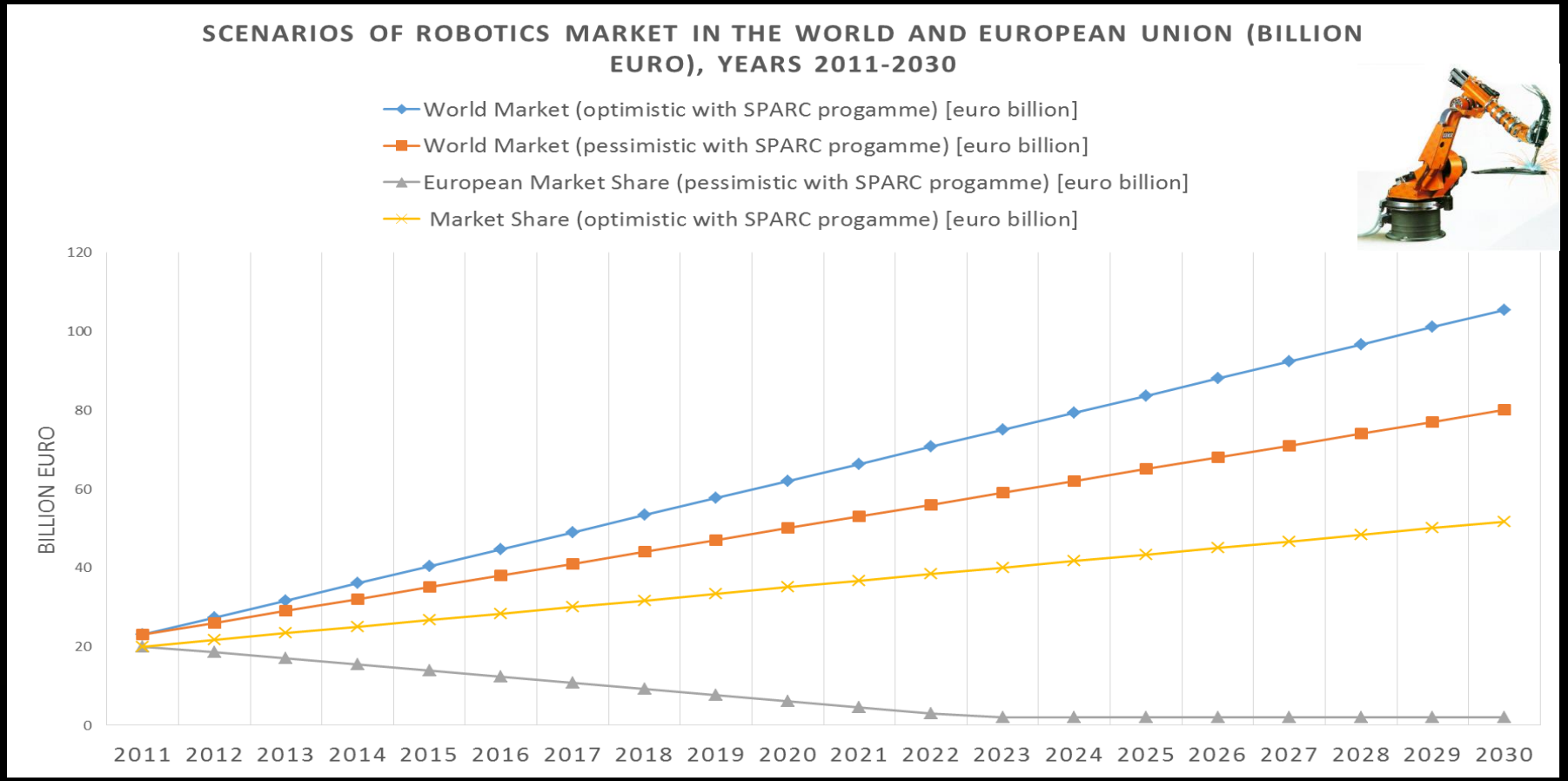
EU ROBOTICS STRATERGY 2020

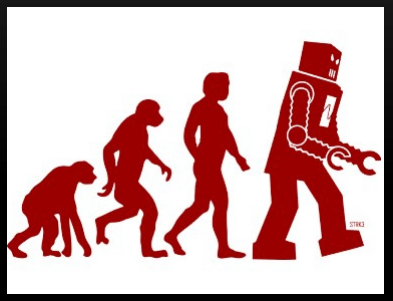
“Robotics Technology will become dominant in the coming decade. It will influence every aspect of work and home. Robotics has the potential to transform lives and work practices, raise efficiency and safety levels, provide enhanced levels of service and create jobs. Its impact will grow over time as will the interaction between robots and people.”

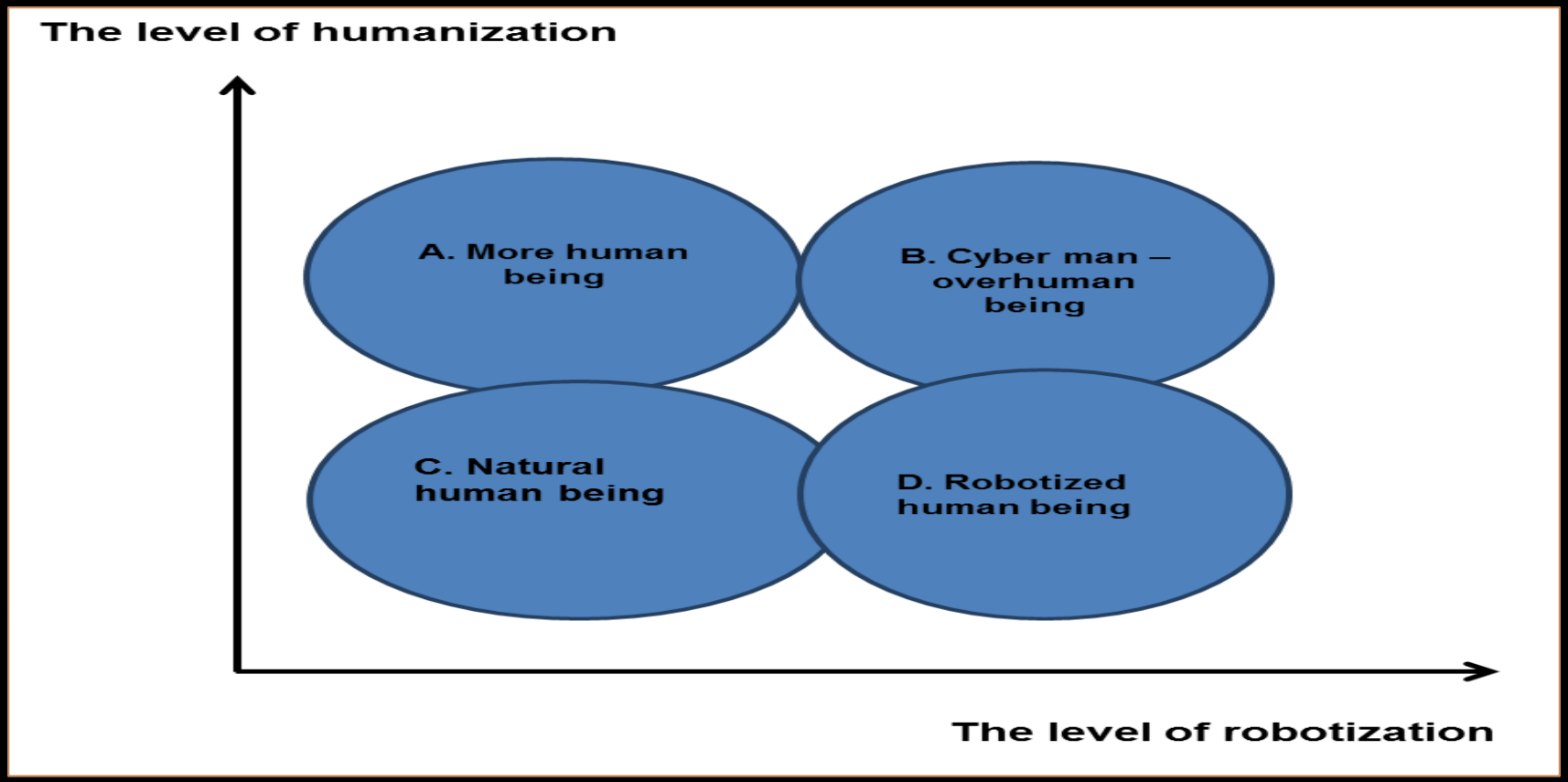


SCENARIOS OF ROBOTICS MARKET IN THE WORLD AND EUROPEAN UNION (SPARC 2014B, ROBOTICS IN EUROPE. INTRODUCTION, WEB: HTTP://WWW.SPARC-ROBOTICS.NET/ROBOTICS-IN-EUROPE/).

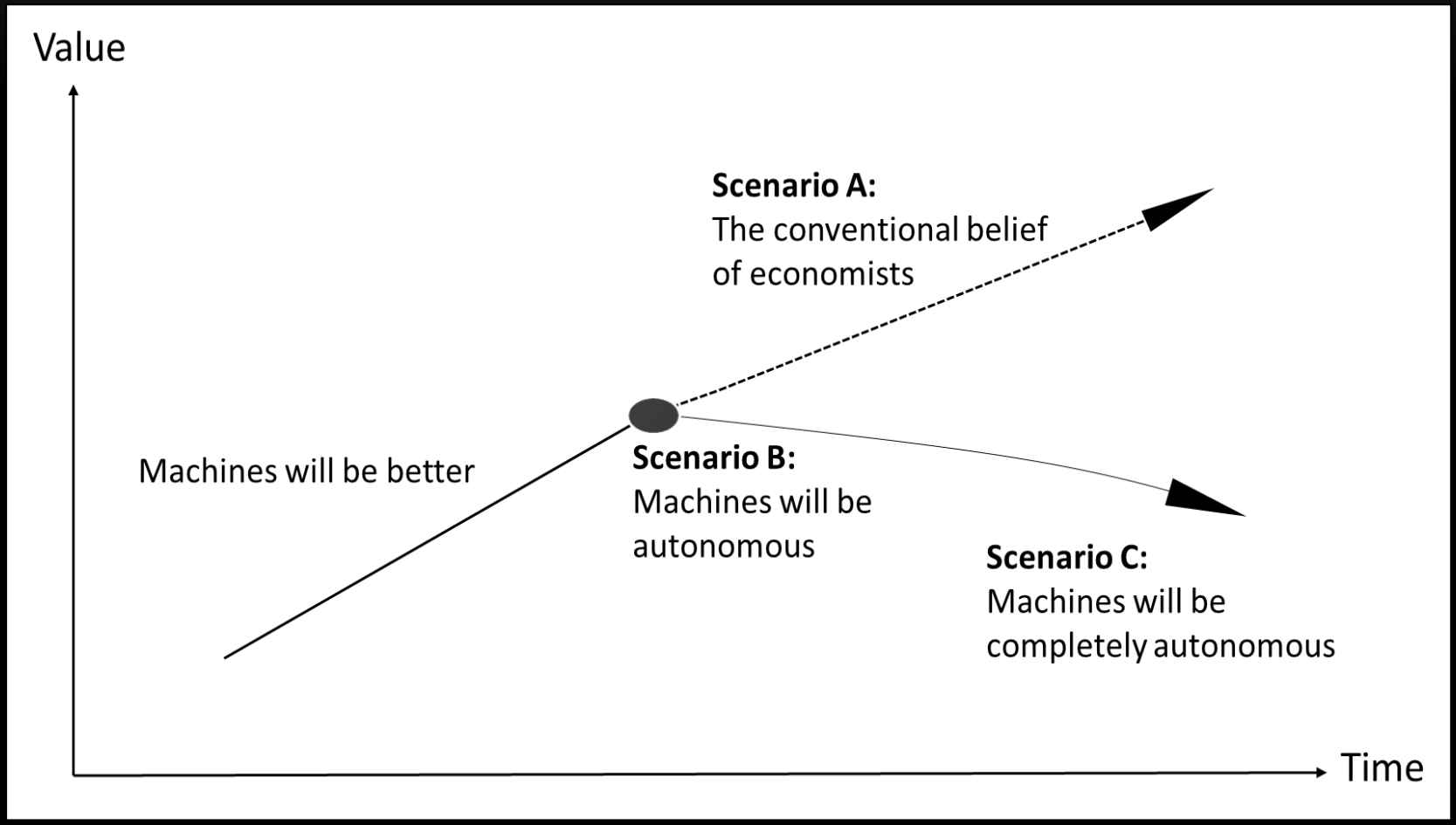


ROBOTICS AND HUMAN BEING: 4 SCENARIOS

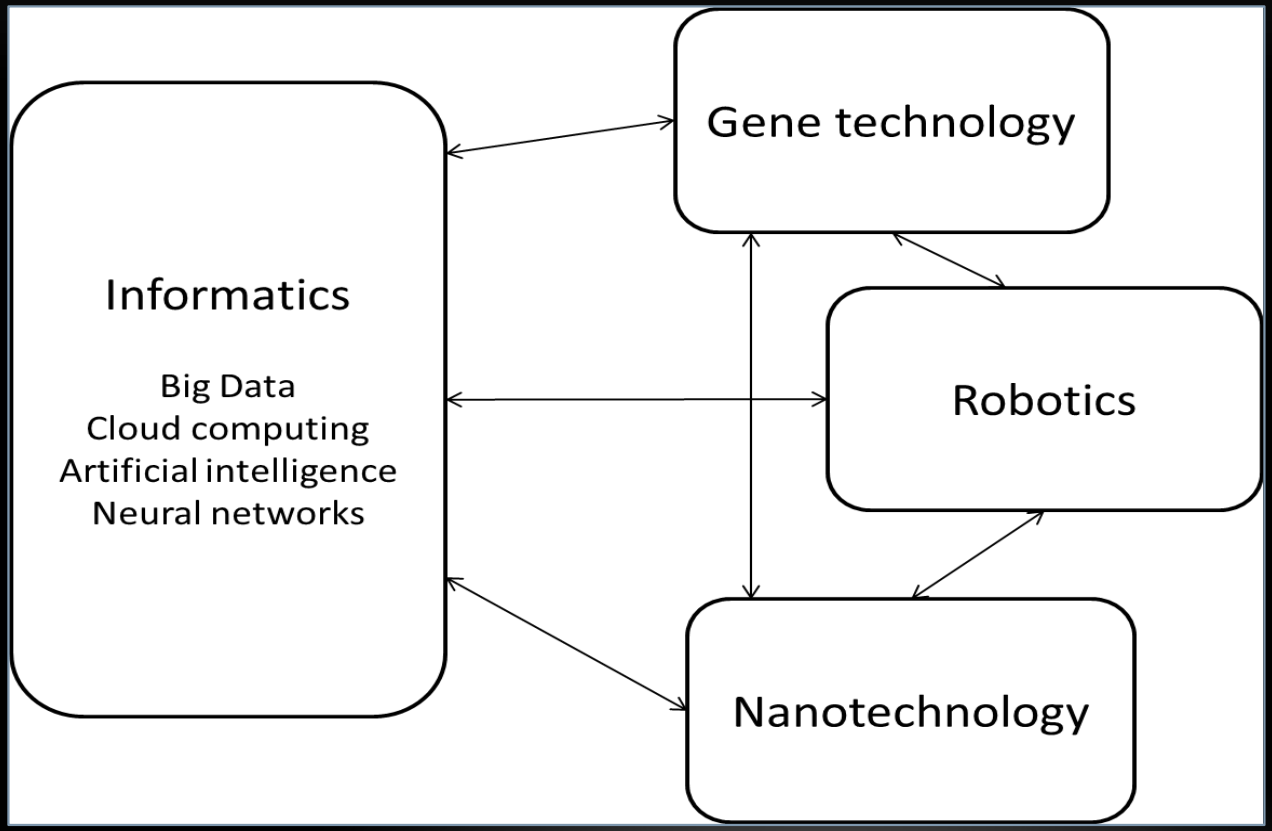




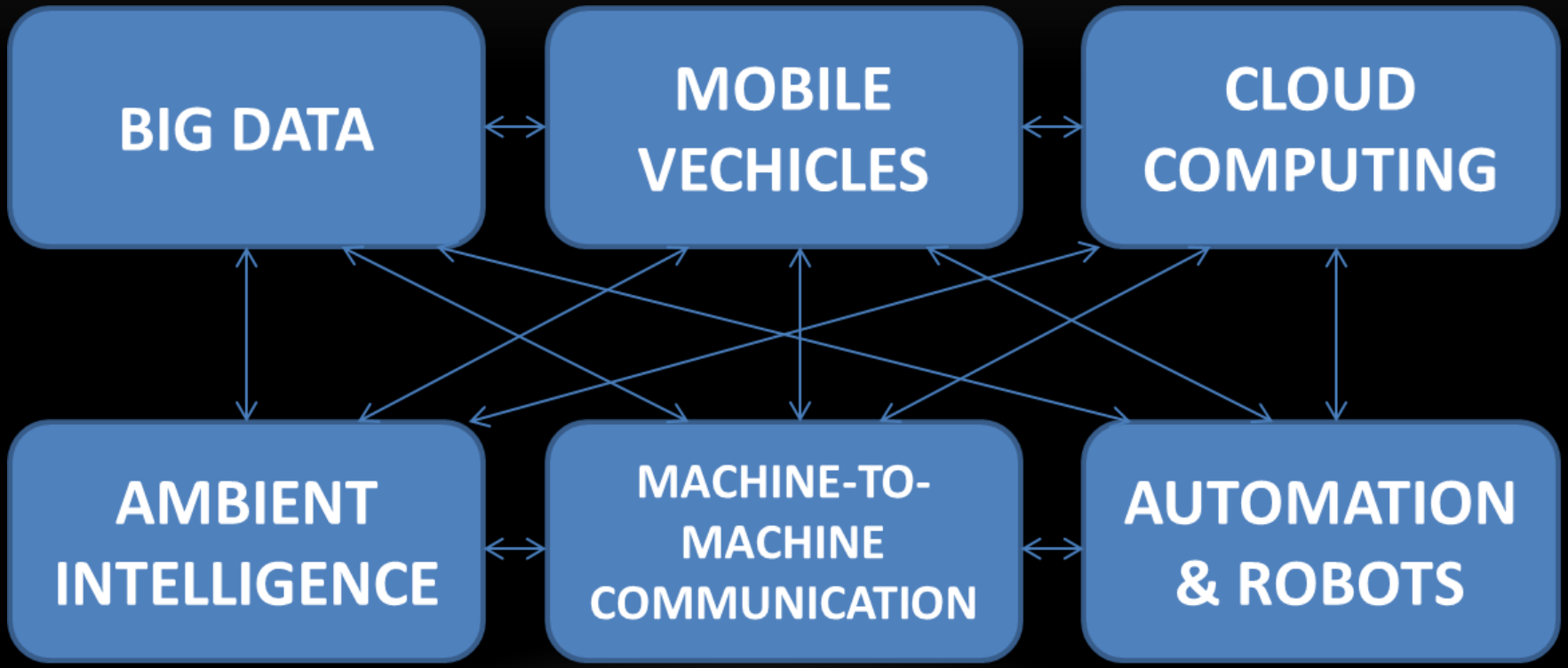
ROBOTICS AND WORK: TWO BASIC SCENARIOS OF VALUE CREATION



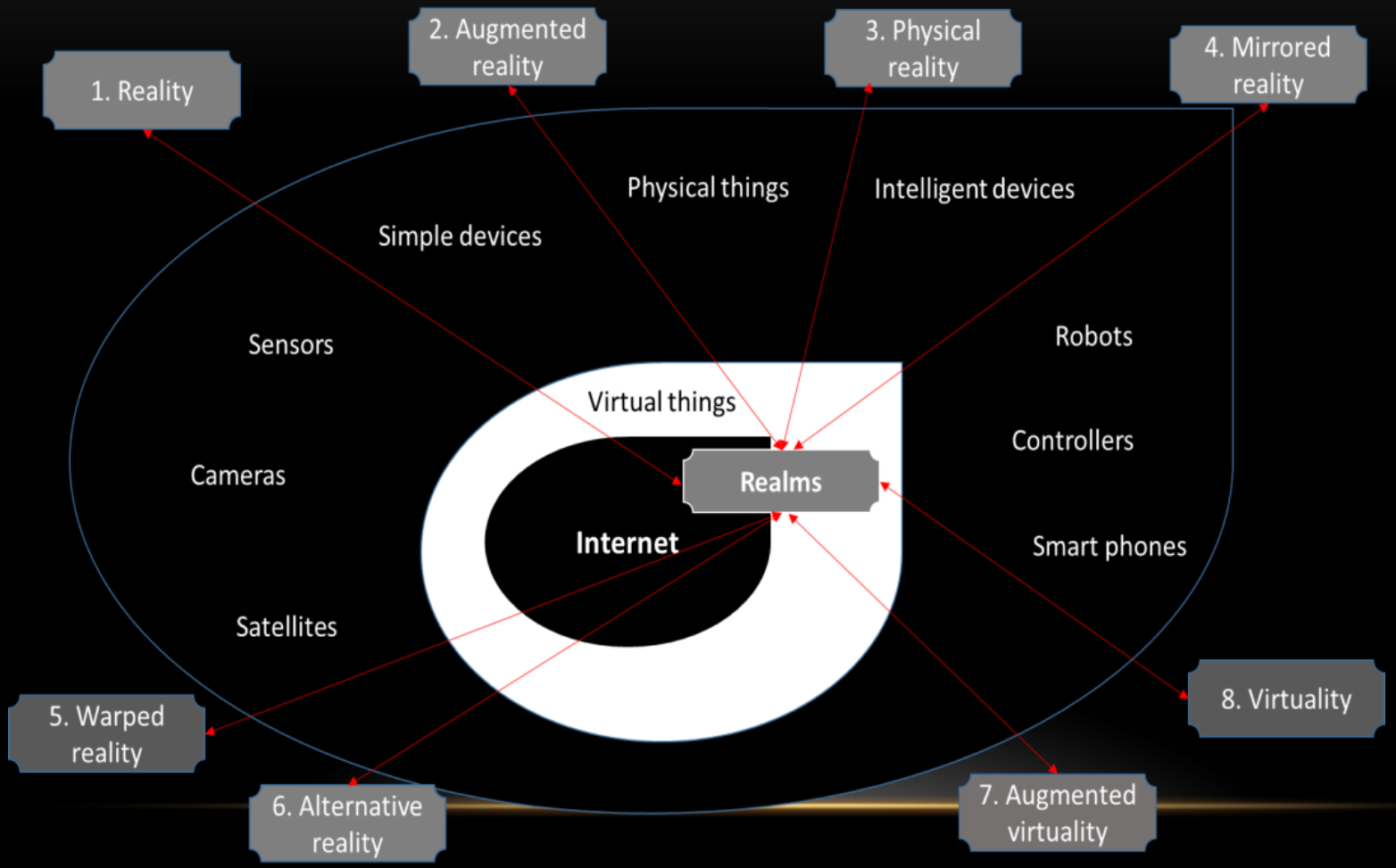
GRIN TECHNOLOGY WAVES: INTERCONNECTIONS BETWEEN ROBOTICS AND OTHER TECHNOLOGY WAWES



COMPLEX SYSTEMIC ELEMENTS OF UBIQUITOUS R/EVOLUTION



INTERNET OF THINGS AND ”NEW REALITIES”



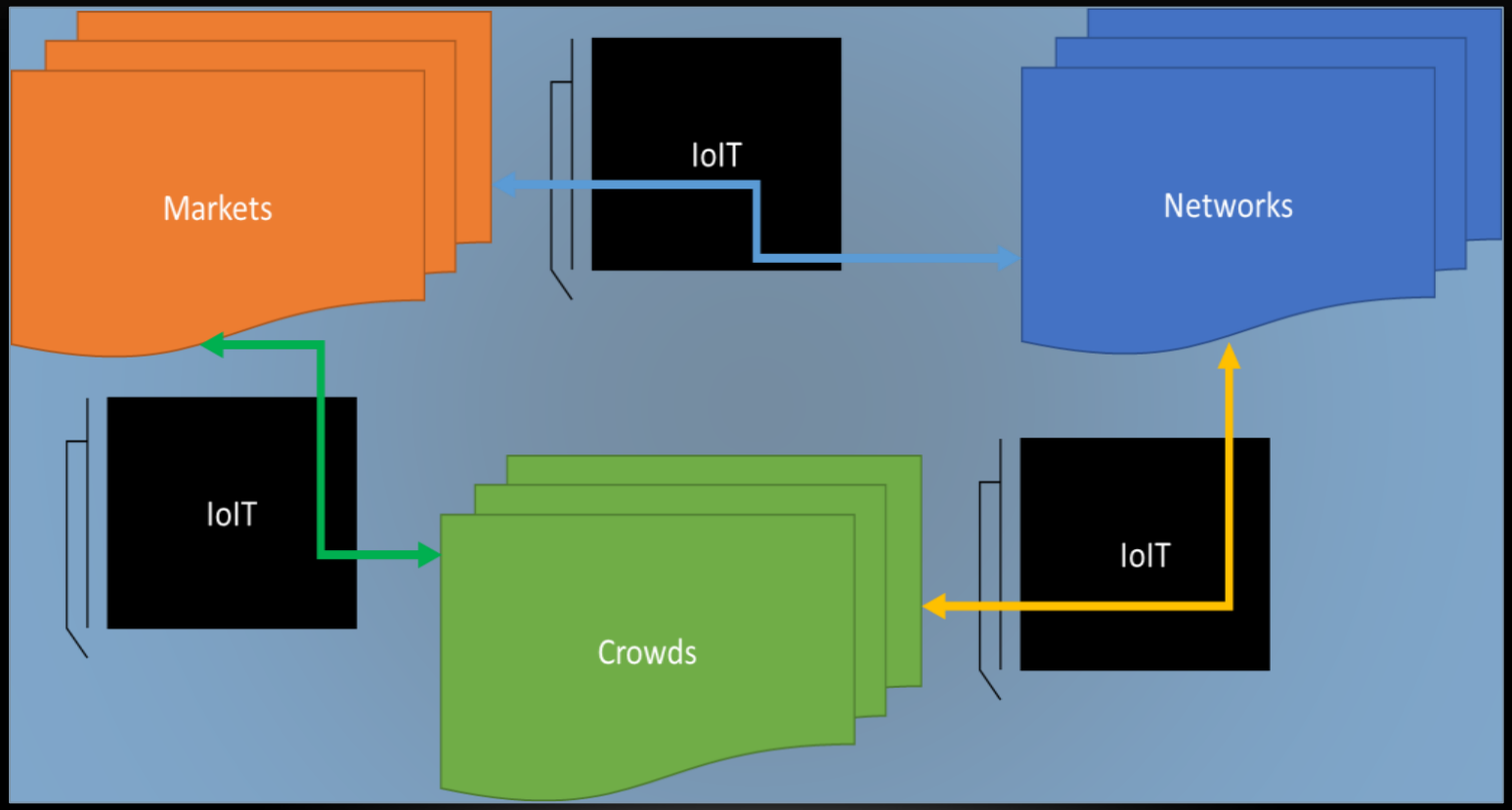
Source: Modification from Chen & Hu 2013, p. 161 and Pine II & Korn 2011.

NEW REALITY AFTER UBIQUITOUS REVOLUTION

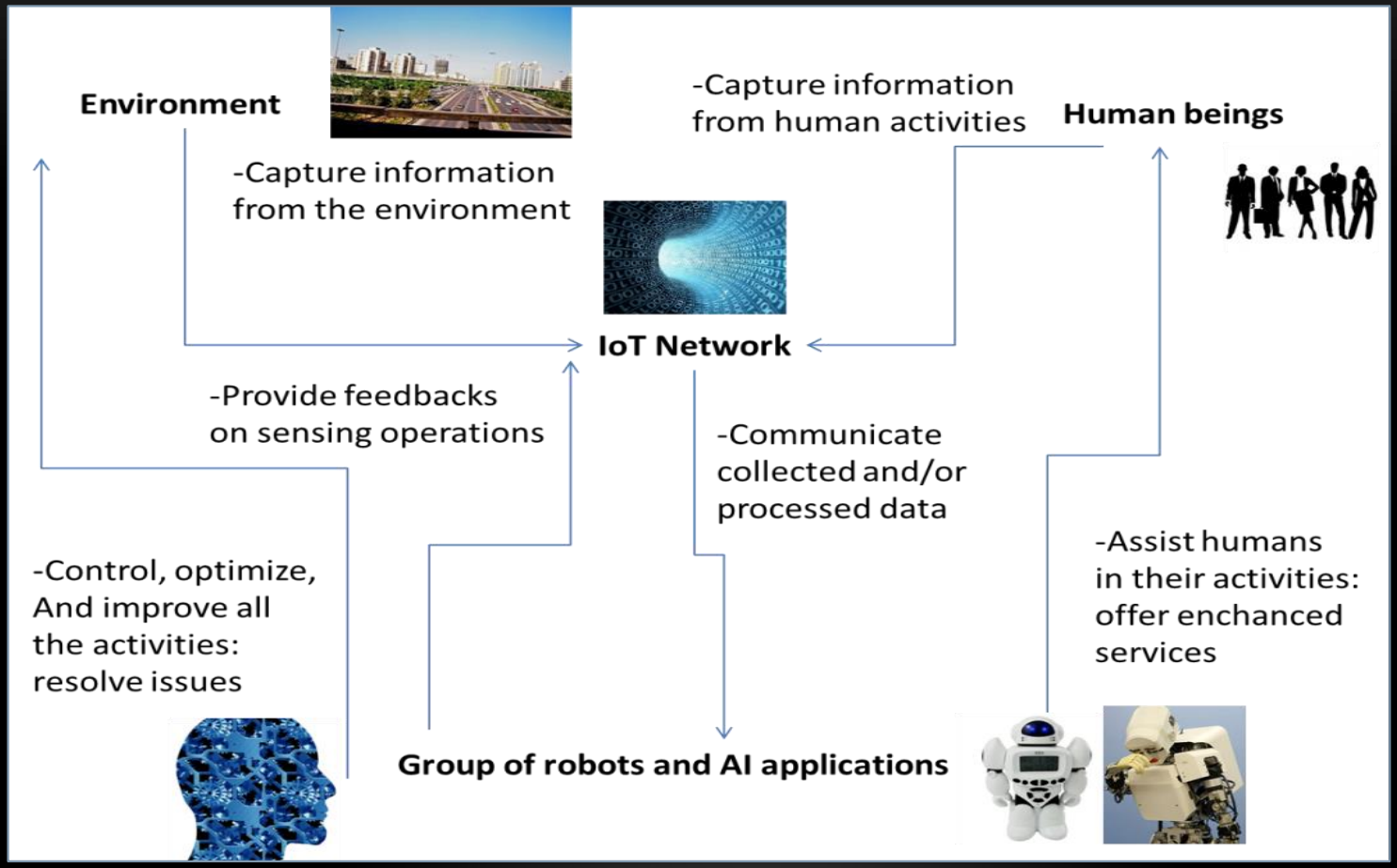
Variables			Realm
1. Time	Space	Matter	Reality
2. Time	Space	No-matter	Augmented reality
3. Time	No-space	Matter	Physical reality
4. Time	No-space	No-matter	Mirrored reality
5. No-time	Space	Matter	Warped reality
6. No–time	Space	No-matter	Alternative Reality
7. No-time	No-space	Matter	Augmented Virtuality
8. No-time	No-space	No-matter	Virtuality

Source: Pine II & Korn 2011, p. 17

NEW ECONOMY: INTERACTION OF MARKETS, NETWORKS AND CROWDS VIA IOT



IOT SCENARIO AND ROBOTICS



Source: Modification of Grieco et al. 2014, p. 34

ROBOTICS ROADMAP (HAIDEGGER ET AL. 2013, P. 1216)

High

Degree of Autonomy

Low

Service robots

- Autonomous agents
- Comprehension of environment through models
- Communicate with environment
- Automatic generation of programs based on tasks planned
- Understands human actions
- Follow human social norms
- Mimic human abilities and shape

- World Model based on fixed environmental data
- Task specific commands
- Implicit programs
- Multisensory information procession
- Automatic path plannnig

Industrial robots

- Caged environment
- A priori task definition
- Automatic execution of explicit programs

Structure, simple tasks

Unstructure, Complex tasks, Natural human interaction

Degree of Complexity
(Environment. Task and Human Interaction)

DETAILED ROBOTICS ROADMAP (EURON 2004)

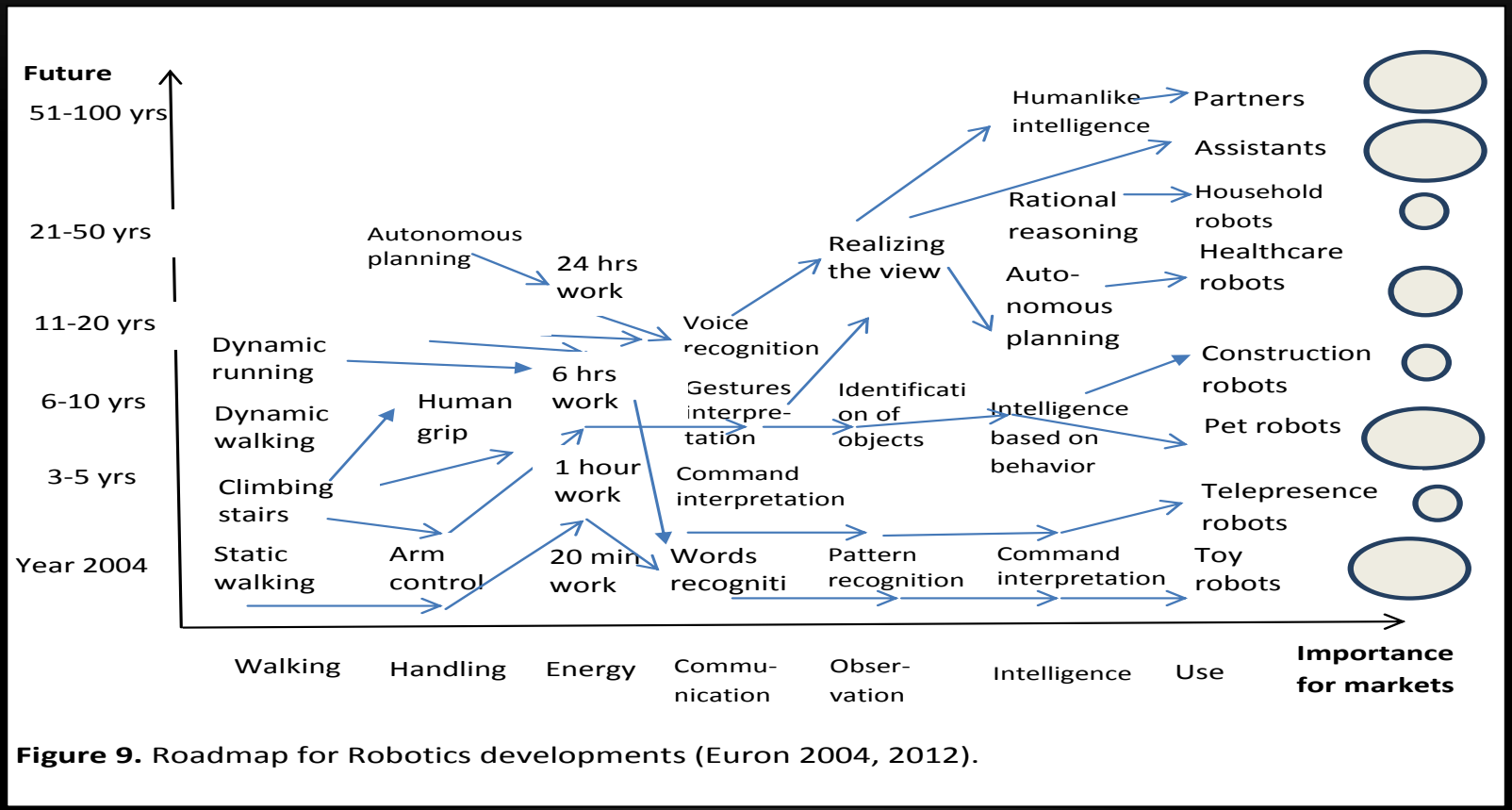
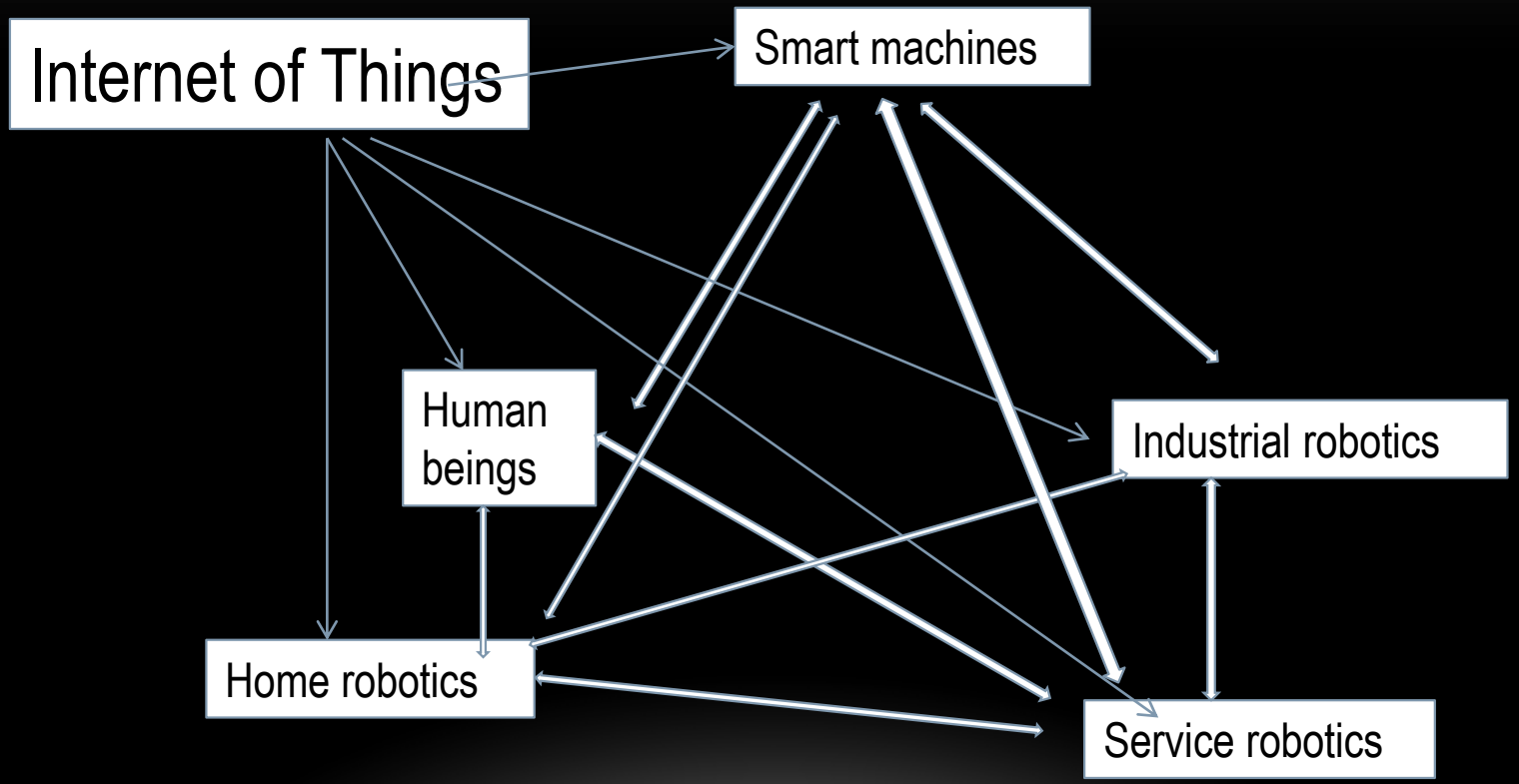
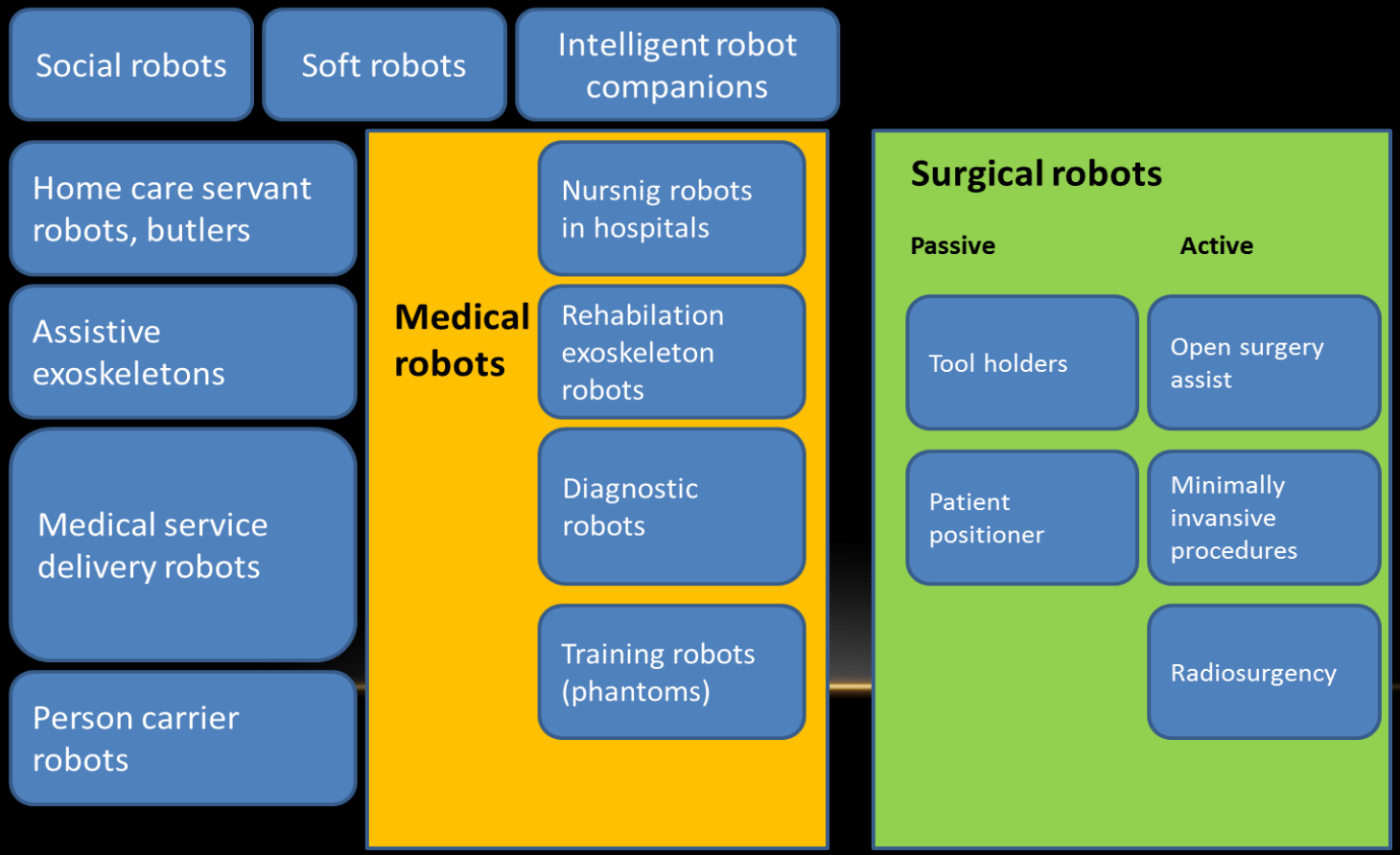


Figure 9. Roadmap for Robotics developments (Euron 2004, 2012).

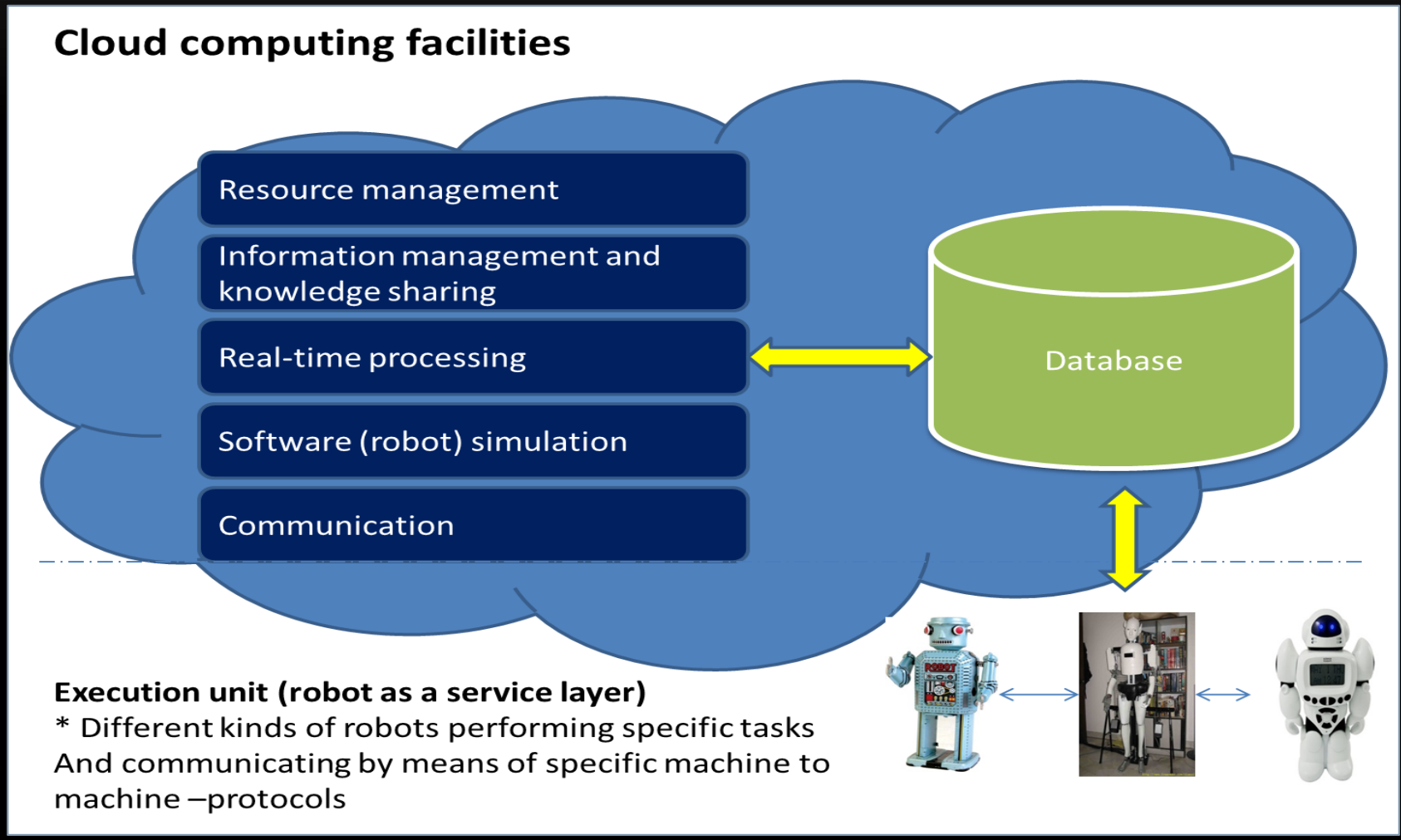
INTERNET OF THINGS AND HUMAN-TO-MACHINE AND MACHINE-TO-MACHINE INTERACTIONS



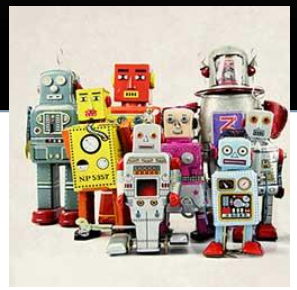
EXAMPLE: ROBOTICS IN HEALTH CARE SECTOR: CATEGORIES OF MEDICAL/NON-MEDICAL PERSONAL SERVICE ROBOTS (HAIDEGGER ET AL. 2013, P. 1217)

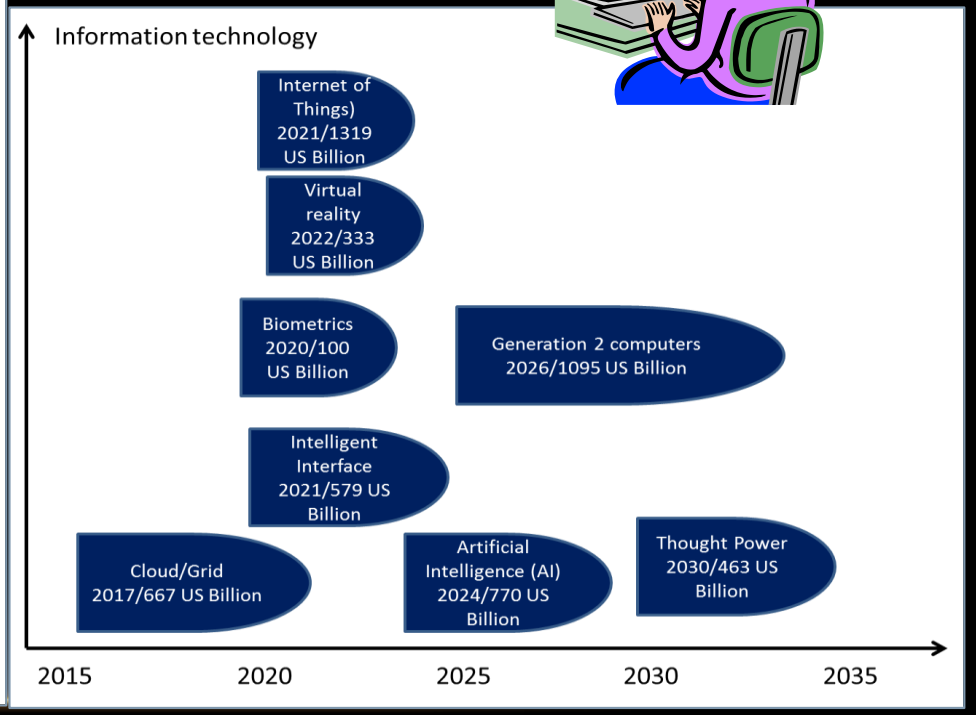


ROBOT AS A SERVICE LAYER (CHIBANI ET AL. 2013)



TECHNOLOGY ROADMAPS RELEVANT FOR ROBOTICS: DIGITALIZATION, ROBOTICS, MANUFACTURING AND INFORMATION TECHNOLOGY





THE EVOLUTION OF INTELLIGENCE EXPLOSION (MODIFICATION OF BOSTROM 2014, P. 70).

AI era

Singularity society

Information society

Knowledge society

Ubiquitous knowledge society

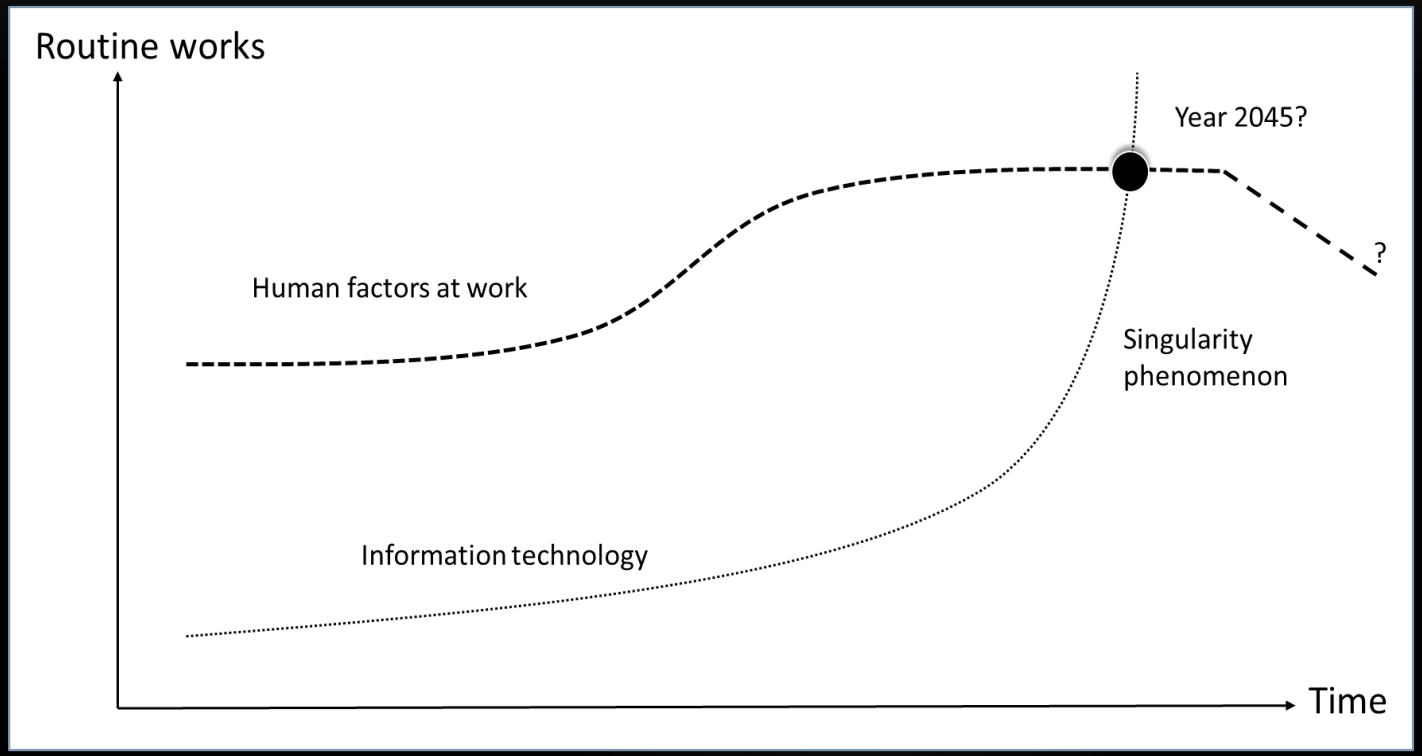
Mouse

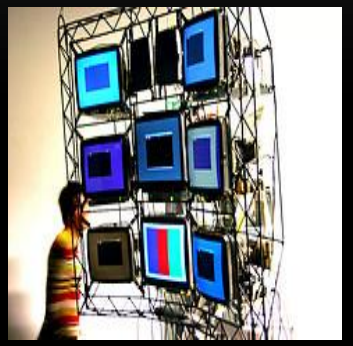
Village idiot

Chimp

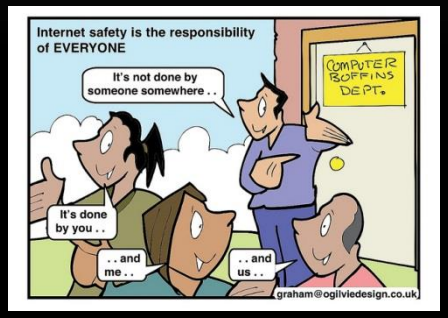
Einstein

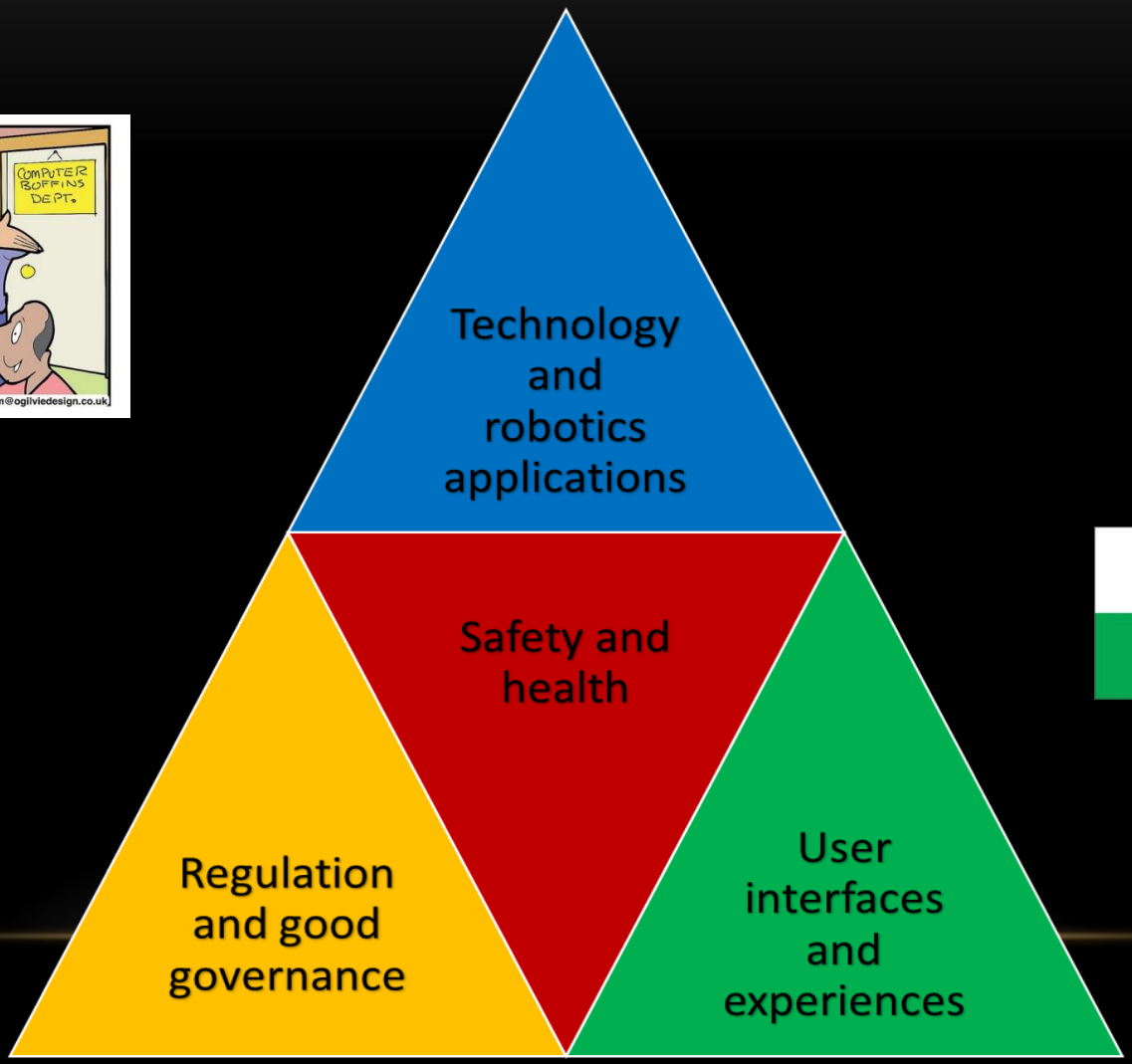
SINGULARITY SCENARIO (FORD 2009)





ROBOTICS AND AI CHALLENGES: SAFETY AND HEALTH TRIANGLE





THANK YOU FOR YOUR ATTENTION!

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