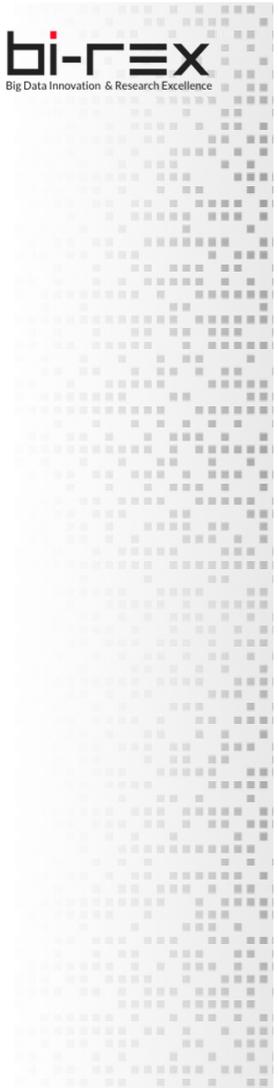




bi-rEX
Big Data Innovation & Research Excellence

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Big Data Innovation & Research Excellence



Main features of the Center

BI-REX is a public-private center assisting SMEs in adopting Industry 4.0 enabling technologies through technology advisory and assessment, design and validation of innovative solutions, and training.

Located in Bologna, BI-REX will gather the know-how of the Emilia Romagna Network of High Technology (existing industrial research Labs, infrastructures, Digital innovation Hubs) but with a **regional, national and international road map**, aimed to **develop solutions for SMEs at high TRL**, near to the market, in particular in the following industrial sectors:

- Mechatronics and automotive
- ICT
- Agri-Food
- Logistics, services and financing
- Biomedicine
- Energy and environment

Partnership (a)

57 partners, 45 private (30 large companies, 12 SMEs, 1 Bank, 1 Consultant and 1 Placement company) and **12 non-private partners**, from **8 Regions** (Emilia Romagna, Lombardia, Sicilia, Piemonte, Campania, Lazio, Marche, Trentino Alto Adige).

- Università di Bologna
- Università di Ferrara
- Università di Modena Reggio Emilia
- Università di Parma
- Università Cattolica di Milano

- Consiglio Nazionale delle Ricerche
- Istituto Nazionale di Fisica Nucleare

- ASTER (also representative of ER Region)
- CINECA
- Istituti Ortopedici Rizzoli
- Bologna Business School
- Fondazione Golinelli (*hosting facility; part of the activities will be also carried out at the Bologna Technopole since 2020*)

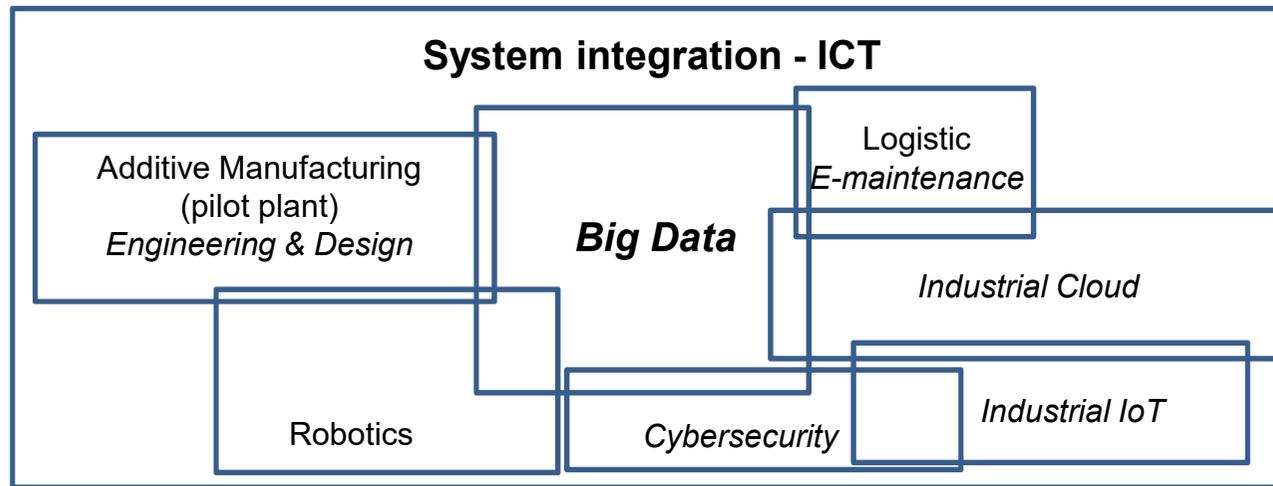
Partnership (b)

| End User Companies | | | |
|--------------------|-------------|-------------|----------------|
| Philip Morris | Poggipolini | Marposs | Marposs Italia |
| IMA | Aetna | Hera | CRIF |
| Samp | Rekeep | Eni | Eurocoating |
| Bonfiglioli | CNS | Ducati | Nanosurfaces |
| Sacmi | Modis | RemTec | Circle |
| Ferrara Bio | UPMC | CAMST | Service |
| | | Link Italia | Alascom |
| | | CONAD | Filippetti |

| Provider Companies | | |
|--------------------|------------|--------------|
| Intesa | Data River | Eascon |
| ALTAIR | IBM | Juno |
| MANZ | Filippetti | Kaitec |
| TIM | | Nier |
| Siemens | | DVP |
| PTC | | Nextema |
| Alascom | | ETNA Bio |
| Aetna | | Fancy Pixel |
| | | Energy Group |
| | | Circle |
| | | Service |
| | | IMA |

Contribution: about € 7.3 M *in cash* and € 7.2 M *in kind*; € 9.2 M are expected from Ministry. 4 Regional *Digital Innovation Hubs* will be involved

Technologies offered & Activities



Research, pilot scale, validation, and consultancy

- Live demos
- Access to best practices and technological Advisory for SMEs
- Support to experimentation/adoption of new I 4.0 technologies
- Startup and acceleration of innovative processes
- Coordination with other Competence Centers in Italy and EU

Learning factory

- Training and Professional Education on I4.0

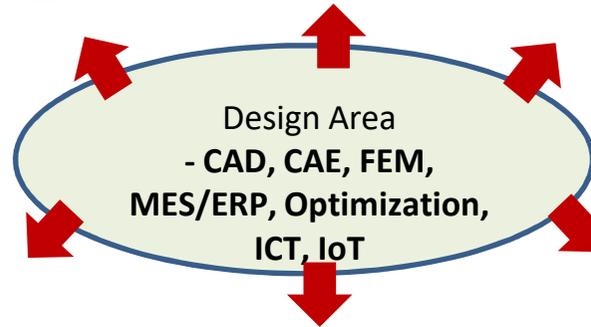
Pilot plant



ADDITIVE MANUFACTURING UNITS
• 1 POWDER BED (Metals)
• 1 FDM (Polymers)



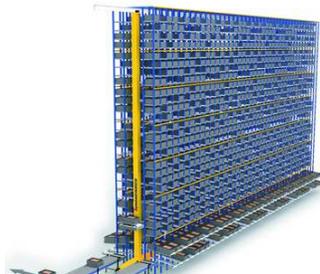
SECONDARY OPERATIONS
- CNC 5 axis
- Laser Cell
- Robot assisted
- Sensors



REVERSE ENGINEERING



**COLLABORATIVE (MAN+COBOT)
ASSEMBLY SYSTEM**



**MULTISHUTTLE WAREHOUSING
SYSTEMS**



Pilot Line Targets

1. Provide a complete production system to the funded projects on which actuating/testing/validating and implementing the proposed solutions, both on the machines and on the systems
2. Provide an off-line (not on revenue stream) production system, available to study reconfiguration and and implementation of hw/sw technologies and new sensors
 3. Make available some basic technologies necessary for the realization of the projects
 4. Share competences among public and private partners, to maximize the innovation capacity
 5. Allow the production of prototypes and small series with high added value
6. Be visible and comprehensible to external users (schools, universities, companies, visitors, partners)
 7. Allowing the implementation of «HANDS-ON» training programs

Innovation Projects

8 Topics, 33 Project targets

1. Additive & advanced manufacturing

2. ICT per macchine e linee di produzione

3. Integrazioni di sistemi

4. Robotica collaborativa, warehousing e AGV

5. Security e blockchain

6. Sistemi avanzati per la gestione dei processi di produzione

7. Big data

8. Sostenibilità e responsabilità sociale



INNOVATION PROJECTS (a)

PROCESS MONITORING AND AUTOMATION

20 End users, 15 Providers, 5
M€

1. Edge computing
2. Predictive Diagnostic
3. Machine Learning
4. Connected IoT
5. IoT for Agriculture
6. Precision Medicine
7. Dynamic CPS
8. Advanced Visual Inspection
9. Cloud
10. Digital Twins
11. Cobots
12. Advanced Robotics

BIG DATA – NEW DIGITAL BUSINESS

10 End users, 5 Providers, 3 M€

1. Integration of digital platforms
2. Blockchain infrastructures
3. Optimization and reconfiguration of production systems
4. B2C Interaction development
5. Security for connected IoT
6. IoT-Cloud for smart Cities
7. Circular Economy for Smart Cities

INNOVATION PROJECTS (b)

LOGISTICS AND SUPPLY CHAIN

7 End users, 5 Providers, 1.5 M€

1. Digital Supply Chain
2. Real Time Traceability
3. AGV e collaborative vehicles
4. Hybrid Warehouses

INNOVATIVE TECNOLOGIES

12 End users, 8 Providers, 2 M€

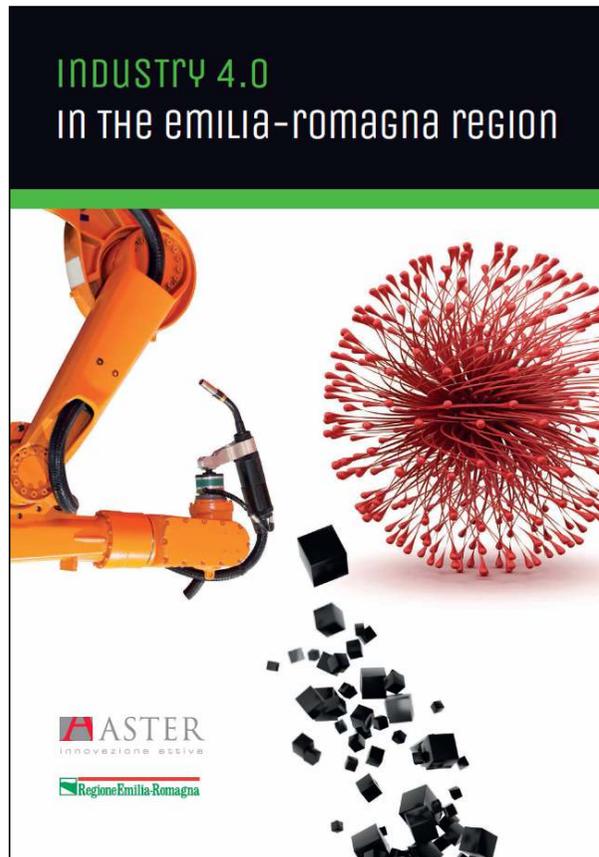
1. Design for Additive Manufacturing
2. Qualification methods AM
3. Security for remote AM
4. Prosthesis AM for surgery
5. New generation Lithium Batteries

SUSTAINABILITY

3 End users, 3 Providers, 1.5 M€

1. Advanced Management of responsibility and safety issues
2. Renewable energies in agriculture
3. Advanced management of industrial wastes
4. Advanced sensing of waste treatment plants

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

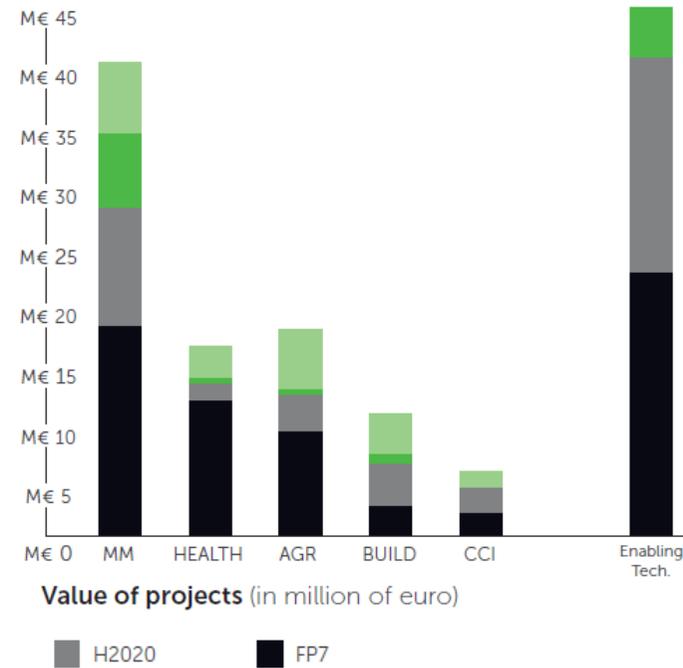
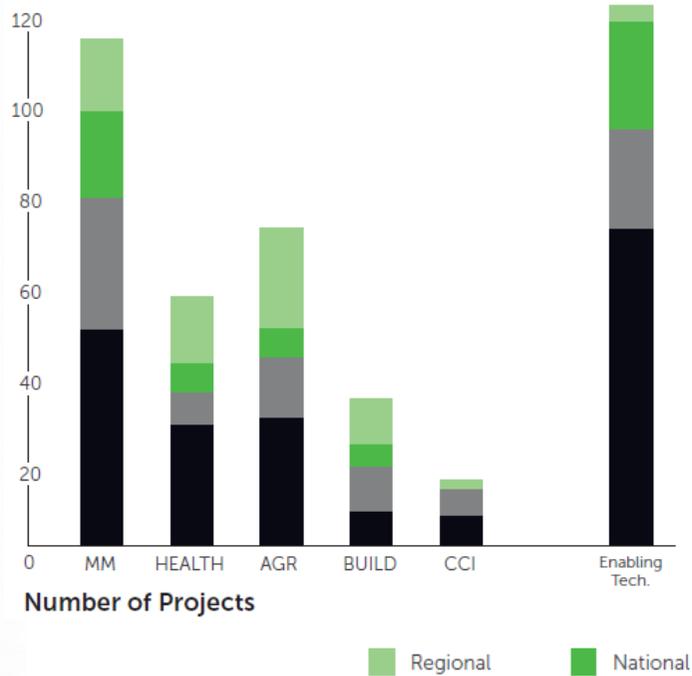


- Education and training
- Skills to support innovation
- Infrastructures
- Project development skills
- Market oriented activities (patents and spin-offs)
- Synergies and vision for Emilia-Romagna S3

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

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

2

Local premises of national consortia

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

1

Data Center Tier 1

At INFN CNAF

63

Laboratories of university departments/research centres

1

Digital Innovation HUB

SMILE European Digital Innovation Hub for Industry 4.0 (I4MS)

3

HPC

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

The Emilia-Romagna Smart Specialization Strategy (S3)

5 areas of specialisation for innovation policies

Pillars of the regional economy (% of the total number of employees)


16,7%
AGRI-FOOD


18,8%
BUILDING
AND CONSTRUCTION


18,2%
MECHATRONICS
AND TRANSPORT


Over **1 million** EMPLOYEES,
more than **50%** of regional employment


80% OF REGIONAL EXPORT

Emerging areas with high growth potential (% of the total number of employees)


8,9%
HEALTH AND WELL-BEING INDUSTRIES


6,9%
CULTURAL AND CREATIVE INDUSTRIES


Over **300,000** EMPLOYEES,
more than **15%** of regional employment

thank you

