Industry 4.0 Competence Center on
Advanced Robotics and enabling digital TEchnologies & Systems 4.0

Competence Center ARTES 4.0 Advanced Robotics and enabling digital TEchnologies & Systems 4.0

Lorna Vatta
Executive Director

ITALIAN COMPETENCE CENTERS FINANCED BY THE MINISTRY OF ECONOMICAL DEVELOPMENT

CIM 4.0, Politecnico di Torino

MADE, Politecnico di Milano

BI-REX, Università di Bologna

ARTES 4.0, Scuola Superiore Sant'Anna di Pisa

SMACT, Università degli studi di Padova

MEDITECH, Università degli Studi di Napoli Federico II

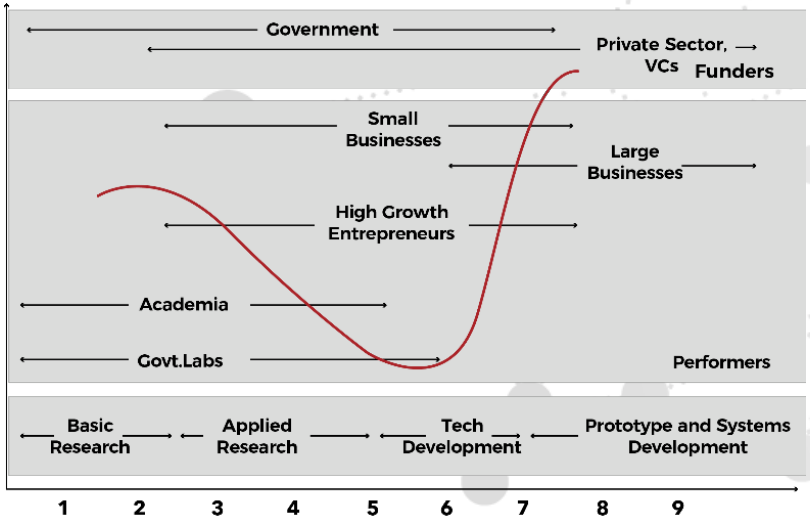
START 4.0, CNR 'Consiglio nazionale delle ricerche'

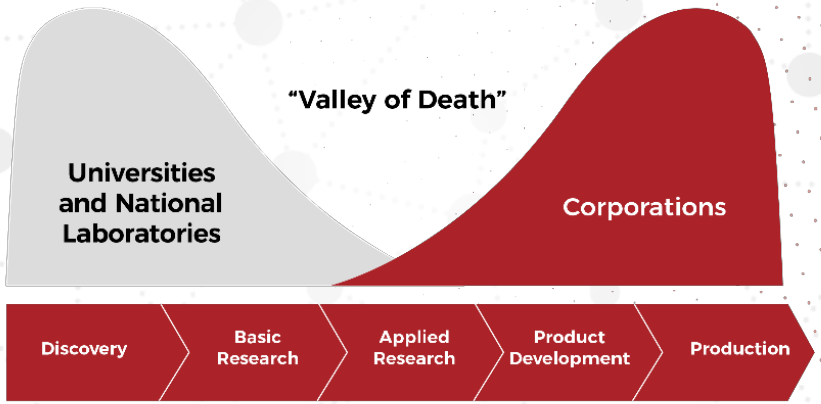
Cyber 4.0, Università degli Studi di Roma "La Sapienza"

ARTES 4.0

- Scuola Superiore Sant'Anna
- Scuola Normale Superiore
- Università di Pisa
- Università degli Studi di Firenze
- Università di Siena
- Scuola IMT Alti Studi Lucca
- Università Politecnica delle Marche
- Università degli Studi di Perugia
- Università degli Studi di Sassari
- Università Campus Bio-Medico di Roma
- Consiglio Nazionale delle Ricerche
- Istituto Italiano di Tecnologia
- European Laboratory for non-linear spectroscopy

Objective: Improve Technology Transfer to effectively overcome the "Valley of Death"





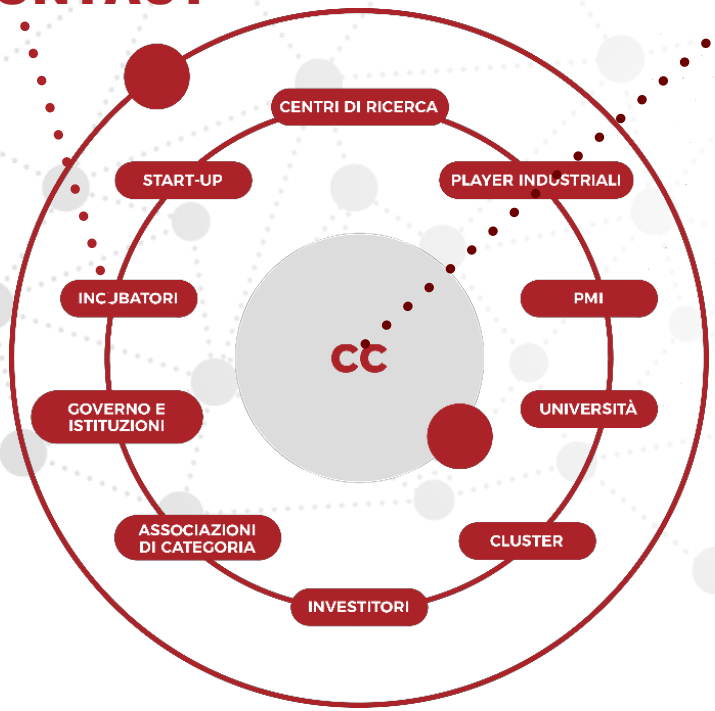
Supportare il livello prototipale, accompagnare fino allo sviluppo commerciale

1	2	3	4	5	6	7	8	9
Basic Principles Observed	Technology Concept Formulated	Experimental Proof of Concept	Technology Validation in lab	Tech. valid in relevant environment	Demonstration in relevant environment	Demonstration in operational environment	System complete and qualified	Successful mission operations

INNOVATION ECOSYSTEM

REGIONAL POINTS OF CONTACT

- Spreading awareness and basic knowledge of Industry 4.0 technologies Measuring the digital maturity level of the companies
- Mapping of dedicated structures for digital transformation
- Addressing companies interested in specialist interventions at Competence Centres



COMPETENCE CENTERS

- Advanced training, business orientation, demo center and development of research projects on industrial research and experimental development
- **Main enablers of the next innovation financing initiatives, from Europe to Italy/regions**

Aim: Create a national network of excellent centres supporting Italian firms for technology transfer.

Distinctive features of ARTES 4.0

- **Network structure** that guarantees the entire national coverage and an international projection on the selected highly specialized topics
- **Inclusive but selective approach**, in federating university partners with a high intensity of affiliation to **Departments of Excellence financed by MUR**, **research institutions and highly qualified training institutes, foundations and partner companies of an innovative nature**.
- **13 Universities and Research Institutes**. In total, CC ARTES 4.0 is made up of 3726 members who, every year: - they produce 5000 publications;- They supervise and train 900 research fellows and 1300 PhD students; - they receive funding of almost € 100 million through tenders, and manage 400 projects with companies
- **a broad partnership (127 Members) of high quality and industrial strength with many SMEs**

13 Universities and Research Centers

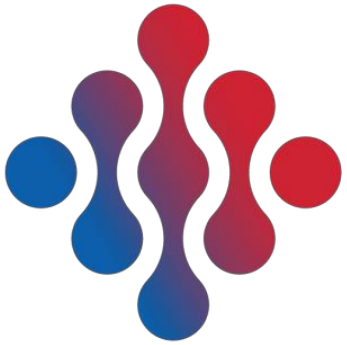
4 Technical Institutes

97 Companies
(**19** Large size –
10 Medium size –
68 Small size)

INAIL: National Institute for Work Safety

Foundations, Associations

ARTES 4.0 PISA HUB

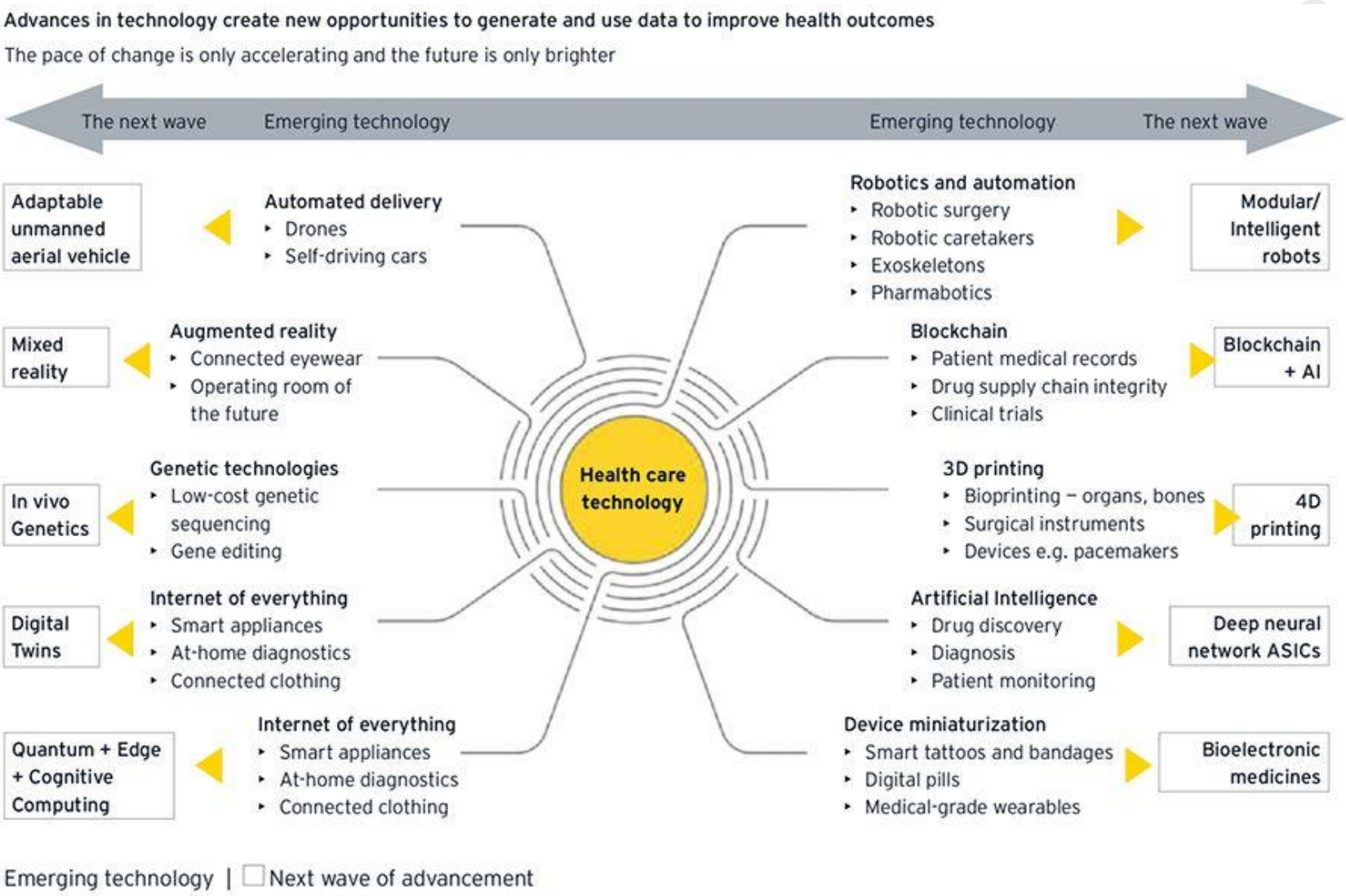


ARTES **ISAAC**

Life Sciences & Healthcare Tech

Ife **S**ciences & He**A**lth**CA**re

Next wave in Health (source: EY)



2021 Initiative: «ISAAC» by ARTES 4.0

	Advanced Manufacturing Robots	Addictive Manufacturing 3D Printing	Augmented Reality	Simulation	Vertical Orizontal Integration	Internet of Things	Mobile Cloud	Cybersec	Big Data BI AI
1 - CLINICAL DATA MANAGEMENT	X	X	X	X	X	X	X	X	X
2 - DIGITAL DIAGNOSTICS	X	X	X	X	X	X	X	X	X
3 - PRIMARY & REMOTE CARE	X	X	X	X	X	X	X	X	X
4 - P5 MEDICINE & BIO-TECH PHARMA	X	X	X	X	X	X	X	X	X
5 - HEALTHCARE ROBOTICS AND COLLABORATIVE TECHNOLOGIES	X	X	X	X	X	X	X	X	X
6 – LOGISTICS, AUTOMATION AND DELIVERY	X	X	X	X	X	X	X	X	X
7 - POPULATION HEALTHCARE MANAGEMENT AND VALUE-BASED MEDICINE	X	X	X	X	X	X	X	X	X

TOPIC 1

CLINICAL DATA MANAGEMENT

- *EHR, interoperability processes, data communication protocols, standards, access control, semantic normalization*
- *Health data management and analysis: multi-modal big data, data analytics and AI-based algorithms*
- *Healthcare platforms/infrastructures and networks for clinical collaboration, assessments, studies and trials*

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TOPIC 2

DIGITAL DIAGNOSTICS

- *Clinical modelling for patient-specific longitudinal analysis*
- *Clinical diagnostics and clinical decision support systems*
- *Medical imaging, medical signals and multi-modal data analysis*

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TOPIC 3

PRIMARY & REMOTE CARE

- *Citizens and patient empowerment and engagement (e.g., personalised coaching, persuasive technologies, tools for AAL)*
- *Telemedicine, telerehabilitation and telemonitoring with a patient-centred approach, involving GP and territory structures*
- *Remote care and longitudinal screening/treatments with IoT-based technologies/device (e.g., wearable/implantable) and software tools*

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TOPIC 4

P5 MEDICINE & BIO-TECH PHARMA

- *Bio-sensors and molecular diagnostics (e.g., DNA sequencing, genetic-based diagnostics)*
- *Bio-markers identification, molecular -omics analysis and radiomics*
- *Bio-tech and nano-tech pharma, bio-based industry, materials and bioinformatics*

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P5 medicine: predictive, personalized, preventive, participatory, and psycho-cognitive

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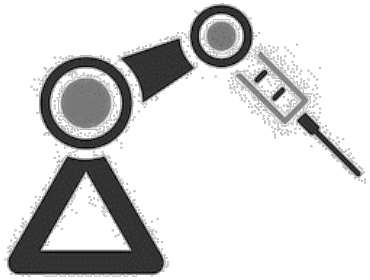

TOPIC 5

HEALTHCARE ROBOTICS AND COLLABORATIVE TECHNOLOGIES

- *Minimally invasive robotic devices/platforms/simulators (soft and not) for diagnosis, treatment and surgery*
- *Regenerative medicine, neural systems, artificial organs and prostheses*
- *Wearable and collaborative robotics, e.g. movement analysis and exoskeletons, for diagnosis, rehabilitation and assistance*

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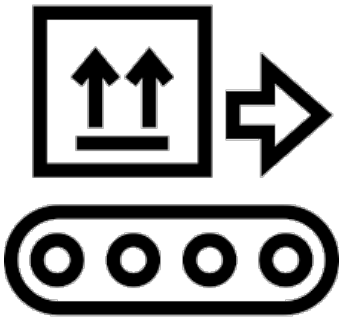

TOPIC 6

LOGISTICS, AUTOMATION AND DELIVERY

- *Tracking and automation technologies, digital communication/management frameworks and cloud systems*
- *Autonomous/semi-autonomous mobile and aerial transportation systems*
- *Logistics and models for pharmaceutical and clinical management*

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TOPIC 7

POPULATION HEALTHCARE MANAGEMENT AND VALUE-BASED MEDICINE

- *Simulations and mathematical/computational modelling and methods*
- *Healthcare management, models and quantitative outcomes*
- *Clinical governance and financial healthcare assessment models*

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2021 planned activities

1. ISAAC mapping: numbers, resources, skills, POC
2. Webinars to present distinctive skills
3. Demo sites and POC creation
4. Participation in Calls
5. Organization of workshops and events
6. Training

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www.artes4.it

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Pontedera, February 2021