



THE ITALIAN INDUSTRY 4.0 COMPETENCE CENTER FOCUSED ON BIG DATA

COMPANY PROFILE

OVERVIEW ON BI-REX

Who we are

BI-REX is one of the 8 Italian Competence Centers funded by the Italian Ministry of the Economic Development within the Industry 4.0 National Plan.

Our **public-private Consortium**, born in 2018, is located in Bologna (Italy) and **gathers in partnership 60 players** among Universities, Research Centers and Companies of excellence. BI-REX is the only Italian Competence Center with an industrial leadership and **our main focus is on Big Data.**

Our Mission

- **Support companies** in their **digitalization and innovation processes** and in the **adoption of enabling technologies** with a view to **Industry 4.0.**
- **Facilitate** the exchange of **“best practices”** and **Technology Transfer.**

[CLICK HERE TO WATCH OUR VIDEO PRESENTATION](#)

BI-REX Big Data Innovation & Research Excellence

Technological focus:

- ❑ Big Data
- ❑ Additive & Advanced Manufacturing

Founders:

- ❑ BI-REX is a Consortium **with an industrial leadership** (SACMI is the lead partner)
- ❑ **12 Institutions**
- ❑ **27 End User Companies**
- ❑ **21 Service Providers**

Financial resources for the first 3 years:

- ❑ **3,85 M€ MiSE** co-financing in order to start up
- ❑ **5,35 M€** to co-finance the companies' **innovation projects** allocated by MiSE
- ❑ **14,4 M€** in cash and kind resources from **partners**



OVERVIEW ON BI-REX

Our structure

We operate within a completed headquarter that allows us to provide activities and services. Our structure covers **1.500 square meters** inside the **Opificio Golinelli**, place of contamination for training, research and business activities: this choice has the specific goal **to support industrial culture, promote networking and share of new concepts and technologies.**

We are an **important aggregation point of public and private excellences** and we aim to **strengthen the network** among all players involved in **digitalization, innovation and training projects, with a view to Industry 4.0.**



OUR PARTNERS

bi-REX
Big Data Innovation & Research Excellence

12

Institutions



27

End Users



21

Technology Service Providers



7

Industries



OUR PARTNERS

48 Companies

- **> 300.000 direct employees**
- **Aggregate turnover > 100 billion Euros**
- **> 200 Technology Transfer (TT) projects**
- **> 11.000 patents**

12 Institutions

- **5 universities, 4 research centers, 1 business school, 1 private foundation, 1 innovation institution**
- **> 1.500 TT projects, 5.000 publications, 35 departments, 2.000 research fellows, 1.500 PhD students, 300 projects funded by competitive calls for a total > 20 million Euros**
- **Cineca + INFN -> 90% of national computing capability; global leadership in computing speed/BIG DATA (supercomputer of Tecnapolo)**

OUR ECOSYSTEM



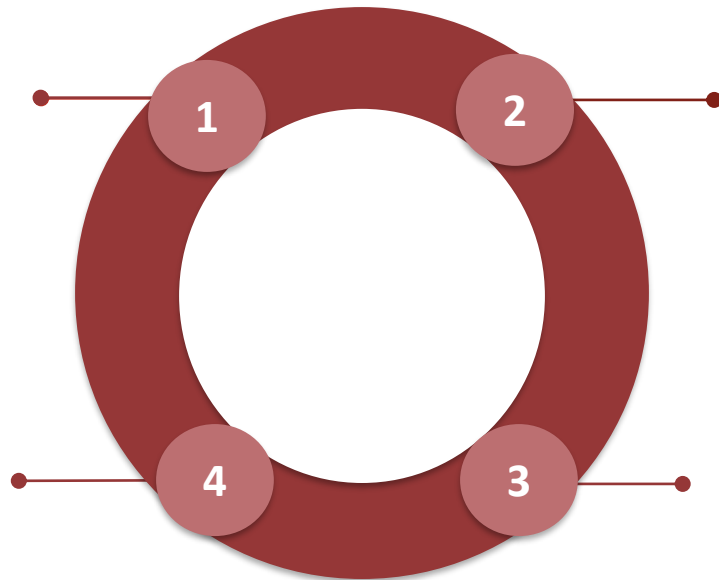
THE ROLE OF OUR PPP

- 1 Encouraging cooperation between public and private** (companies, universities, organizations, research centers)
- 2 Transferring skills, technologies, excellence and resources**, in order to support collaboration activities
- 3 Contributing to the territory's growth and encouraging the creation of professionals** able to operate in Industry 4.0 context
- 4 Enhancing training, skills and potential of the trainees** we host at our headquarters, improving their skills
- 5 Making research and development processes more fluid**, supporting technological innovation processes
- 6 Supporting “made in Italy” system**, to make it more competitive on international markets

OUR STRENGTHS

An **orientation, training and consultancy** system for companies, closely integrated with the *Digital Innovation Hubs*

A wide ecosystem including **industrial innovation projects** and collaborative public-private industrial research projects



Dedicated areas within our structure where conferences, meetings, training and coworking activities can be implemented

A **Pilot Plant** where Industry 4.0 enabling technologies can be implemented and optimized

8 THEMATIC AREAS

1

**Big Data for
Sustainability**

2

**Big Data for
Manufacturing**

3

**ICT for machines and
production lines**

4

**Advanced systems to manage
production processes**

5

Security & Blockchain

6

**Additive & Advanced
manufacturing**

7

**Collaborative Robotics,
Warehousing and AGV**

8

**Sustainability and
Social Responsibility**

IMPLEMENTED ACTIVITIES & KPIs

Implemented activities

Issue and assignment of 3 public calls for innovation projects

Pilot Plant completion and 5G «bubble»

Realization of Services Catalog

Organization of webinars and thematic workshops

Finalization of over 90 training courses

Creation of screening activities and Best Practices in Covid-19 field

Launch of Industry 4.0 Observatory

Launch of BI-REX for Life Science

Euro HPC integration and preparation of > 10 European projects for SMEs

Application of BI-REX ++ as EDIH



Public Calls

3 Calls assigned
35 Projects financed
88 Companies awarded
12 Industries involved



Webinars

53 organized (online)
3.532 Participants
1.860 Participating Companies



Agreements & networking

70 Collaborations initiated (conventions & agreements)
772 Pilot Plant visits
1.042 Companies and Associations met



Training Courses, Workshops, Events

58 organized (in presence and online)
4.687 Participants
1.801 Participating Companies
90 Courses in the Catalog
30 Courses available online
20 Courses lined up

THE ITALIAN *INDUSTRIA 4.0* NATIONAL PLAN

GUIDELINES AND MEASURES

Italian industrial sector features



- Limited number of large players able to lead Italian manufacturing transformation
- Deeply based on SMEs
- Key role played by Universities and Research Centers in development and innovation
- Strong cultural traits of finished products

Government measures



- Skills on I 4.0:
 - ✓ Specific school programs
 - ✓ Academic & research records
 - ✓ **COMPETENCE CENTERS & DIHs**
- Innovative investment
 - ✓ Private Investments
 - ✓ Venture capital
 - ✓ Start-ups
- Enabling Infrastructures
- Public Support Instruments

The Italian Government earmarked 20 billion € for the period 2017-2020

THE 8 COMPETENCE CENTERS



4 Universities + 1 Public Body
+ 39 Companies

**DEMONSTRATION ISLANDS ON
KEY ENABLING TECHNOLOGIES**

+ CIM4.0

2 Universities + 23 Companies
MANUFACTURING 4.0



4 Public Bodies + 33 Companies
**STRATEGIC INFRASTRUCTURE
SECURITY and OPTIMIZATION**

127 Members including 35 Founders,
13 Research Bodies, 97 Companies, etc.

**ADVANCED ROBOTICS and
ENABLING DIGITAL TECHNOLOGIES**



8 Universities + 4 Public Bodies
+ 30 Companies

SOCIAL, MOBILE, ANALYTICS, CLOUD, IOT



5 Universities + 7 Public Bodies
+ 48 Companies

BIG-DATA and ADDITIVE MANUFACTURING



8 Universities + 131 Companies
(including 109 SMEs)

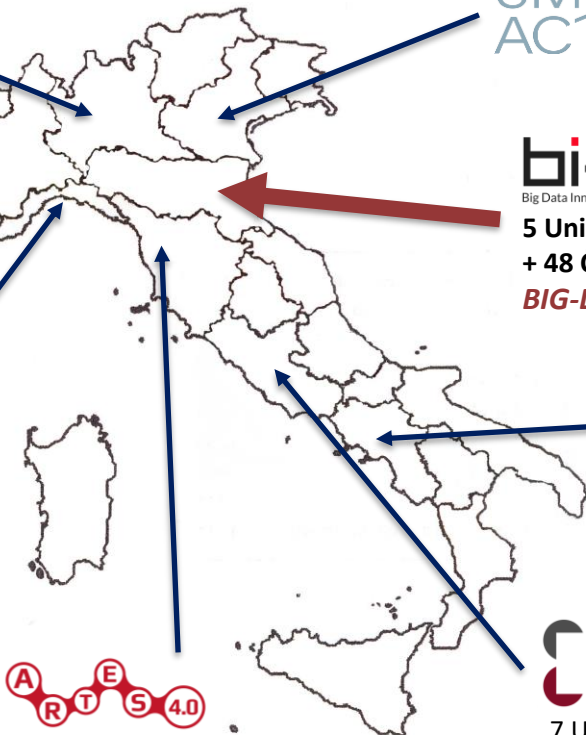
**SOCIAL TECHNOLOGIES and
BLOCKCHAIN**



CYBER 4.0
CYBERSECURITY COMPETENCE CENTER

7 Universities + 2 Public Bodies
+ 37 Companies

CYBER-SECURITY



bi-REX

Big Data Innovation & Research Excellence

COMPETENCE CENTER INDUSTRY 4.0

BI-REX SERVICES
AND CATALOGUE

OUR SERVICES



Test-Before-Invest

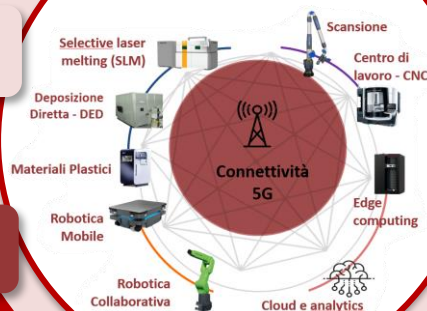
Innovation Projects



Orientation



Pilot Plant



Access to Grants



Training



Open Innovation



Consulting



Location



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Big Data Innovation & Research Excellence

COMPETENCE CENTER INDUSTRY 4.0

PUBLIC CALLS FOR
INNOVATION PROJECTS

A KEY ACTIVITY FOR BI-REX

Main features of our calls

The calls for the realization of **innovative and industrial research projects** represent a **cornerstone among our activities**: we have already **issued three calls** for companies.

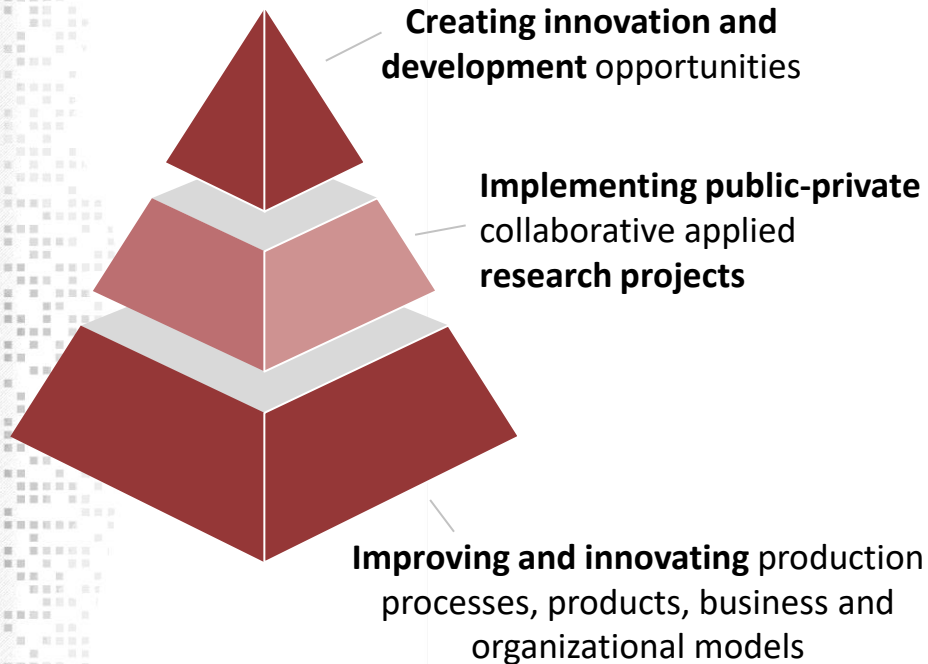
Among all Italian Competence Centers, **BI-REX is the one which allocates most of MISE co-financing to industrial research projects**: the goal is to accelerate the innovation processes of companies.

The total amount allocated for our calls is **5.4 million Euros**, in order to **finance more than 30 innovation projects**.



BI-REX CALLS

The Goals



The principles

- 1** Innovativeness of project proposals
- 2** Quality of Industrial Plan implementation
- 3** Aggregation/Partnership among two or more companies
- 4** SMEs involvement in partnership agreement
- 5** Collaboration with Universities and Research Centers

CALLS MAIN PRINCIPLES

1

Improvement and innovation of production processes, product, business and organization models, to favor company competitiveness

2

Innovativeness of project proposals

3

Quality of industrial plan implementation

4

Aggregation/Partnership among two or more companies

CALLS MAIN PRINCIPLES

5 SMEs involvement in partnership agreement

6 Collaboration with Universities and Research Centres

7 Positive impact on the framework of the UN Sustainable Development Goals 2030

8 Use of BI-REX services and/or infrastructures

BI-REX PUBLIC CALLS FIGURES



3 Public Calls
launched and assigned



35 Projects
>**50** Use cases



5,4 Million
Euros allocated



88 Companies
awarded



+7 Million Euros
Corporate investments
activated



12 Industries
involved

THE FIRST BI-REX CALL

17 Projects

3.1 mln € - allocated Budget

7 Thematic Areas

Area	N. Projects	Budget
Big Data for Sustainability	3	600.000 €
Big Data for Manufacturing	4	750.000 €
ICT for machines and production lines	2	400.000 €
Advanced systems to manage production processes	2	340.000 €
Security & Blockchain	1	160.000 €
Additive & Advanced Manufacturing	3	500.000 €
Collaborative Robotics, warehousing and AGV	2	350.000 €

THE SECOND BI-REX CALL

7 Projects

1.2 mln € - Allocated Budget

4 Thematic Areas

Area	N. Projects	Budget
Sustainability and Social Responsibility	2	300.000 €
Advanced systems to manage production processes	3	500.000 €
Security & Blockchain	1	200.000 €
Collaborative Robotics, warehousing and AGV	1	200.000 €

THE THIRD BI-REX CALL

11 Projects

1.1 mln € - Allocated Budget

5 Thematic Areas

Area	N. Projects	Budget
ICT for machines and production lines	1	100.000 €
Advanced systems to manage production processes	4	400.000 €
Security & Blockchain	2	200.000 €
Additive & Advanced Manufacturing	1	100.000 €
Sustainability and Social Responsibility	3	300.000 €

THE 35 INNOVATION PROJECTS

BIG DATA SUSTAINABILITY

- Smart City Services for Circular Economy and Sustainable Applications
- Big Data for Prevention Models Development to support precision medicine in the oncology sector
- Integrated IoT-Cloud platforms for Facility Management Services

BIG DATA MANUFACTURING

- Big Data for Optimization and Reconfiguration of Production Lines
- Productive Processes Management through Edge Computing
- Integration Technologies Connected IoT
- Integration Solutions with Low Latency and High Availability Industrial Cloud

ICT MACHINES & PRODUCTION LINES

- Platforms for the production process optimal maintenance
- Predictive Diagnostics based on Data Analytics and Machine Learning Techniques
- Platforms for the management of technical documentation through Augmented Reality (AR)

ADVANCED SYSTEMS FOR PRODUCTION PROCESSES

- Traceability of Products and Processes in Real Time (*2 projects*)
- Visual Inspection / Selection for quality control
- Digital Twin for production lines configuration of complex services and systems (*2 projects*)
- Platforms for the management of production systems through Augmented Reality (AR)
- Digitalization of processes, services and 4.0 technologies applied to Healthcare Structures systems (*2 projects*)
- Digital Twin for cold forming of automotive components

THE 35 INNOVATION PROJECTS

SECURITY & BLOCKCHAIN

- IoT Connected Security Platforms in Distributed Production Lines
- Distributed and secure platforms for data sharing between interconnected objects and for servitization
- Management of document flows in the logistics field
- Platforms for data collection and certification related to crops for food purposes

ADDITIVE & ADVANCED MANUFACTURING

- Design for AM Metal components
- Development of AM Technologies for Metal material
- Tailor made Prosthesis Design and implementation for Surgical Replacement
- Cooling systems to improve the energy efficiency of electronic power converters

COLLABORATIVE ROBOTICS, WAREHOUSING & AGV

- Collaborative Robotics for Productive Processes
- Flexible Automatic Transport Systems (AGV / LGV / Collaborative Vehicles) and Advanced Storage Systems
- Automation for assembly of lithium cells and lbatteries

SUSTAINABILITY AND SOCIAL RESPONSIBILITY

- Optimization of agrovoltaic systems management
- Traceability of tomato supply chain in the field of precision and interconnected agriculture
- Development of Electric Powertrain for high performance motorcycles
- Sustainable heat (2 projects)

COMPLETED PROJECTS: IPPODAMO

Name	Interactive Planning Platform for city District Adaptive Maintenance Operations - IPPODAMO
BI-REX call	Call 1
Area	Big Data for Sustainability
Sub-area	IoT - Cloud integrated platforms for Facility Management services
Objectives	The IPPODAMO project aims to prototype development of an advanced planning system based on a data integration platform inherent to city, citizen, and urban facility management services



ippodamo project

UNA PIATTAFORMA DIGITALE PER MIGLIORARE LA GESTIONE DELLA CITTÀ



rekeep  

rekeep  Digital 

Scientific Partnership: 

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COMPLETED PROJECTS: BDFM

Name	Big Data 4 Manufacturing
BI-REX call	Call 1
Area	Big Data for Manufacturing
Sub-area	Big Data for Optimization and Reconfiguration of Production Lines
Objectives	The project aims to overcome the limitations of the main analytics solutions available on the market and to build a Big Data platform of general applicability in Industry 4.0



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**Scientific
Partnership:**



COMPLETED PROJECTS: 5G CONNECT

Name	Integration of IoT connectivity via 5G network – 5GConnect
BI-REX call	Call 1
Area	Big Data for Manufacturing
Sub-area	Integration Technologies for Connected IoT
Objectives	The project aims to study innovative solutions to integrate data connectivity in industrial production facilities, focusing on the use of 5G technology as a preferred infrastructure option



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 **Bonfiglioli**
We engineer dreams

 **SACMI**

 **POGGIPOLINI**

 **ROBOPAC**



PHILIP MORRIS
INTERNATIONAL

 **IMA**
SPA

 **imola**
informatica

 **DataRiver**
open source data management

SIEMENS

 **LUTECH**
CDM

**Scientific
Partnership:**



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COMPETENCE CENTER INDUSTRY 4.0

PILOT PLANT

OUR PILOT PLANT

Main features

The Pilot Plant is an **advanced production line**, where new **Industry 4.0 technologies** are **integrated with traditional ones**, in a **digitally interconnected environment**.

It is a **smart factory** where companies and professionals involved in Industry 4.0 context can test **high added value solutions and processes**.

The Pilot Plant has been **designed in order to:**

- Make available a **production area** for **Test Before Invest activities**;
- **Support technological innovation** of enterprises;
- Support BI-REX services such as "**hands on**" **training** and business orientation.

GOALS AND KEY ASPECTS

1

To make available to companies a complete and integrated production system, where proposed solutions and necessary technologies can be implemented for the realization of innovative projects

2

To have a production system without company production constraints; within this system, which can be reconfigurable and flexible on demand, development activities and industrial research can be implemented

3

To use, integrate and transfer the technological skills of our public and private partners, in order to maximize innovation production ability

GOALS AND KEY ASPECTS

4

To allow the **realization of advanced prototypes** and high added value small series, **making them available on the market**

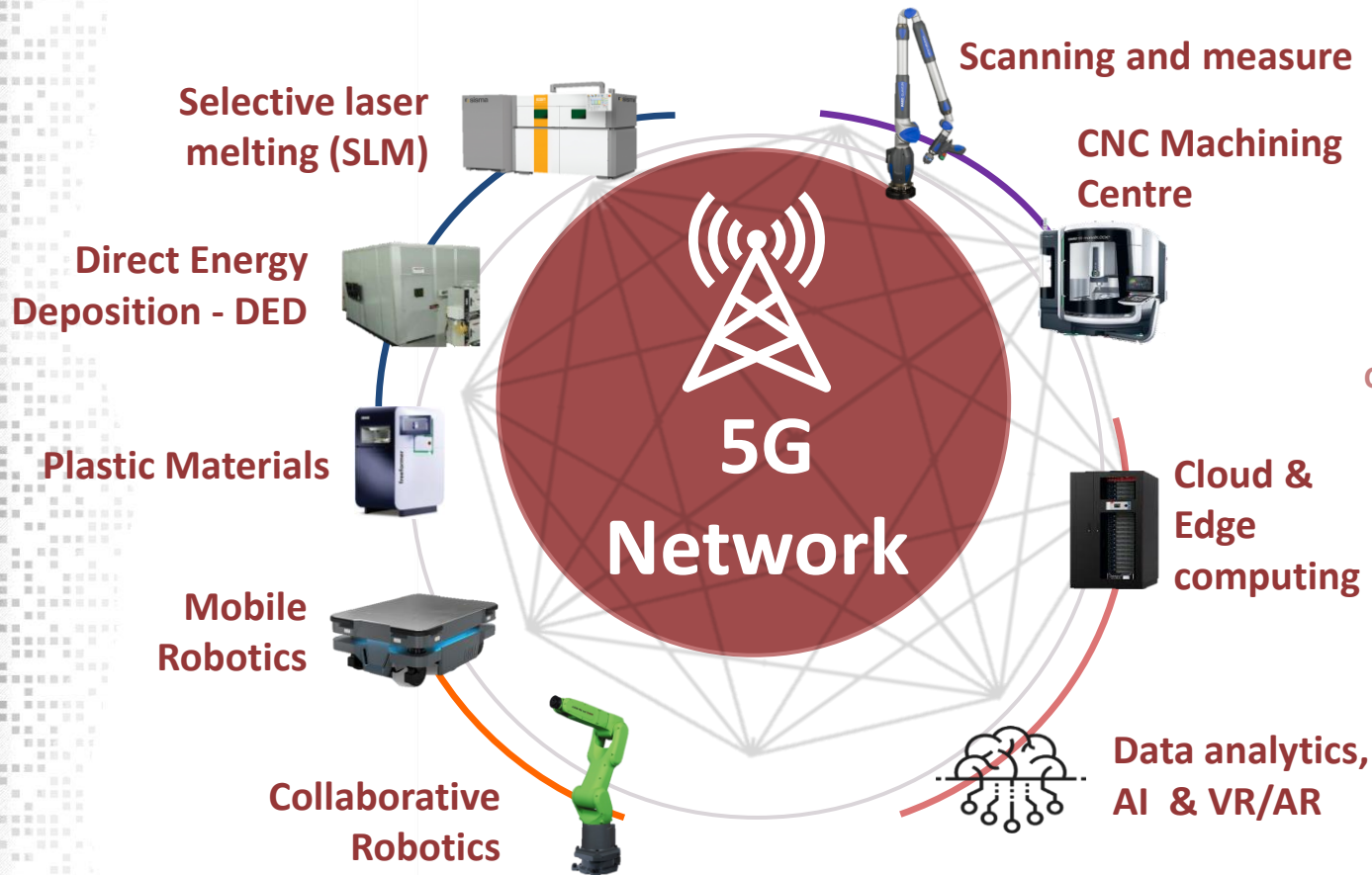
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To be **recognisable and understandable for all players** (schools, universities, companies, visitors, partners) involved in **Industry 4.0** processes

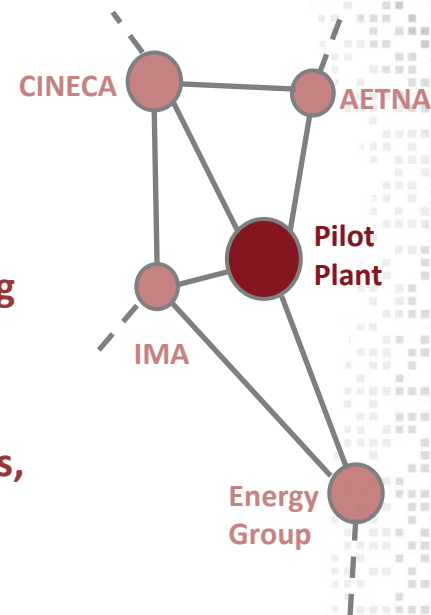
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To allow the **realization of «hands-on» educational and training programs**, for partners and Smes

OUR PILOT PLANT



Innovation Center Network *Federated Technologies*



BASIC STRUCTURE

BIG DATA and INTERNET OF THINGS (IoT)

Development of IoT platforms, 5G connectivity, data acquisition and elaboration on local datacenter (private cloud) and remote cloud, Big-Data Analytics and Artificial Intelligence (AI) techniques, Digital Twin

ADDITIVE MANUFACTURING

Additive production of metals through powder-bed laser melting and direct deposition, integrated with secondary processing (heat treatments, laser hardening, wire cutting), plastic materials printing

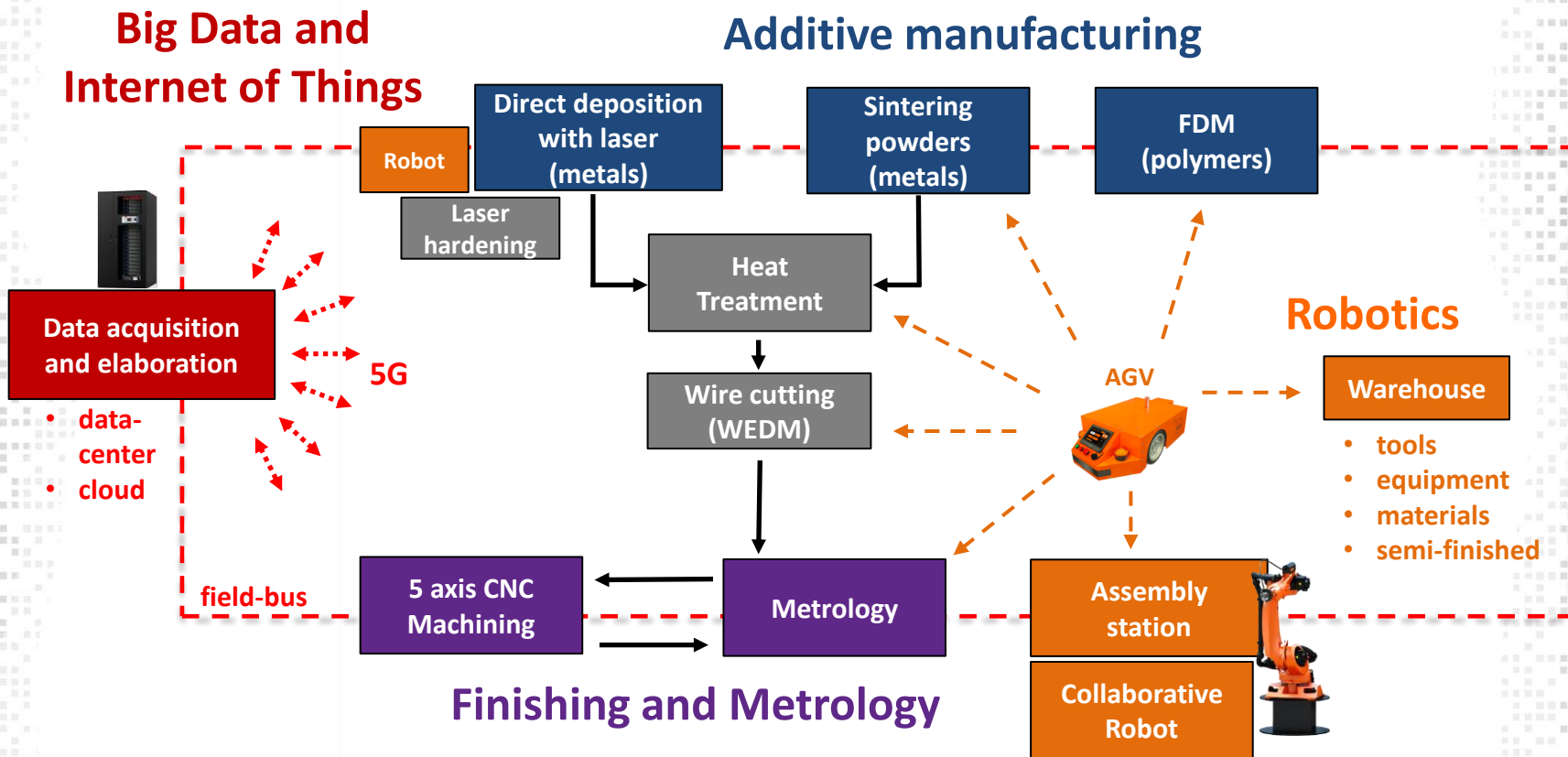
ROBOTICS

Implementation of advanced robotics, integration of mobile and collaborative robots for assembly tasks, logistics and warehousing, production line feeding and flexible automation

FINISHING AND METROLOGY

Manufacturing and finishing through 5-axis computer controlled (CNC) machining, automated dimensional control system, contactless laser scanning and reverse engineering

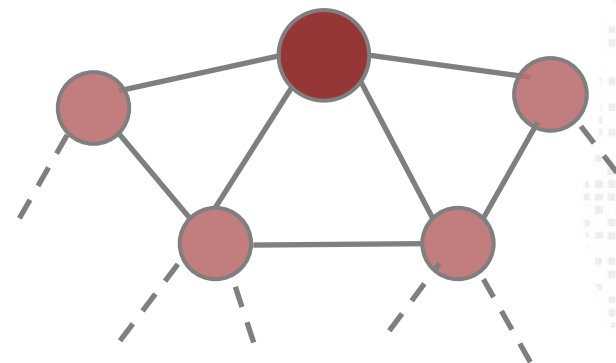
FUNCTIONAL MAP



INNOVATION CENTERS NETWORK

A great opportunity for companies

The Pilot Plant is the central hub of a digitally interconnected network of our partners' innovation centers.



Through this network, **we are able to offer** companies:

- **Access to specific technologies and equipment** of these centers;
- **Access to transversal thematic areas** (biomedical, sustainability, etc.), thanks to data sharing and management;
- **Data collection and integration** from production structures, for Big Data and Analytics applications;
- **Value-added services**, in order to implement **consultancy and training activities**.



COMPETENCE CENTER INDUSTRY 4.0

TRAINING ACTIVITIES

BI-REX TRAINING ACTIVITIES

1

Advanced Training Courses, with University Professors and Business Managers



2

Hands-on courses: use cases, use of technologies, companies' case studies



3

Use of our Pilot Plant and of the **Innovation Centers** network

OUR WEBINARS

53

Webinars
(online)



3.532

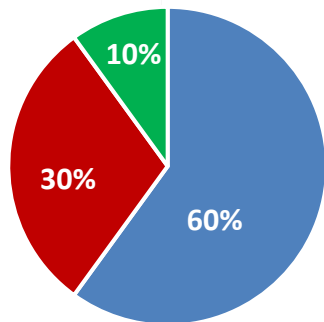
participants



1.860

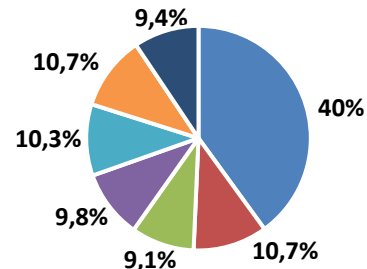
companies

Participants



■ Big Companies ■ SMEs ■ Universities

Corporate roles of participating companies



■ CEO ■ Technical Referent ■ Account Manager
■ R&D ■ Project Manager ■ Business Manager
■ HR

OUR COURSES

14

*Courses
(in presence)*



285

participants



71

companies

7 THEMATIC AREAS

Big Data

ICT Advanced systems to manage
production processes

Security & Blockchain

Additive & Advanced Manufacturing

Collaborative Robotics, warehousing & AGV

Managerials

Sustainability & Social Responsibility

20

*Courses scheduled in
next 12 months*

90

*Overall Courses
in the Catalog*

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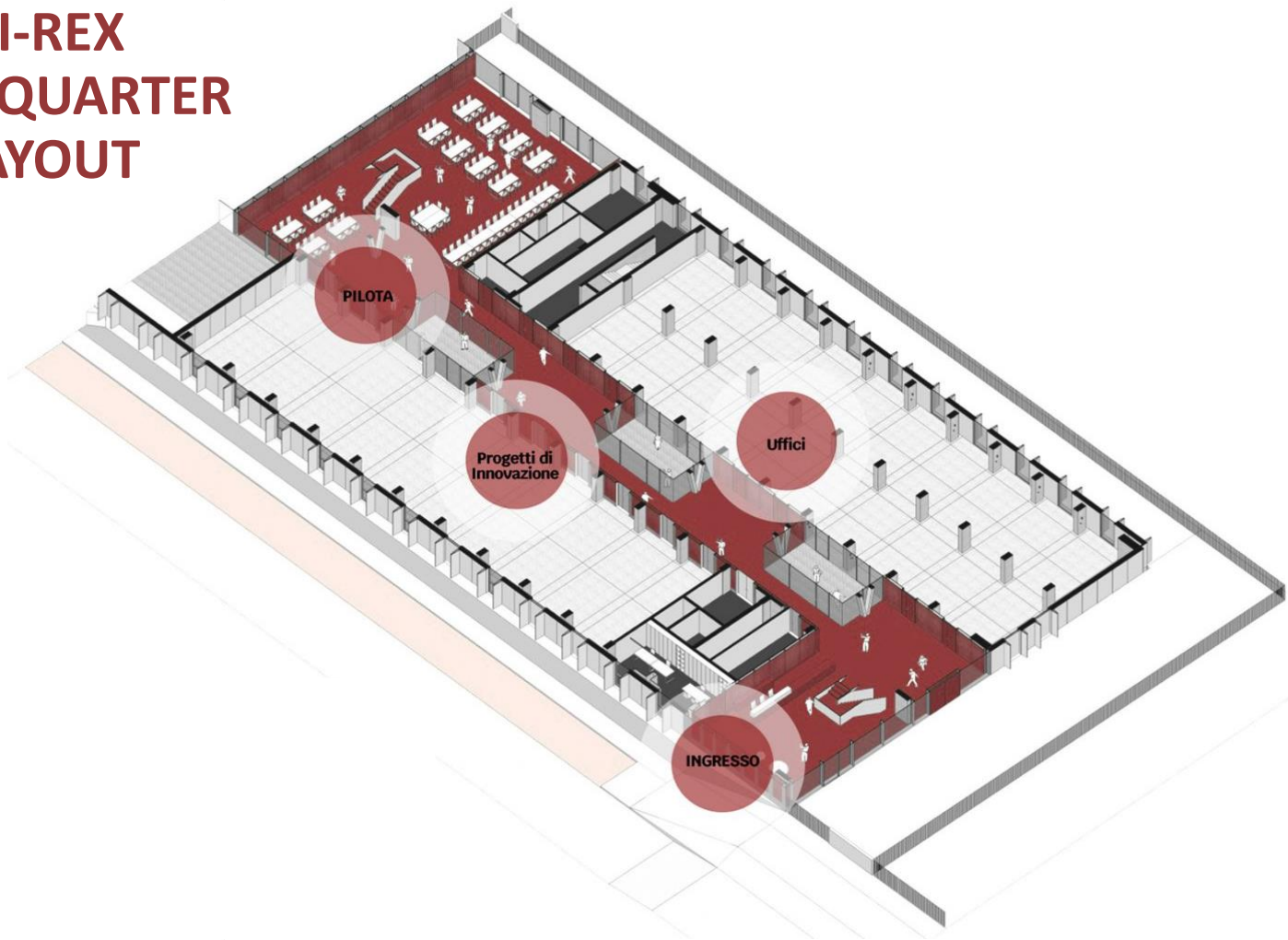
Big Data Innovation & Research Excellence

COMPETENCE CENTER INDUSTRY 4.0

GOVERNANCE

EXECUTIVE COMMITTEE		STEERING COOMMITEE	
Domenico Bambi - President	Sacmi	Luca Tomesani - President	UniBO
Francesco Millo	Bonfiglioli	Andrea Torcelli	Bonfiglioli
Michele Poggipolini	Poggipolini	Dario Rea	IMA
Claudio Melchiorri	UniBO	Valentina Marchesini	Marchesini
Cesare Stefanelli	UniFE	Massimo Casalboni	Philip Morris
Andrea Zanotti	UniBO	Gildo Bosi	Sacmi
BI-REX TEAM		Leda Bogni	ArtEr
Stefano Cattorini	General Manager	Maurizio Sobrero	BBS
Simona Campo	Head of Administration	Roberta Turra	Cineca
Andrea Volta	Administration Area	Marco Sacco	CNR
Francesco Meoni	Head of Pilot Plant	Sergio Bertolucci	INFN
Antonio Galantucci	Pilot Plant Operator	Alberto Leardini	IOR
Gianmarco Moretti	Pilot Plant Operator	Ettore Capri	UniCATT
Luca Cotto	Pilot Plant Operator	Massimo Bertolini	UniMORE
Danilo Mascolo	Head of Business Development	Roberto Menozzi	UniPR
Alberto Gualtieri	Business Development Area	Simone Di Piazza	Ducati
Manlio Urbano	Head of Communications	Guido Cometti	Link Italia
Massimo Pulvirenti	Head of Training Services	Gabriele Canini	Aetna
Valentina Matrà	Training Services Program Manager	Maurizio Massanelli	Rekeep
Serena D'Angelo	Head Secretary	Francesca Zarri	CNS
Leonardo Lio	HR Generalist		

BI-REX HEADQUARTER LAYOUT



bi-rEX

Big Data Innovation & Research Excellence

COMPETENCE CENTER INDUSTRY 4.0

INTEGRATIONS

CONTRIBUTION

MISE

(Italian Ministry of
Economic
Development)

Up to 9.200.000 € for 3 years:

- Up to **3.850.000 €** in order to set up the **Competence Center** and to implement the **activity program**
- Up to **5.350.000 €** as **contribution** to the **Innovation Projects**, with a maximum amount of 200.000 € for every project

CONSORTIUM MEMBERS

Up to 14.400.000 € for 3 years:

- Up to **7.200.000 €** in «*cash*»
- Up to **7.200.000 €** in «*kind*»

BI-REX AND EMILIA-ROMAGNA DATA VALLEY

Emilia-Romagna Region can be considered today as the **European Data Valley** and **Bologna** is an **important hub of HPC/AI European infrastructure**, thanks to presence of:

- ❑ The European Centre for Medium-Range Weather Forecasts (**ECMWF**) Data Center and Supercomputing facility
- ❑ The **CINECA** data center towards exascale computing
- ❑ The **INFN** data center towards extreme HPTC
- ❑ The **European High Performing Computing Centre HPC**
- ❑ The National Agency **Italia Meteo**
- ❑ Istituto Ortopedico Rizzoli (**IOR**) biobank center
- ❑ **INAF** Cherenkov Telescope Array
- ❑ **IBM** center Big Data and AI for aging



Highlander
High performance computing
to support smart land services

*BI-REX is a key player in Emilia-Romagna Data Valley,
perfectly integrated within Bologna hub and local Technopole*

OUR CONTACTS



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