MOBILITY ENERGY ENVIRONMENT

The future moves us.

Socio-economic transformations in the Fourth Industrial revolution

Andrea Ricci
Institute of Studies for the Integration of Systems

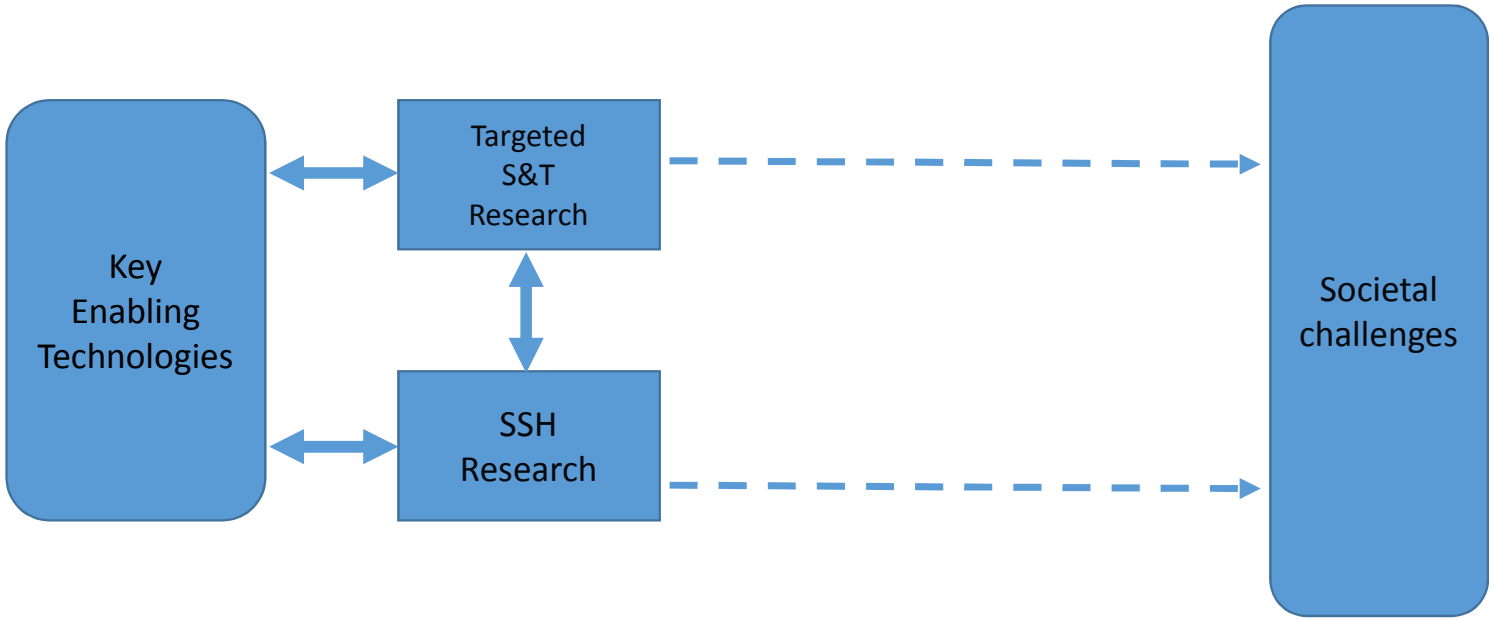
Social Sciences and Humanities for a changing Europe
16-17 November 2017, University of Bologna

Innovation for sustainability ISINNOVA

An old story…
Embedding SSH in H2020 (?)

- Fully fledged specific SSH topics (research *in* SSH)
- SSH related tasks under different sectors/topics (research *with* SSH)
- SSH fully integrated in project teams
  - Multi- Vs Inter- Vs Trans-disciplinarity

Integrating (disciplinary) knowledge



Key Enabling Technologies

- Micro/nano electronics
- Nanotechnologies
- Industrial biotechnologies
- Advanced materials
- Photonics
- Advanced manufacturing technologies

The 10 top technologies of the future

2014	2015
1. Body adapted wearable electronics	1. Fuel cell vehicles
2. Nanostructured carbon composites	2. Next-generation robotics
3. Mining metals from desalination brine	3. Recyclable thermoset plastics
4. Grid scale electricity storage	4. Precise genetic-engineering techniques
5. Nanowire lithium-ion batteries	5. Additive manufacturing
6. Screenless display	6. Emergent artificial intelligence
7. Human Microbiome Therapeutics	7. Distributed manufacturing
8. RNA-based Therapeutics	8. 'Sense and avoid' drones
9. Quantified Self (Predictive Analytics)	9. Neuromorphic technology
10. Brain-computer Interfaces	10. Digital genome

Adapted from World Economic Forum, 2014 & 2015

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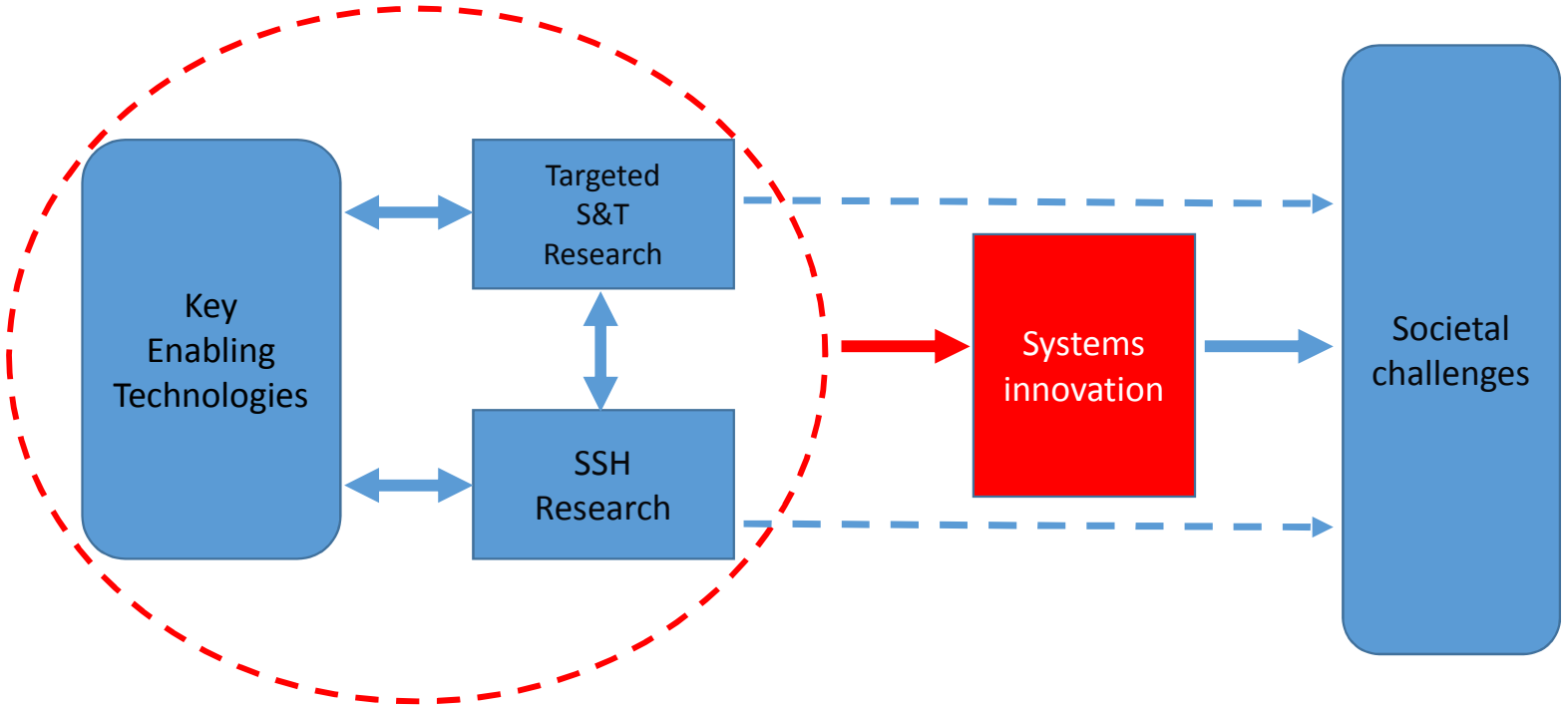
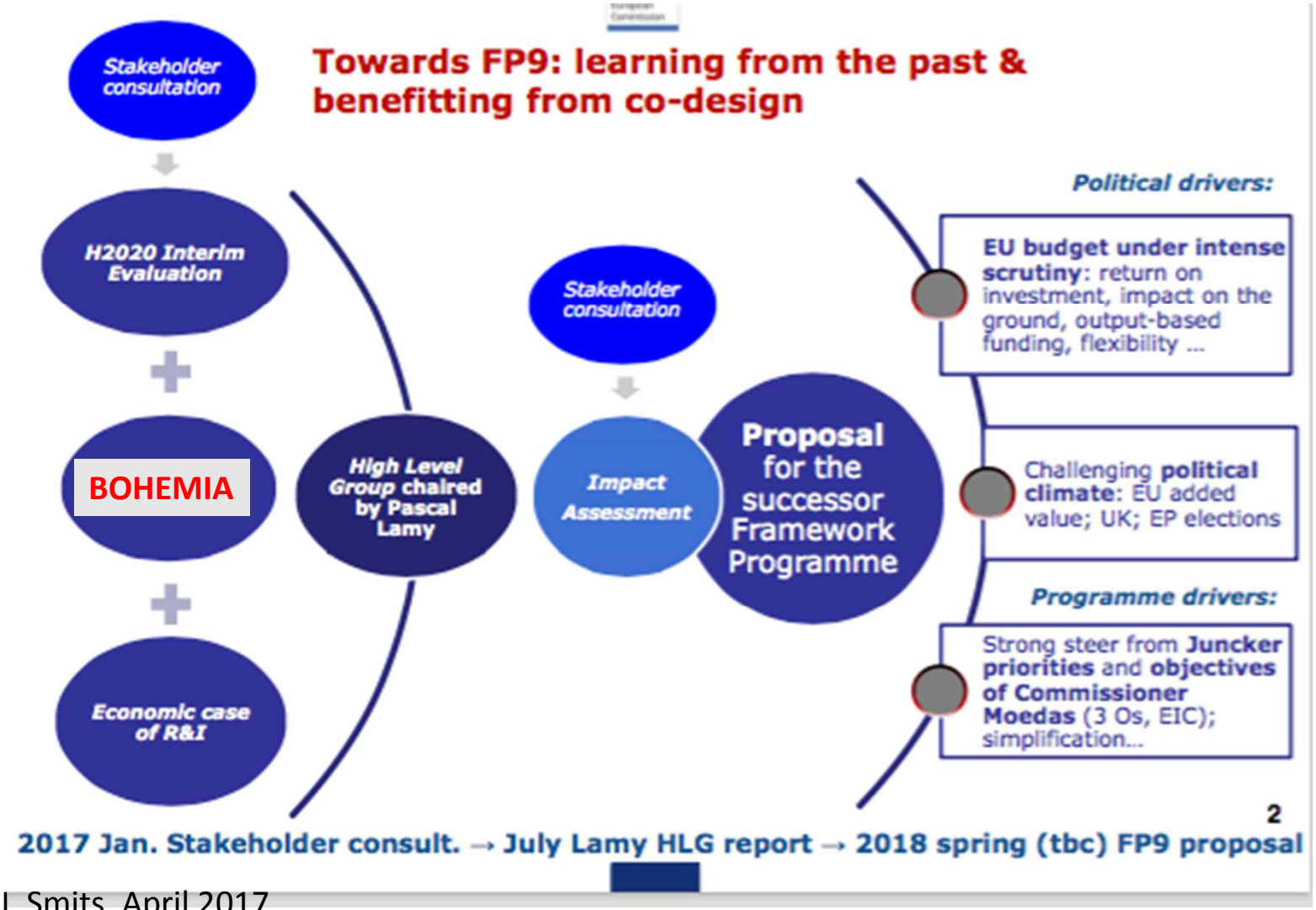


Towards a mission-oriented FP9?

BOHEMIA

Beyond the Horizon. Foresight in Support of the Preparation of the EU‘s Future Policy in Research and Innovation (BOHEMIA)

A. Ricci – 17.11.2017



Source: R-J. Smits, April 2017

BOHEMIA – background, purpose and objectives

- A strategic foresight study to contribute to the proposal for FP9
  - ✓ Research results of FP have an Impact in society ~5-10 years after its completion
  - ✓ Major challenges at the time horizon ~2035 as starting point
  - ✓ Taking into account openness and variability of future contexts
- Objectives
  - ✓ Draw a picture of possible alternative futures setting the societal, economic and political conditions and boundaries for EU R&I policy
  - ✓ Describe possible future evolution of socio-economic as well as of scientific and technological challenges, needs and opportunities
  - ✓ Suggest issues which could be addressed by EU R&I policy and funding

BOHEMIA

- **Phase 1:** Extensive review of available foresight to produce meta-scenarios relevant for Europe and deeper insights in topical fields (published June 2017)
- **Phase 2:** Delphi survey to gain insights on future technologies, societal issues, and R&I practices based on the scenarios (completed in Summer 2017)
- **Phase 3:** Analysis and policy recommendations (ongoing)

The report describes a range of futures we might be facing in the 2030s, and suggests ways how research might create options for Europe to cope and flourish.

Phase 1 – Meta-Scenarios

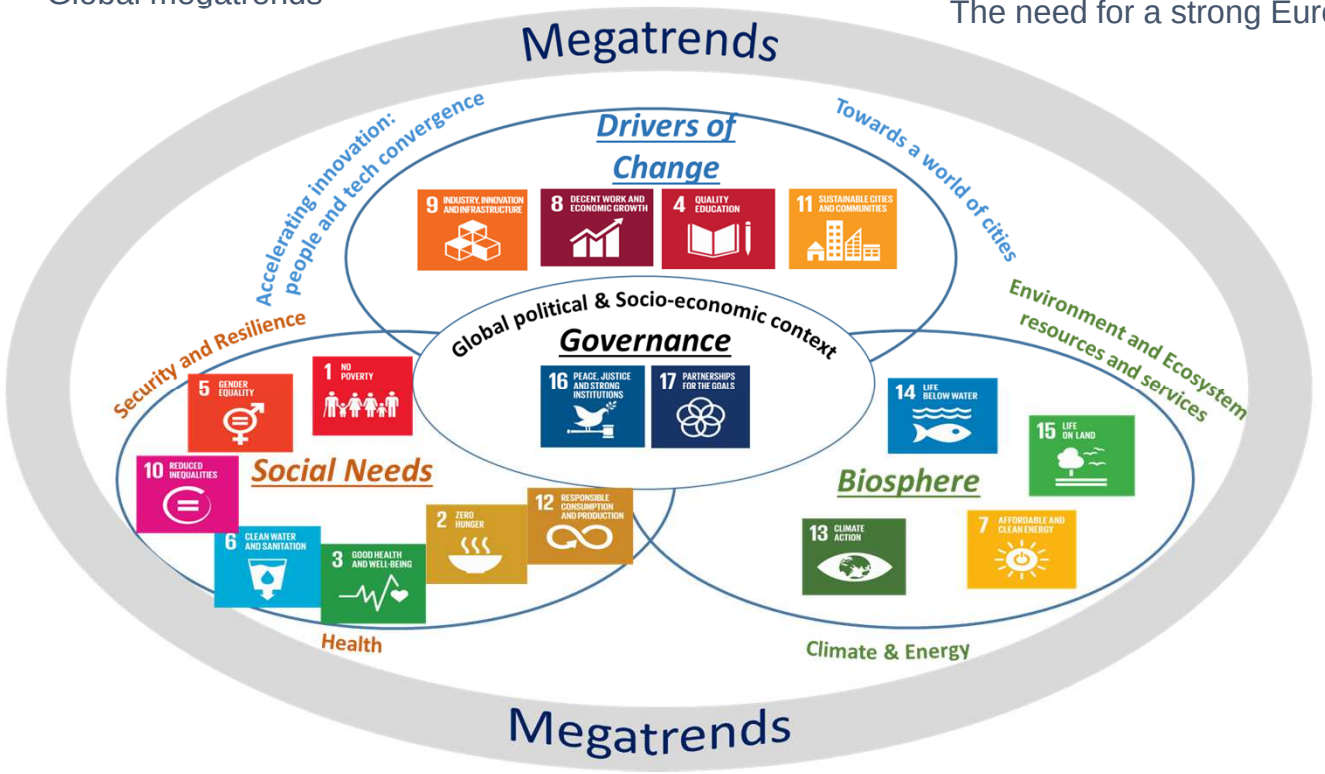
Analytical context

Global megatrends

Normative context

Sustainable Development Goals

The need for a strong Europe



"Europe is at a crossroads: either we keep and strengthen the role as one of the main global actors, or we become an increasingly irrelevant outgrowth on the Asian continent"

(Gonzales Report "Europe 2030")

Contrasting scenarios of global and European scope

Two types of scenarios to illustrate the possible transitions:

- 'Perseverance Scenarios': current structures and institutions persevere, leading to a continuation of current cleavages
- 'Transition scenarios': Europe spearheads the structural transition to 'the future we want'

7 Perseverance Scenarios

- Turbulent transitions
- Climate calamity
- The age of over-exploitation
- Health divide
- Security race
- Losing the race against the machine
- Urban jam

7 Transition Scenarios

- Transforming our world for the better
- Low carbon transition
- Towards a new well-being
- Towards health for all
- Building societal security
- The innovation revolution for everyone
- Urban bloom

Towards a world of cities

Urban jam

- Global urbanization unabated
  - Fast urbanization of low income groups => more slums
  - Sprawl => poor accessibility, car emissions dominate
  - Overstretched infrastructure + extreme weather events => congestion, urban decay
  - Global vicious circle: insecurity, disease & social unrest
  - Megacities's development polarizes investments => limited innovation for improved livelihood
  - Cities fail as the engine of growth & employment
- Traditional transport market unfit
  - Overestimated reliance on technological progress alone
  - Transition to automated vehicles: technology driven
  - No radical change in mobility paradigm & business models
  - Decarbonisation but no absolute decoupling
  - Innovation (ICT, Big Data) set by new entrants
  - EU transport industry suffers, leadership at risk
- What if…
  - Can clogged cities be vibrant, creative and innovative spaces?

New models of urban development

- Smart cities as interconnected systems
  - ICT, sensors, IoT => network interconnection, near-zero maintenance infrastructure
  - Collaborative economy, multi-stakeholders integrated strategy
  - Compact cities => productivity, accessibility, carbon efficiency
  - Hi speed, hi efficiency inter-city connections (hyper loops)
  - By 2050, European urban sprawl down by 30 000 km2
  - EU experience informs urban space planning worldwide
  - (Smart) cities as the transformative power towards SDGs
- New mobility paradigm, service-oriented market
  - Behavioural changes & social innovation drive technological progress
  - Connected & autonomous vehicles boosted by shared economy
  - Sustainability concerns => internalisation => decoupling (55% less emissions by 2030)
  - Virtualisation of freight movement + local economies
  - Transport decarbonised (95%) by 2050
  - New business models + intersectoral cooperation => EU competitiveness/leadership
  - 80% reduction of costs/p.km by 2050
- What if…
  - Urban farming reclaims > 20% of urban space

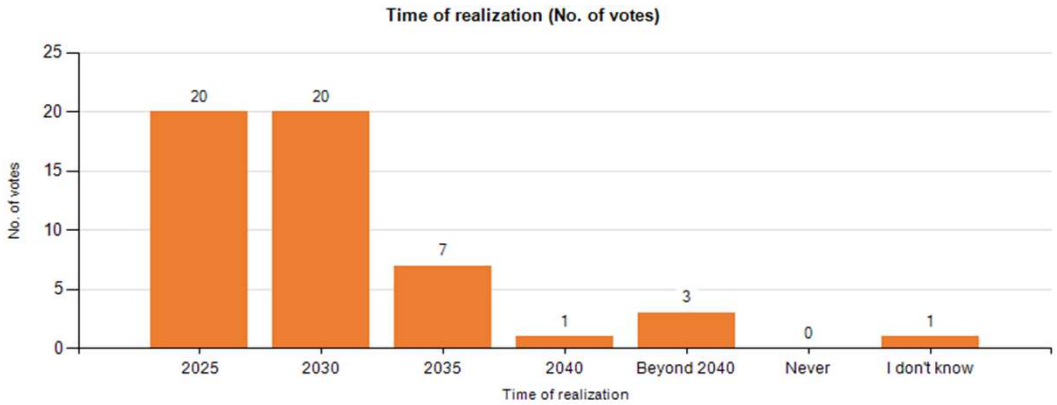
Phase 2 – Delphi: how does uncertainty reflect on R&I?

- Delphi is particular type of expert survey
  - Assessment of future development (e.g. time horizon, impact, significance, …)
  - Revision of assessments in view of group results
  - Argumentative Delphi: Assessments are underpinned by arguments and votes
- 147 Statements
  - Statements on developments in S&T
  - Statements on socio-economic developments driving R&I
- Assessment
  - Time horizon of realisation + arguments
  - Significance for R&I / for R&I policy + arguments
- Interpretation
  - „Likely“: Significant and likely realisation by 2040
  - „Uncertain“: Significant, but uncertain time frame of realisation
  - „Wildcards“: Unlikely realisation, but potentially high significance if realised

Phase 2 – Delphi: how does uncertainty reflect on R&I?

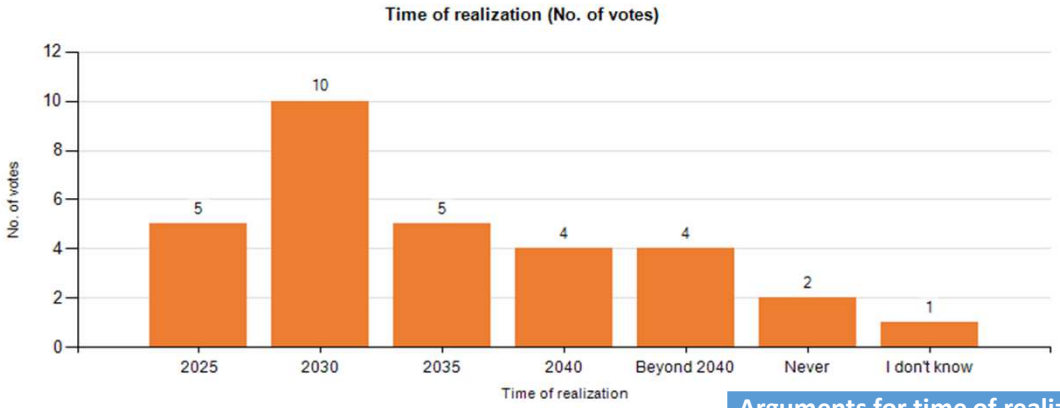
- **Time of Realization in 5 year steps**: What is the time of realization? (until 2020, 2021-2025, 2026-2030, 2031-2035, 2036-2040, 2041 and later, never, gradual development without specific timing, I do not know)
- Arguments for the Time of Realization
- **Significance** 
- **A) Significance of R&I:** Is R&I significant for the topic? Very significant to not significant – with **arguments**
- **B) or: Significance for EU R&I policy:** Is the topic significant for EU R&I policy? Very significant to not significant – with **arguments**
- **Arguments are ranked**
- **Focus: qualitative discussion**

The majority of the EU population use integrated Artificial Intelligence devices and machines in their daily lives



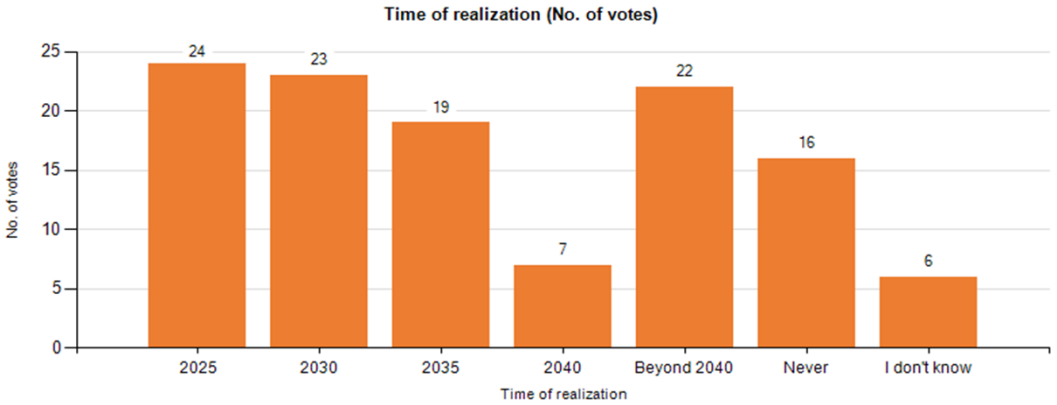
Arguments regarding the time of realization	No. of votes
AI technologies will be used to improve analysis and prediction in devices used daily, without being recognised as such by the users (e.g. navigation devices, smart home controllers, smart cars etc.).	48
Online services (e.g. Google Translate) already employ self-learning AI.	34
AI (or "synthetic intelligence") will be utilized by most of the pervasive large-scale services (finance, media, social networks, e-commerce), so that people interact with it, for the most part unknowingly, all the time.	31
Self-driving cars, trucks and busses will be prevalent by 2030 implying daily contact for almost the entire population. Fraud protection in financial systems based on blockchain will be pervasive.	14
In practice, there are no real AI machines in our daily lives. Service robots like vacuum cleaner robots are not intelligent.	7
AI has been in development for a long time and we still have problems with language recognition.	6
It will take time until real AI will be in our households, but if this happens, they might be treated like family members (see Aibo and other pets).	3
We do it already today. When my TomTom with HDtraffic sees a traffic jam, I follow its advice for a detour.	1
People will use AI Technology quite frequently if it comes to data related services, e.g. via Internet, but there will be no intelligent machines (robots) in their daily life.	1

The use of artificial intelligence and robots causes 30% of current jobs to disappear (jobs that existed in 2016)



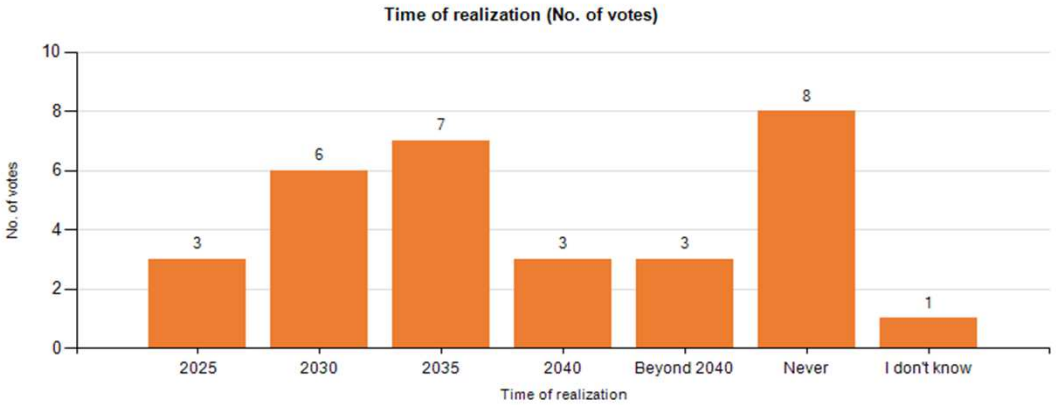
Arguments for time of realization	No. of votes
Other jobs might be created.	24
New jobs will be created. What we need is more creativity about what people's jobs will mean in the future.	18
Job titles change very fast already. 30% in 10 years is not unlikely.	11
Less people in the EU countries means less workpower - robots are a long-term solution.	8
The problem is not AI or robots, but the marketisation of healthcare, social care and other types of work.	6
This is the assumption of a well-known study by a consultancy.	5
What AI can/cannot do can be discussed at length. Usually the future reality is rather different from the images created now.	3
When AI (bots) and also physical robots take more and more tasks and responsibilities, they will not need public healthcare, education etc. All job markets will be privatized, well, automatically.	2

With the introduction of new technologies such as 3D printing, a significant proportion of manufacturing is decentralised and carried out either by consumers or local businesses. As a result, industrial floor-space in Europe shrinks by 50% (compared to 2016)



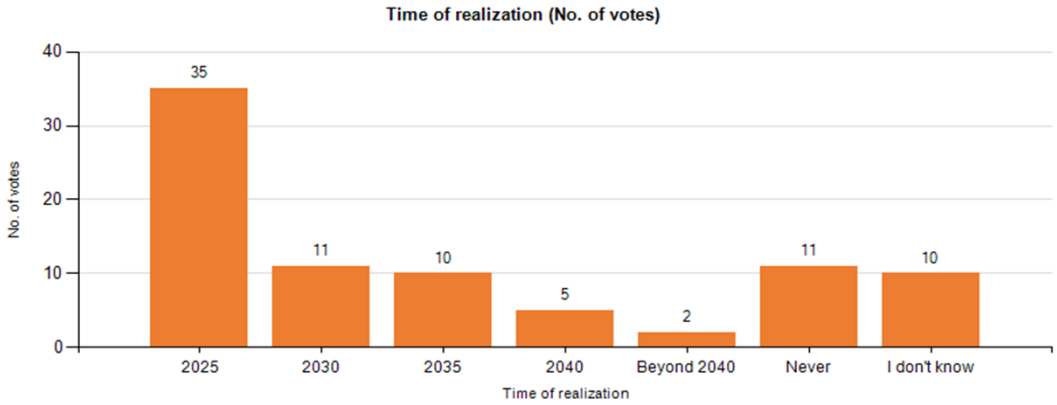
Arguments regarding the time of realization	No.
Current 3D printers have limited capabilities and can only print with a limited number of molecules. To improve the range of outputs will require a lot of time.	61
Producers have already begun printing spare parts and small parts - this is a challenge for suppliers in the very near future and will decrease their floor-space.	51
3D printing is used for component production only. Large parts of the floor space in Europe is used for assembly and process industries which will never be replaced by 3D printing.	36
It will be used for special applications, e.g., medical (tailor-made) or prototypes. However, it will be difficult for it to compete with large-scale production.	35
In every city, 3D printers can already be found - the Maker Movement supports the application of this technology. Therefore, these changes will be very rapid.	21
Industrialization of 3D printing requires a seamless integration of 3D printing within the shopfloor, shopfloor systems and post-processing.	19
New technology requires much longer time than 30 years to catch up with traditional technologies - in 2040, Tech Business will use 3D-printing but in narrow, specialized fields.	16
3D printing has advantages for a selected range of products with complex shapes. For mass production 3D is unsuitable and too costly.	11
3D printing will be used within the manufacturing steps rather than substitute existing production processes. This will allow achieving new features, mechanical and functional, on existing products.	11
3D printing will become the new industrial floor-space.	10
The main issue for additive processes: seamless integration with subtractive processes based on an interoperable numerical control program and metallic material, currently proposed by hybrid machines.	8
Large floor space for storage will shrink but the amount of decentralized floor space is likely to increase as business looks to optimize overall operations. May have greater impact on warehousing.	4
3D printing enables very rapid product change and adaptation to local conditions significantly reducing packaging and shipping costs.	3

In developed countries, the average working time (time spent at paid labour) is 40% shorter than in 2016 due to increased productivity (ratio of output to inputs used in the production process)



Arguments for time of realization	No. of vote
In fact at least **dual systems** develop with privileged workers working few hours and being paid well and a new proletariat being overworked and paid below decent pay.	17
There is a trend to mix working time and leisure time (e.g. citizen innovation). This results in **longer working times**.	16
Productivity gains will not be reflected in shorter working time, but rather in **increased consumption**.	12
Several studies show that in fact shorter time leads to productivity gains.	12
Key dimensions of "work" will change. Paid labour may be reduced but entrepreneurship will grow as many voluntary ways of working with indirect benefits.	11
Political change is necessary to increasingly value off-work activities (e.g., volunteer or community service, parenting, etc.)	9
The effective working hours may decrease but time at work may increase to include the need of supervising intelligent systems.	7
Productivity gains will not result in shorter working time as a smaller work force will have to provide for a greater number of inactive people due to demographic change.	7
This is desirable but value systems and inertia will collude to make this impossible.	6
Less available work will be thinly distributed across larger populations, resulting in shorter working times.	

Value and ethical conflicts relating to science and technology multiply to the extent that formal processes of ethical approval are established for every new EU research funded project



Arguments for time of realization	No. of votes
Formal processes of ethical approval are already in place for every single project. Public policy debates will concentrate on the extent of grey areas and the positioning of red lines.	56
Ethical approval processes will not be sufficient for addressing ethical conflicts relating to science and technology, which can be much broader than individual research projects.	39
Ethical approval might become important, however, what is ethical will become more and more contested with AI and synbiochem on the rise.	25
Formal ethical processes already exist at project level. The key issue for the future is whether they are monitored and whether there are consequences from their (insufficient) implementation.	17
Isn't this already the case today? No doubt this can be built upon incrementally with political will.	14
Examples of today's socially relevant problem areas of research ethics are the areas of animal experiments or human experiments with subjects, stem cell research, genetic engineering, research on armament purposes, resource consumption.	14
Never, otherwise research in areas with strong conflicts about values and ethics (AI or Synthetic Biology) will take place outside Europe.	7
There will always be research areas which do not raise ethical issues, and freedom of research just means that the default position is no formal approval required.	4

Phase 3 – Targeted scenarios

(seeking a tradeoff between coverage and overlaps)

Drivers of change

- Future of Knowledge Production
- Nano-to-Macro Integral Manufacturing
- The electro-sphere of sensors
- Ambient Emotional intelligence
- Continuous Cyberwar
- Advanced ICT-based security

The Biosphere

- Low-Carbon economy
- Next-generation bio-economy
- Cheap Renewable Energy Sources
- A self-reliant circular economy
- Making an economic case for nature

Social needs

- Re-construction of the Meaning of Work
- Towards diversified Food Supply: Natural and Novel Food
- Assisted living / Autonomous living
- Human organ replacement
- Precision medicine
- Defeating communicable diseases
- Mobility as a Smart, Sustainable and Intermodal Service

Governance

- Decision-making supported by open expert systems

technteche.com

RRI as a guiding principle

Responsible Research and Innovation: "an inclusive approach to Research and Innovation (R&I), to ensure that societal actors work together during the whole research and innovation process. It aims to better align both the process and outcomes of R&I, with the values, needs, and expectations of European society. In doing so, it fosters the creativity and innovativeness of European societies to tackle the grand societal challenges that lie before them, while at the same time pro-actively addressing potential side-effects"

Adapted from EC, RRI declaration

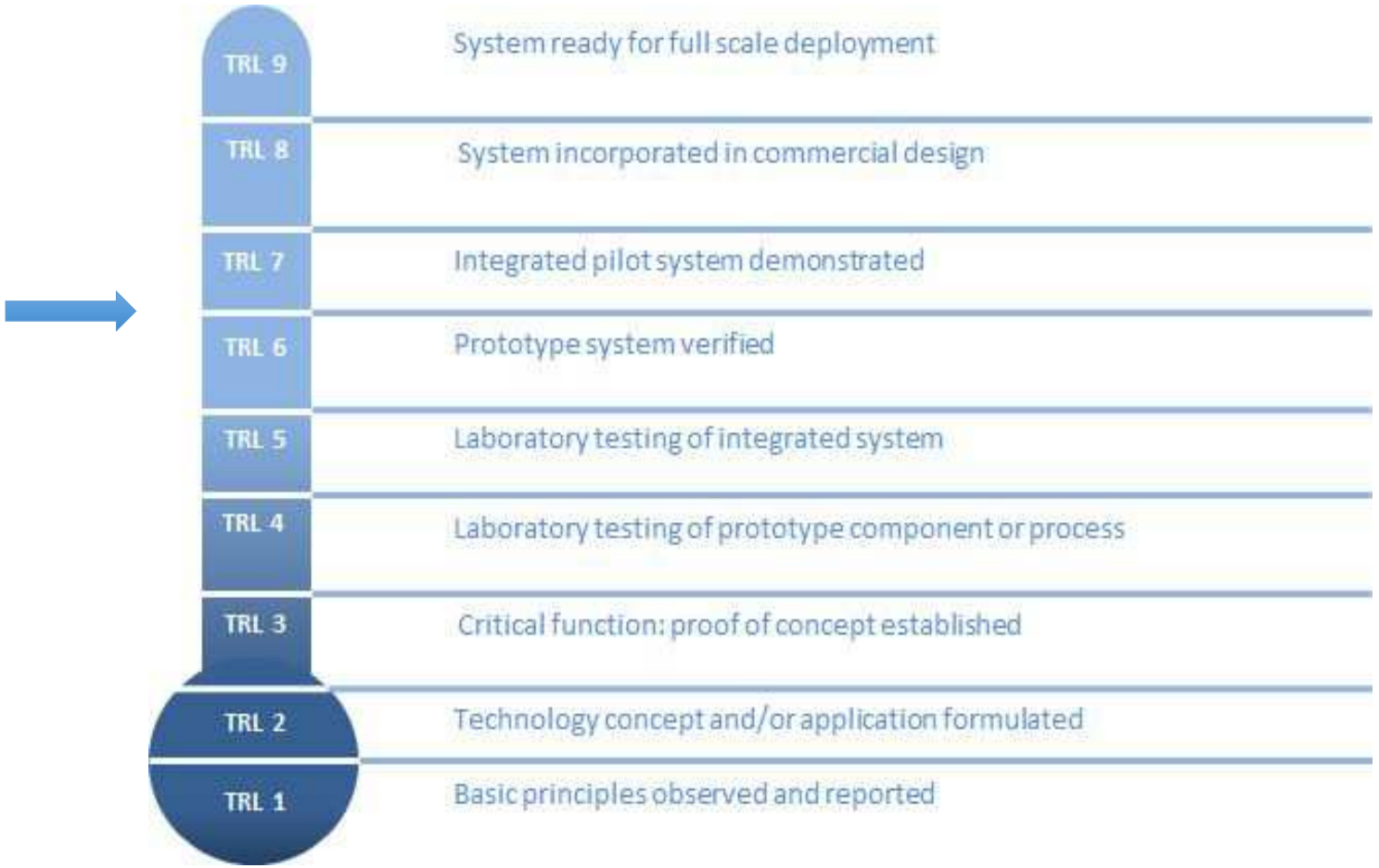
RRI: approach and tools

- Public engagement
- Gender equality
- Science education
- Ethics
- Open access
- Governance

beinghumanfestival.org

users.uoi.gr

Timing is of the essence



Source: Innovation Seeds

MOBILITY ENERGY ENVIRONMENT

The future moves us.

Thank you

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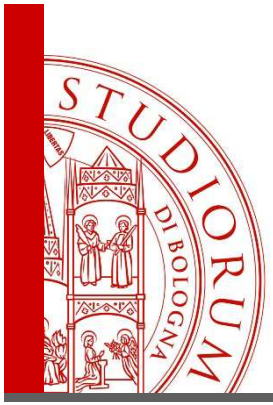
Innovation for sustainability ISINNOVA



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Social Sciences and Humanities for a changing Europe

SSH projects and networks at the University of Bologna

16-17 November 2017,
University of Bologna

Project facts and figures

- Lorenzo Chiari (Project Coordinator)
- FAll Repository for the design of Smart and sElf-adaptive Environments prolonging INdependent livinG – FARSEEING

- Funding Programme: FP7-ICT-2011-7
- Project funding: 3,489,000 € (total), 718,878 € (UNIBO)
- Duration: 39 months - 1/1/2012 – 31/3/2015

PROJECT CONSORTIUM

FARSEEING

- ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE
- THE UNIVERSITY OF MANCHESTER
- AZIENDA SANITARIA DI FIRENZE
- DEUTSCHE SPORTHOCHSCHULE KOLN
- ACADEMISCH ZIEKENHUIS GRONINGEN
- STIFTELSEN SINTEF
- NOEMALIFE SPA
- BTICINO SPA
- NORGES TEKNISK-NATURVITENSKAPELIGE UNIVERSITET NTNU
- SENSARIS SARL
- ROBERT BOSCH GESELLSCHAFT FUR MEDIZINISCHE FORSCHUNG MBH
- **ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA - COORDINATOR**

Project objectives

- Foster **health promotion** by better prediction/ prevention/detection of adverse events (eg falls) and support of older persons ⇒ Public Health
- Exploit synergies with ongoing epidemiological studies (eg InChianti) ⇒ Surveillance
- Build the world's largest fall repository ⇒ Big Data
- Counteract institutionalisation and loss of independence (eg by home modifications) ⇒ Smart Living
- Translate technological advance into **real world service provision** and novel exercise regimens

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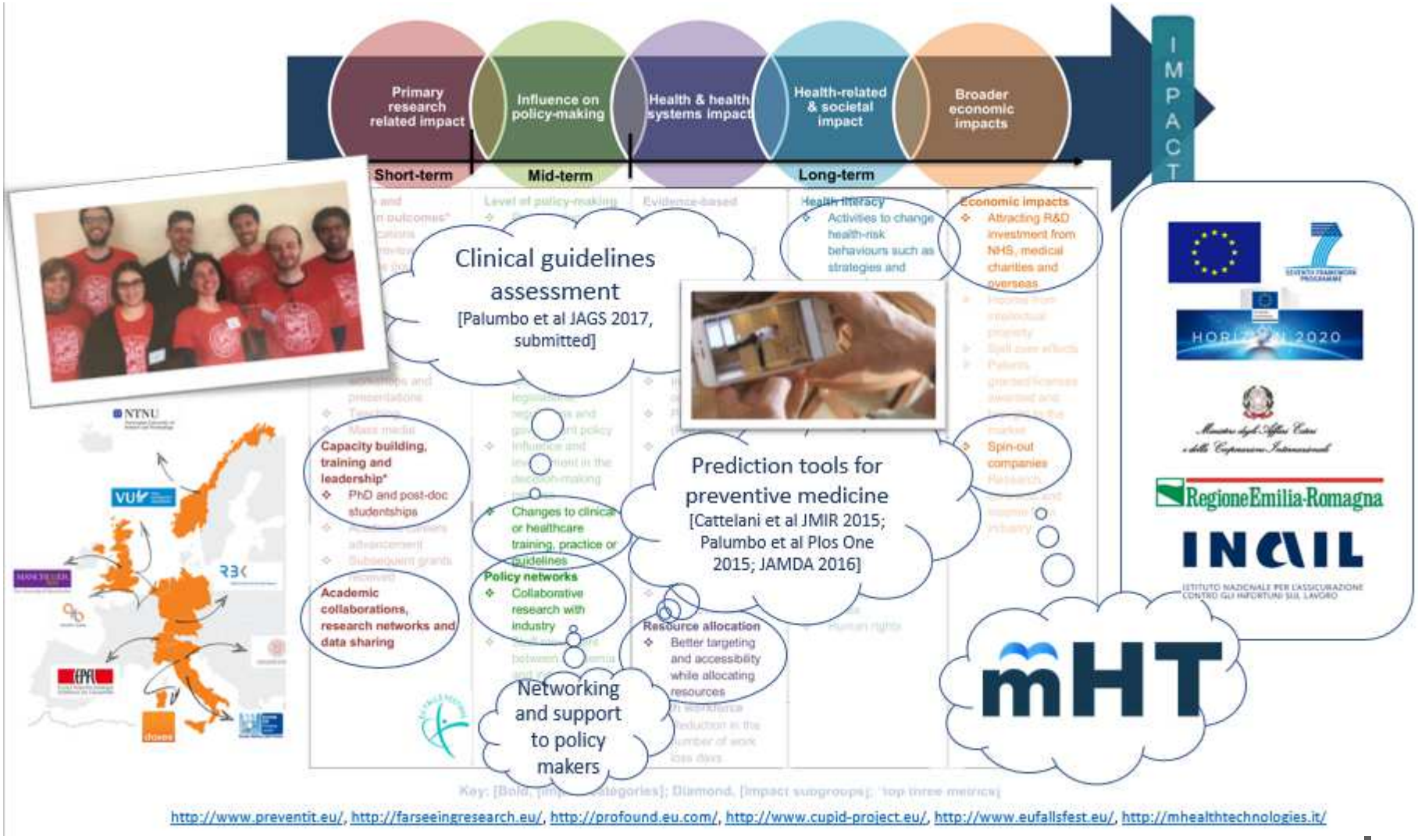
- Translate technological advance into **real world service provision** and novel exercise regimens ✓✓

Projects results and/or highlights

- Several exploitable results: tools/toolkits, knowledge frameworks and products (eg digital fall risk assessment/fall detection, taxonomy of technologies, guidelines for service design, standardization frameworks, etc)
- Community-based Consensus and Evidence-based knowledge on falls, their prediction/prevention/ recording, and conceptual modelling
- Real-life & real-data impact assessment (usability, inclusive design, co-design, validation, health economics modelling)

Projects results and/or highlights



http://www.preventit.eu/, http://farseeingresearch.eu/, http://profound.eu.com/, http://www.cupid-project.eu/, http://www.eufallsfest.eu/, http://mhealthtechnologies.it/

Projects results and/or highlights

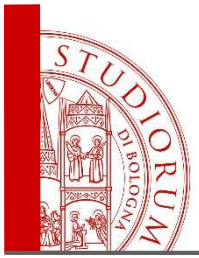
Freelepida

@EUFallsFestival
#EUFF2016

EU Falls Festival 2016
Bologna, 23-24 February 2016
Terza Torre, Regione Emilia Romagna

New calls in Horizon 2020

- Interests towards the new calls 2018-2020 of Horizon 2020:
  - SC1-DTH-03-2018 - Adaptive smart working and living environments supporting active and healthy ageing
  - SC1-DTH-07-2018: Exploiting the full potential of in-silico medicine research for personalised diagnostics and therapies in cloud-based environments
  - SC1-BHC-05-2018 - International flagship collaboration with Canada for human data storage, integration and sharing to enable personalised medicine approaches
  - SC1-BHC-23-2018: Novel patient-centred approaches for survivorship, palliation and/or end-of-life care



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WE
CAN DO
SO MUCH
TOGETHER

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

TECNALIA
Inspiring Business

17/11/2017

Dr. Raúl Tabarés

Social Sciences and Humanities for a changing Europe

Bologna

tecnalia Inspiring Business

DSS2016.EU

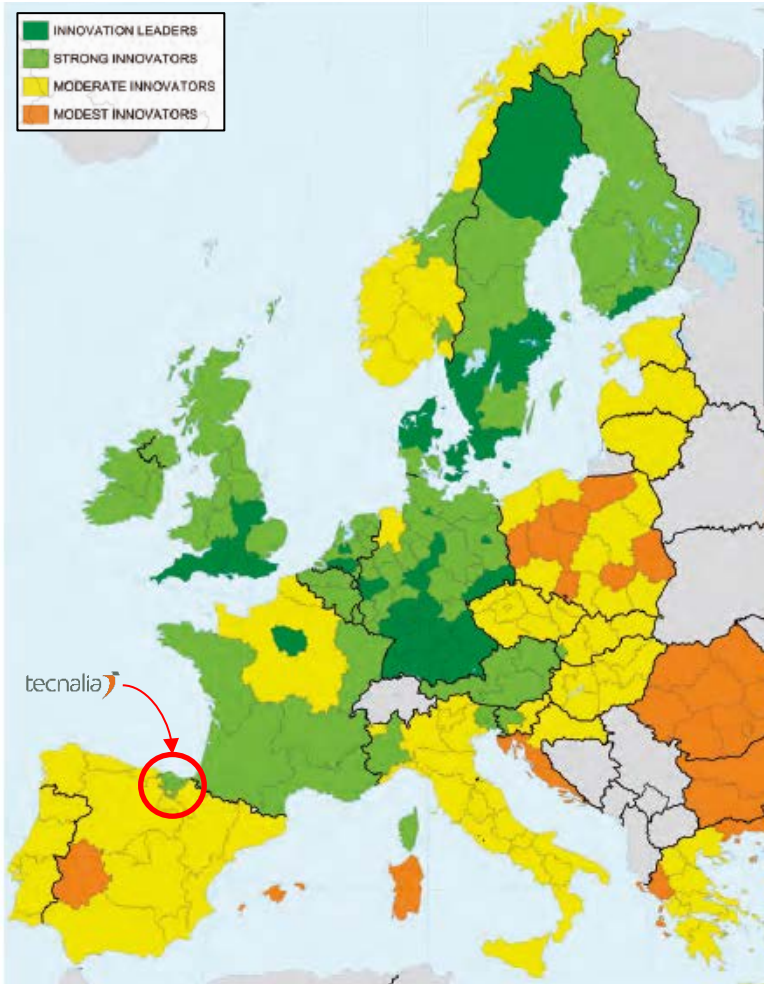
DSSINNOVA 2016

A European
Benchmark

tecnalia Inspiring Business

1st national private organisation in project contracting, participation and leadership within the EU Horizon 2020 Programme.

- **+1400 people and +100 M€ incomes in 2016**
- **6 business divisions (Construction, Industry & Transport, Energy, Health, ICT, Technological Services)**
- **1st national private organisation in project contracting, participation and leadership within H2020 programme**
- **Member of the boards of the main EU PPPs, European Technology Platforms, EARTO, JIIP**
- **Strong commitment with innovation:**
  - ❑ **21 NTBCs, +4000 client companies, 378 active patents**
  - ❑ **Tecnalia Ventures for investment opportunities**
- **Basque Country is the only Spanish high innovation region (in all the EC Regional Innovation Scoreboard reports from 2009)**



EC Regional Innovation Scoreboard 2016

A European
Benchmark

SEVENTH FRAMEWORK PROGRAMME

PARTICIPATION IN THE EU 7th FRAMEWORK PROGRAMME (2007-2013)

Position	Organisation	Type	Country
1	CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	REC	FR
2	FRAUNHOFER-GESELLSCHAFT	REC	DE
3	CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE	REC	FR
4	THE UNIVERSITY OF CAMBRIDGE	HES	UK
5	THE UNIVERSITY OF OXFORD	HES	UK
6	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS	REC	ES
7	CONSIGLIO NAZIONALE DELLE RICERCHE	REC	IT
8	MAX PLANCK GESELLSCHAFT	REC	DE
9	IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE	HES	UK
10	UNIVERSITY COLLEGE LONDON	HES	UK
11	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH	HES	CH
12	KATHOLIEKE UNIVERSITEIT LEUVEN	HES	BE
13	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE	HES	CH
14	VTT	REC	FI
15	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	REC	DE
16	TNO	REC	NL
17	INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE	REC	FR
18	DANMARKS TEKNISKE UNIVERSITET	HES	DK
19	TECHNISCHE UNIVERSITEIT DELFT	HES	NL
20	THE UNIVERSITY OF EDINBURGH	HES	UK
21	KOBENHAVNS UNIVERSITET	HES	DK
22	THE UNIVERSITY OF MANCHESTER	HES	UK
23	**FUNDACIÓN TECNALIA RESEARCH & INNOVATION**	**REC**	**ES**
24	JRC - JOINT RESEARCH CENTRE- EUROPEAN COMMISSION	REC	EU
25	KARLSRUHER INSTITUT FUER TECHNOLOGIE	HES	DE

SOURCE: SEVENTH FP7 MONITORING REPORT 2013 (EUROPEAN COMMISSION)

*** REC: RESEARCH ORGANISATION**
*** HES: HIGHER OR SECONDARY EDUCATION ORGANISATION**

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TECNALIA ranks **23rd out of 32,000** European **organisations** involved.

SOME FIGURES

377 PROJECTS APPROVED

85 PROJECTS LED (21.5%)

131 CONTRACTS (€M)
4% OF CONTRACTS WON IN SPAIN

IN CO-OPERATION WITH

2,890 EUROPEAN ORGANISATIONS

570 SPANISH ORGANISATIONS

406 SPANISH COMPANIES

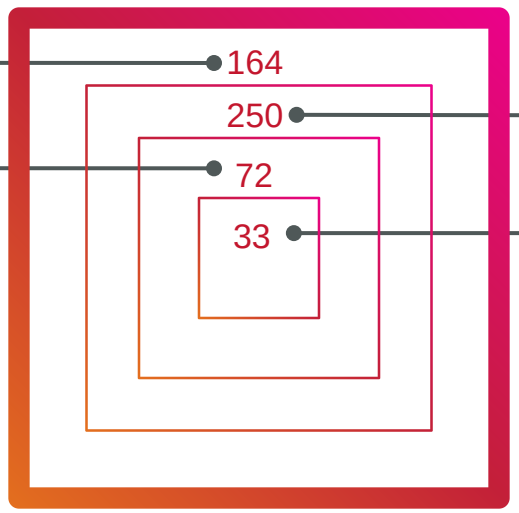
109 BASQUE COMPANIES

A European
Benchmark

PARTICIPATION IN HORIZON 2020

164
PROJECTS CONTRACTED

72
CONTRACTS (€M)



250
COLLABORATING COMPANIES

33
PROJECS LED

Figures on 28 February 2017

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OpenMaker

-Making Good our Future Exploring the New boundaries of Open & Social Innovation in Manufacturing-

“To create a transformational and collaborative ecosystem that fosters collective innovations within the European manufacturing sector and drives it towards more sustainable business models, production processes, products, and governance systems”

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 687941

OpenMaker

THE YOUNG FOUNDATION

BOĞAZİÇİ ÜNİVERSİTESİ 1863

centire

IMT INSTITUTE FOR ADVANCED STUDIES LUCCA

LAMA

tecnalia Inspiring Business

top ix torino piemonte internet exchange

Universität Zürich[UZH]

accord group

PLUSVALUE

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OpenMaker

- H2020-ICT-10-2015
- 3.289.406,25€
- 10 Partners
- 4 Incubators (LES)
- 1 Platform (DSP)
- 20 Prizes of 20.000€
- 20 Prototypes
- 240 Interviews
- 1 White Paper
- (2016-2018)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 687941

HOW DOES IT WORK

Boost relationships in the LES through an enabling programme

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SCALING UP OF PROGRAMME & METHODOLOGY

START

Mapping of target groups: makers, innovators, traditional manufacturing entrepreneurs

Establishing Local Enabling Spaces to encourage stakeholders to work locally – there will be LES sites in 4 different countries

Developing a Digital Social Platform where knowledge values and efforts are shared

Institutional and political interest

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OUR PILOT SUPPORT SCHEME

4 ACCELERATOR HUBS

UK.OPENMAKER.EU

OpenMaker United Kingdom

ES.OPENMAKER.EU

Openmaker Spain

IT.OPENMAKER.EU

Openmaker Italy

SK.OPENMAKER.EU

OpenMaker Slovakia

20 PRIZES

9 MONTHS SUPPORT

5 PROJECTS FOR EACH ACCELERATOR

prototype innovations including products, production processes, supply or value chains, distribution or ownership

http://explorer.openmaker.eu

1 PLATFORM

- support communication
- enable partnerships between Makers, Manufacturers, researchers and policy makers.
- access tailored resources and key community influencers, sourced through algorithms for big data

OpenMaker: Open manufacturing ecosystem in Europe

The OpenMaker programme is offered through 4 accelerator hubs (and 5 accelerators in total) in locations around Europe. You can find out more about what makes each hub special below.

ITALY | SLOVAKIA | SPAIN | UK

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 687941


OpenMaker


intel
Google
Makers
town


Altiero Spinelli


Tumaker

Interests

Horizon 2020 Reflective Societies Calls:

- **TRANSFORMATIONS-01-2018: Research for inclusive growth: addressing the socioeconomic effects of technological transformations**
- **DT-TRANSFORMATIONS-02-2018-2019-2020: Transformative impact of disruptive technologies in public services**
- **TRANSFORMATIONS-03-2018-2019: Innovative solutions for inclusive and sustainable urban environments**
- **TRANSFORMATIONS-05-2018: Cities as a platform for citizen-driven innovation**
- **DT-TRANSFORMATIONS-07-2019: The impact of technological transformations on children and youth**
- **TRANSFORMATIONS-13-2019: Using big data approaches in research and innovation policy making**
- **DT-GOVERNANCE-05-2018-2019-2020: New forms of delivering public goods and inclusive public services**

Interests

Horizon 2020 Science with and for Society Calls:

- **SWAFS-05-2018-2019: Grounding RRI practices in research and innovation funding and performing organizations**
- **SWAFS-14-2018-2019: Supporting the development of territorial Responsible Research and Innovation**
- **SWAFS-16-2019: Ethics of Innovation: the challenge of new interaction modes**

Horizon 2020 ICT Calls:

- **ICT-24-2018-2019: Next Generation Internet - An Open Internet Initiative**
- **ICT-28-2018: Future Hyper-connected Sociality**
- **ICT-30-2019-2020: An empowering, inclusive Next Generation Internet**

Thanks a lot and keep in touch!

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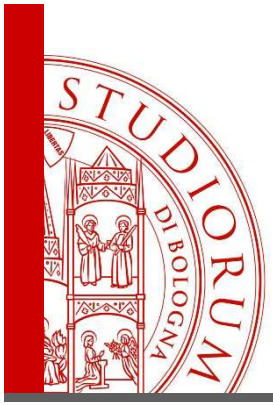


ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Social Sciences and Humanities for a changing Europe

SSH projects and networks at the University of Bologna

Paolo Torroni - DISI

16-17 November 2017,
University of Bologna

Project facts and figures

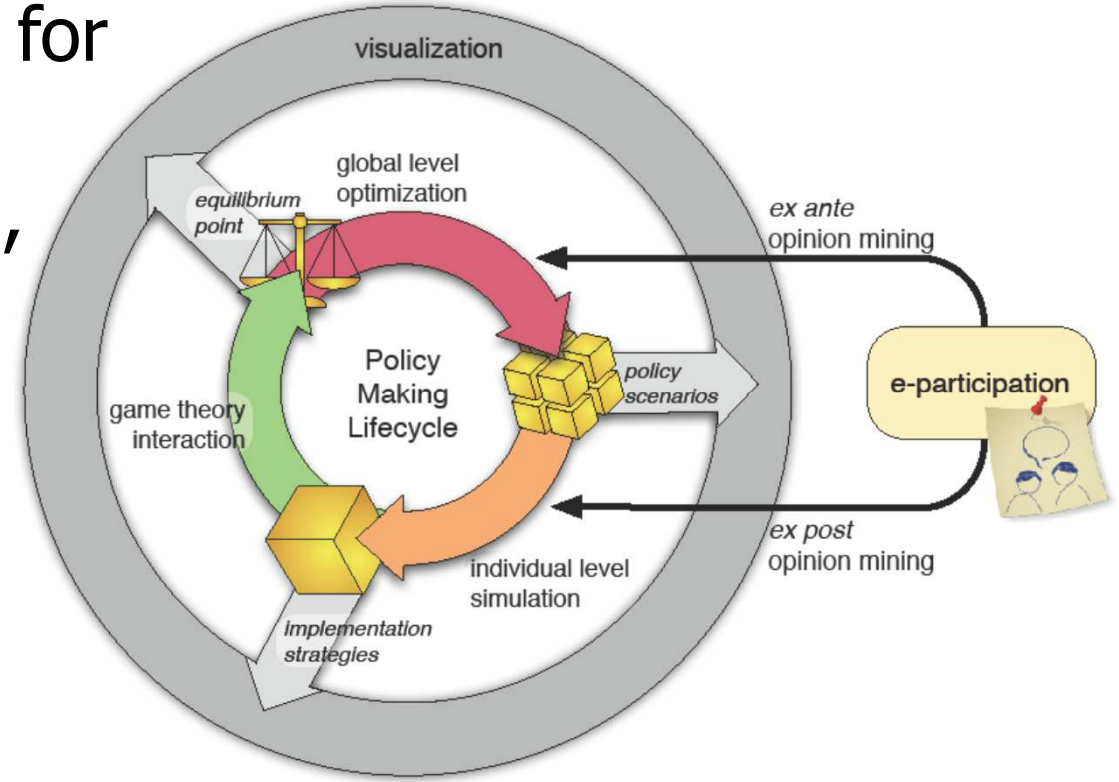
- **Michela Milano**, coordinator
- Engineering the POlicy-making LIfe CYcle (e-Policy)
- www.epolicy-project.eu
- Funding Programme: FP7
- Funding: 2,5 Ml (500K UNIBO)
- Duration: 36mths (2011-2014)

PROJECT CONSORTIUM

- Fraunhofer (DE)
- Uni College Cork (IE)
- Uni Ferrara
- ASTER
- Regione Emilia-Romagna
- INESC TEC (PT)
- Uni Surrey (UK)
- Power Planning A Ltd (UK)

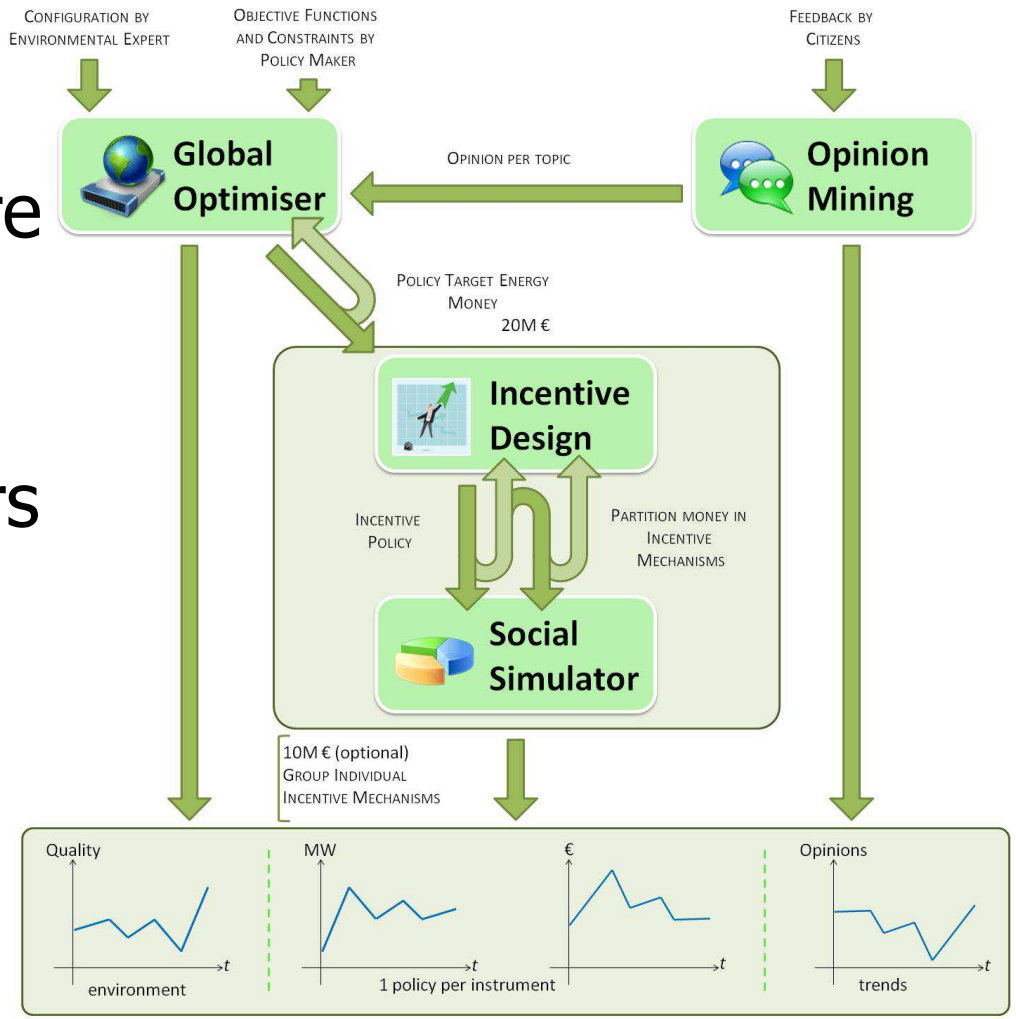
Project objectives

- To design and implement an ICT platform for aiding policy makers in their decision process
- To integrate tools for ex-ante decision process (planning, environmental assessment, implementation)
- To enable citizen participation



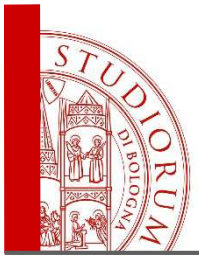
Projects results and highlights

- Components
- Extendibility of software to other domains
  - methodology
- Improved policy makers context awareness
  - objectives
  - alternative scenarios
  - socio-economical, and environmental constraints



New calls in Horizon 2020

- TRANSFORMATIONS-13: **using big data approaches in research and innovation policy making**
  - iPolicy4All (CO-CREATION06); U. Koblenz, Surrey, Wavestone, Engineering, ICCS, CIRCE, TML + pilots
  - Environmental policies (ePolicy + big data)
    - From opinion mining to argumentation mining
- LC-SC3-EE-14: **socio-economic res. conceptualising and modelling energy efficiency and energy demand**
  - MILESTONE (EE-8); Surrey, ECEEE, SEA-SIDE, CIRCE
  - Predictive/prescriptive energy policy
    - Self-reported vs observed vs target behaviour
- DT-MIGRATION-06: **migrant integration through ICT solutions**
  - Looking for Italian pilots (policy-makers)

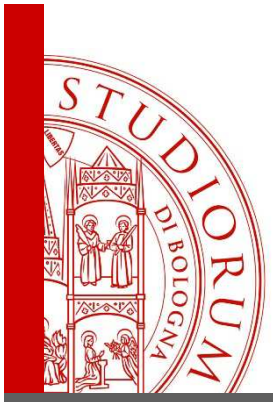


ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Michela Milano (coordinator)
michela.milano@unibo.it

Paolo Torroni (speaker)
paolo.torroni@unibo.it

www.disi.unibo.it



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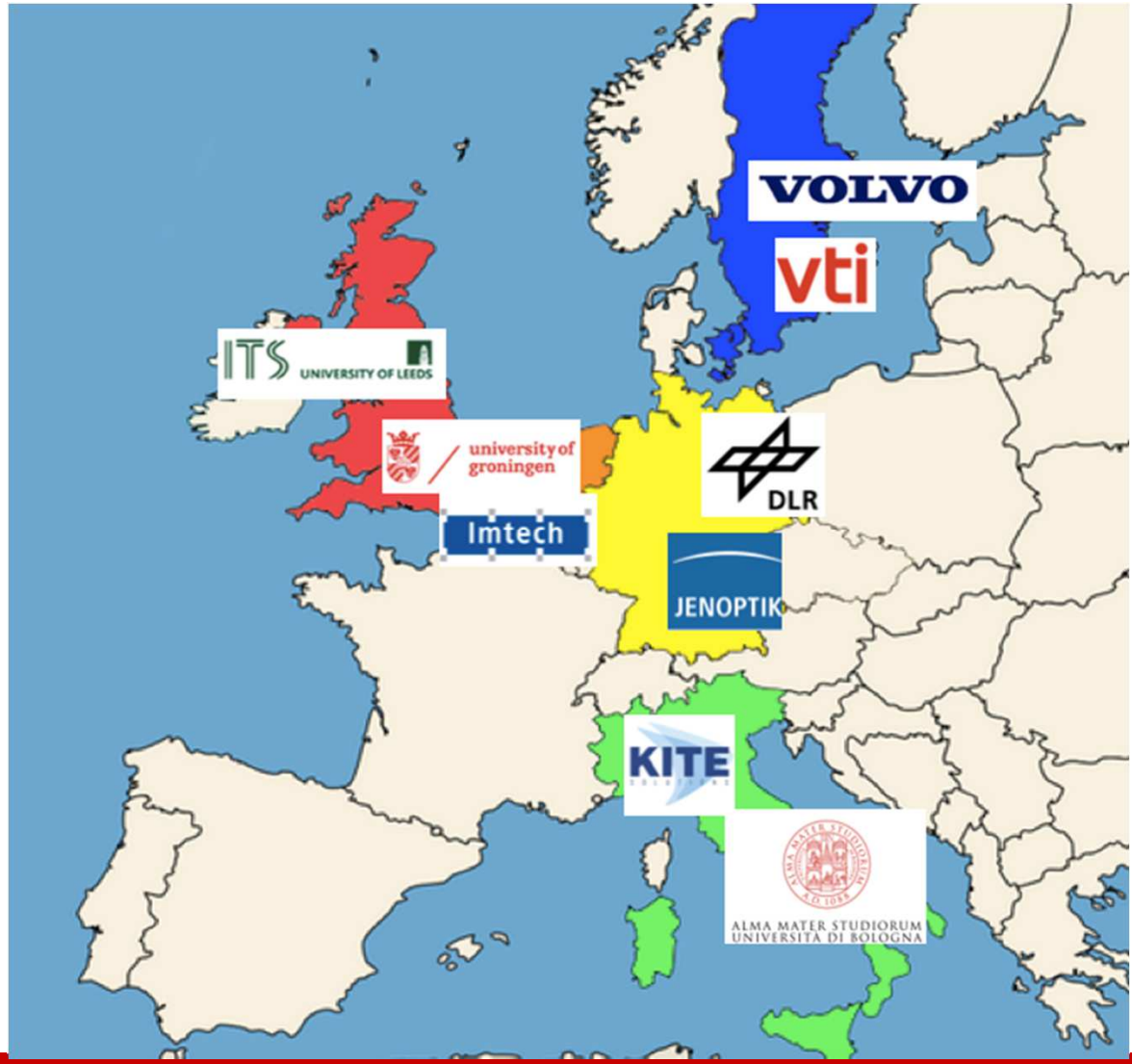
16-17 November 2017,
University of Bologna

Project facts and figures

- Prof. Luca Pietrantoni, Department of Psychologym, Project Coordinator

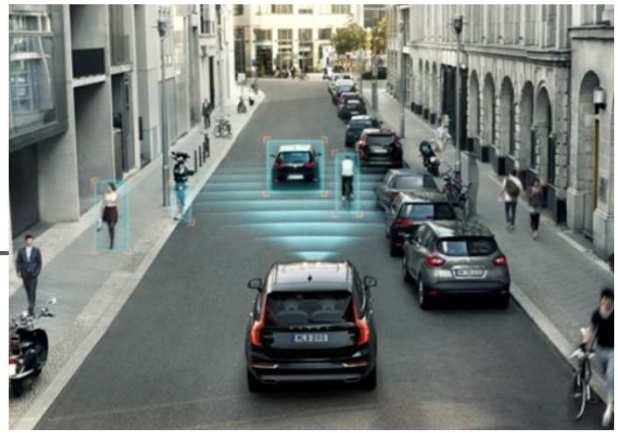
- **XCYCLE: Advanced measures to reduce cyclists' fatalities and increase comfort in the interaction with motorised vehicles**
- Funded by Horizon 2020 SC Transport
- Project funding: 5.000.000 euros
- UNIBO funding: 850.000 euros
- Duration: 42 months (end Nov 2018)

Project consortium



Project objectives

- To reduce road fatalities in vulnerable road users
- To improve cyclists' safety in the potentially dangerous interaction with motorized vehicles
- To investigate errors and violations of roar users
- To design and evaluate effective HMI and Intelligent Transport System for VRUs



Projects results and/or highlights

- Trans-disciplinary approach
- HF experts, traffic engineers, policy makers, ICT developers, communication scientists
- SSH component:
  - ✓ (Social) acceptance of technology
  - ✓ User centred approach
  - ✓ Gender/age analysis
  - ✓ Human-Machine Interface
  - ✓ HF issues (trust, comfort, UX)
  - ✓ Behavior change and social uptake of innovations

10 publications in interdisciplinary journals

Luca Pietrantoni
luca.pietrantoni@unibo.it

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INDUSTRY 4.0 IN EMILIA-ROMAGNA REGION

SOCIAL SCIENCES AND HUMANITIES FOR A CHANGING EUROPE

Bologna, 17/11/2017

Daniele Sangiorgi - ASTER

Objectives

To map the Industry 4.0 regional assets

Identify regional perimeter of the Industry 4.0 enabling technologies and related competencies

Develop a vision on Industry 4.0 for the strategic sectors of the Region

ASTER
innovazione attiva

The working group

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ASTER
innovazione attiva

CINECA

CNA
Emilia Romagna

CONFINDUSTRIA
Emilia-Romagna

ENEA
Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

INFN
Istituto Nazionale di Fisica Nucleare

UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

UNIVERSITÀ
DEGLI STUDI
DI FERRARA
- EX LABORE FRUCTUS -

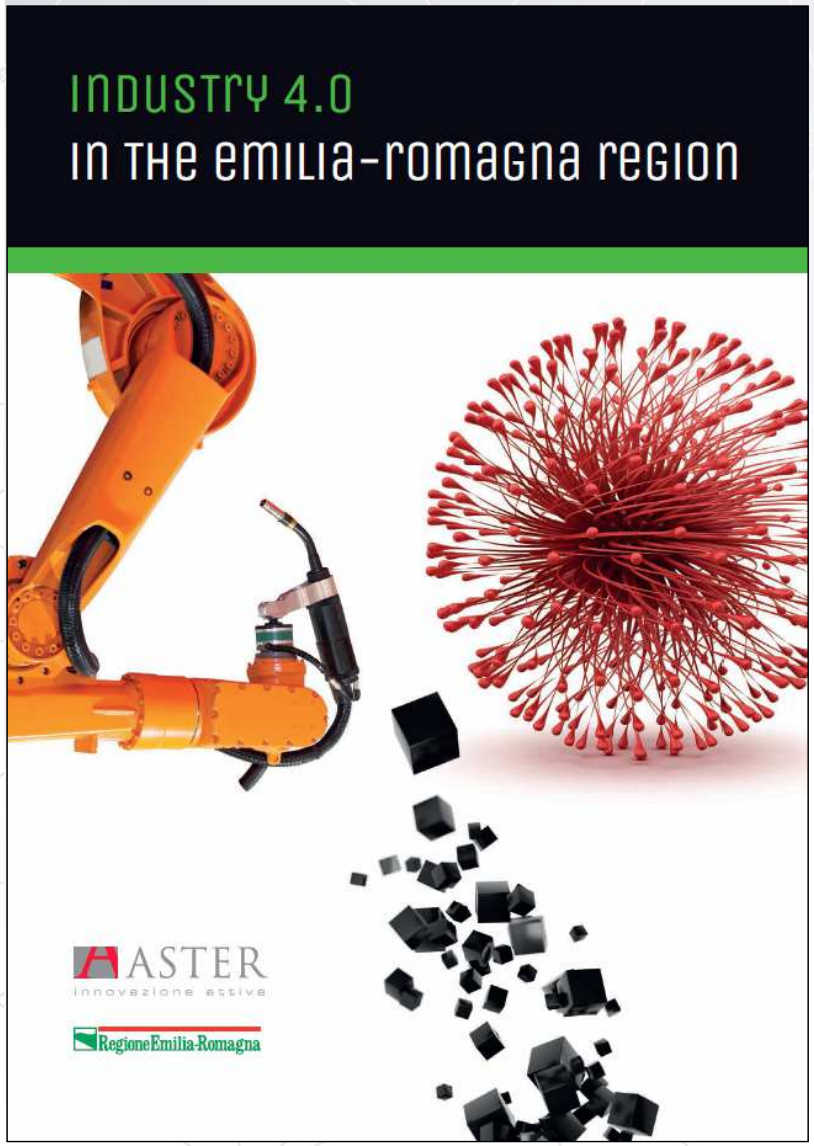
UNIVERSITÀ DI PARMA

UNIVERSITÀ
CATTOLICA
del Sacro Cuore

POLITECNICO
MILANO 1863

National Research Council of Italy

An analysis of Industry 4.0 assets in the Emilia-Romagna Region



- Education and training
- Competencies supporting innovation
- Infrastructures
- Project development skills
- Market oriented activities (patents and spin-offs)
- Synergies and vision for Emilia-Romagna S3

https://www.aster.it/en/pubblicazioni

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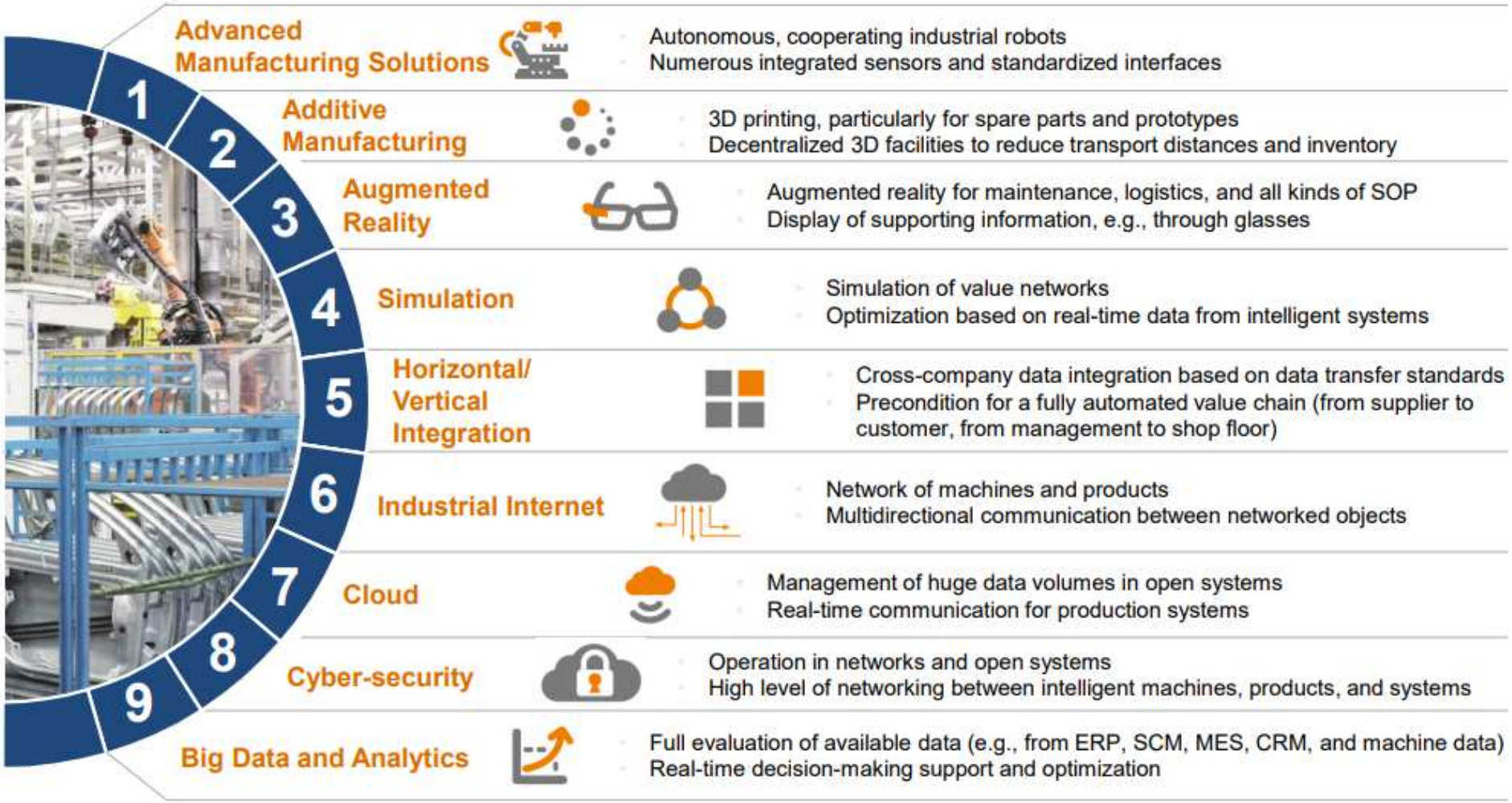
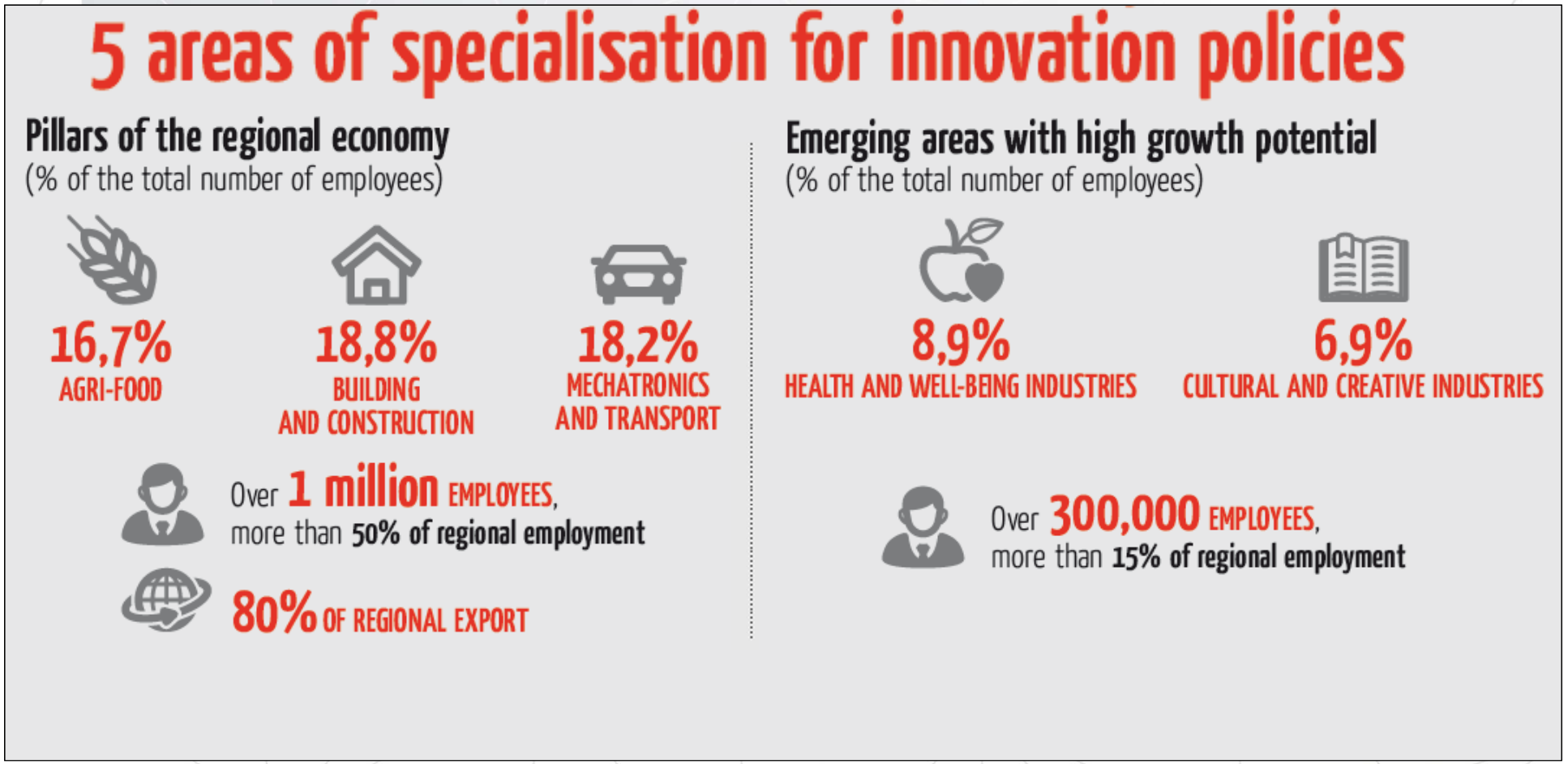
Industry 4.0 enabling technologies



Source: Italy's Plan "Industry 4.0", Ministry of economic development, January 2017

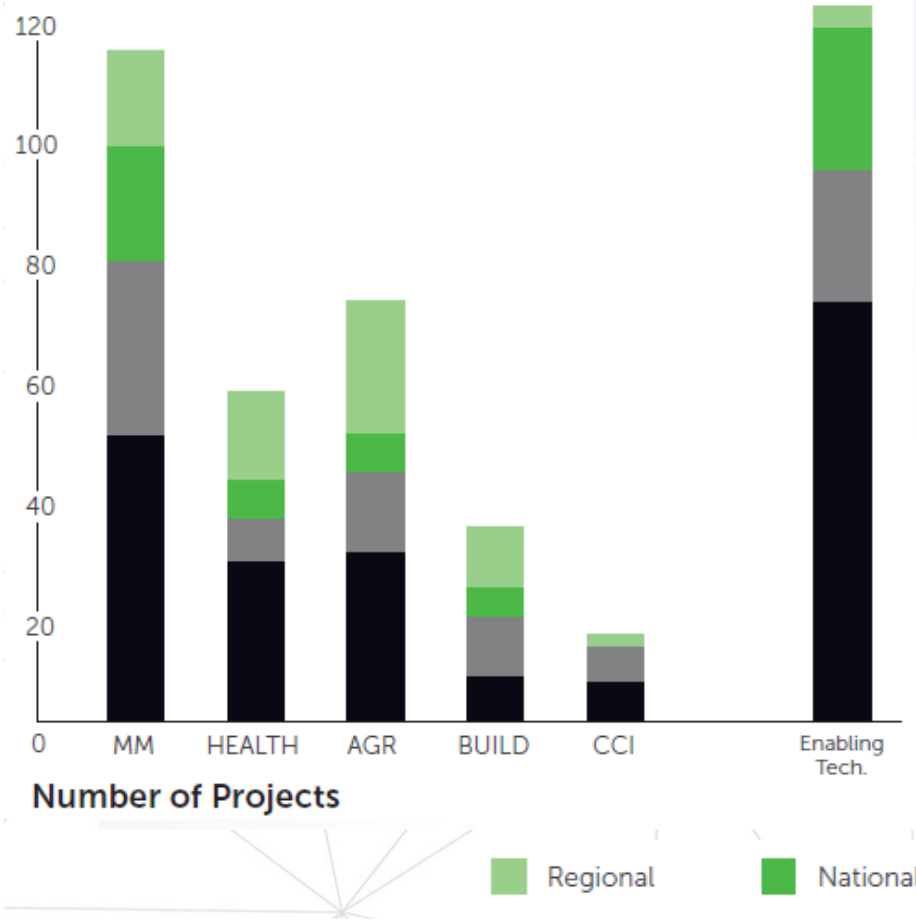
The Emilia-Romagna Smart Specialization Strategy (S3)

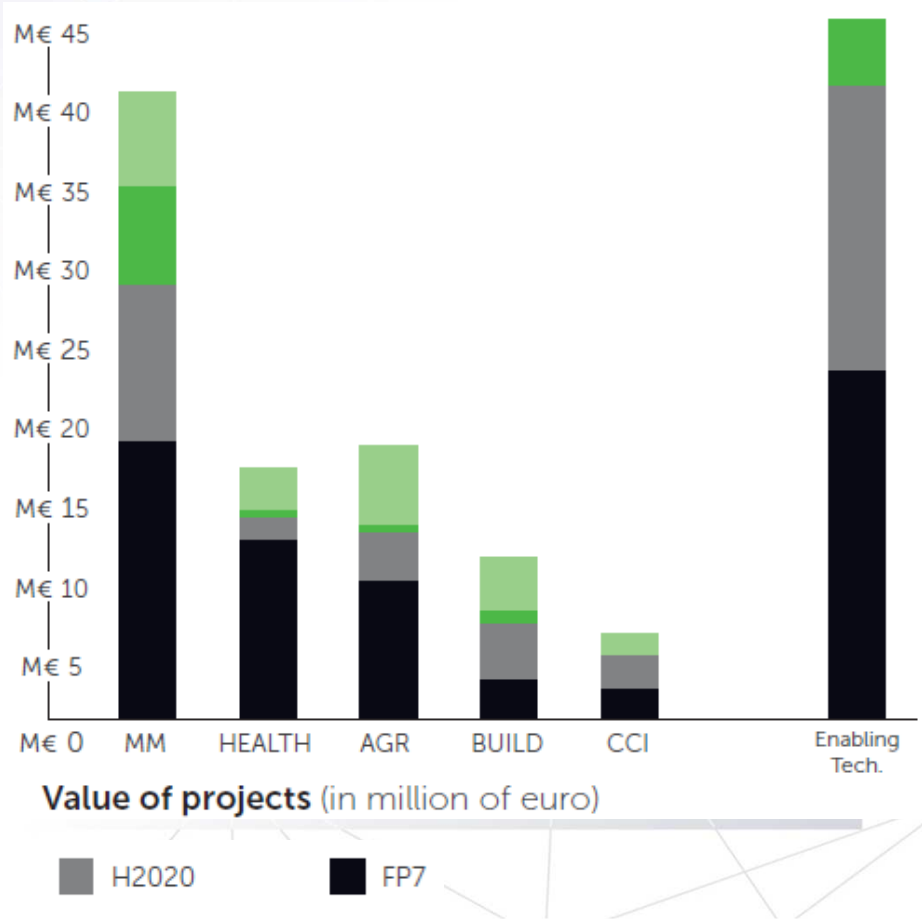


Industry 4.0 research projects in the Emilia-Romagna Region in 2007-2016

363 research projects

140 M€ overall value





Industry 4.0 regional infrastructures

54

Industrial research laboratories of the High Technology Network

63

Laboratories of university departments/research centres

2

Local premises of national consortia

CINI – National Inter-University Consortium for computer science
CNIT - National Inter-University Consortium for Telecommunications

1

Digital Innovation HUB

SMILE European Digital Innovation Hub for Industry 4.0 (I4MS)

1

Data Center Tier 1

At INFN CNAF

3

HPC

At CINECA, of which 1 Tier0 (Marconi), 1 Tier1 (Galileo) and an integrated system for Big Data processing (PICO)

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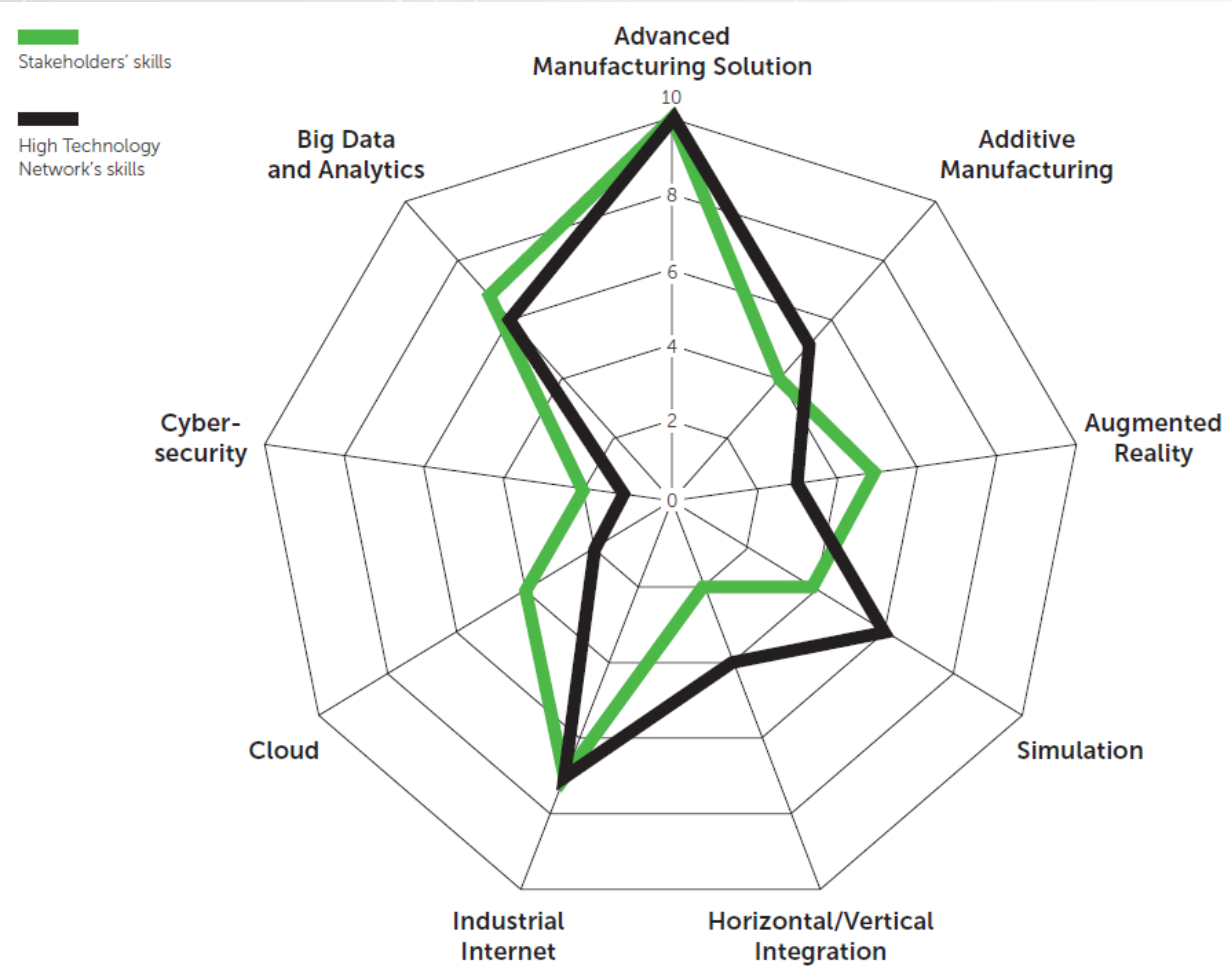
Industry 4.0 research competencies



Qualitative comparison between the skills expressed by the High Technology Network industrial research laboratories and the skills expressed on enabling technologies by the parties involved in the analysis

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Industry 4.0 Education and Training

86	37	26	7	32
First and second cycle university programmes	Doctoral programmes	Master degree programmes	ITS Courses	IFTS Courses

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Industry 4.0 for regional specialization areas

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RegioneEmilia-Romagna

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