Data Economy in Emilia-Romagna

Morena Diazzi
General Manager
Regional Government
General Directorate for
Knowledge economy, Labour and Enterprise

Montreal, September 2019
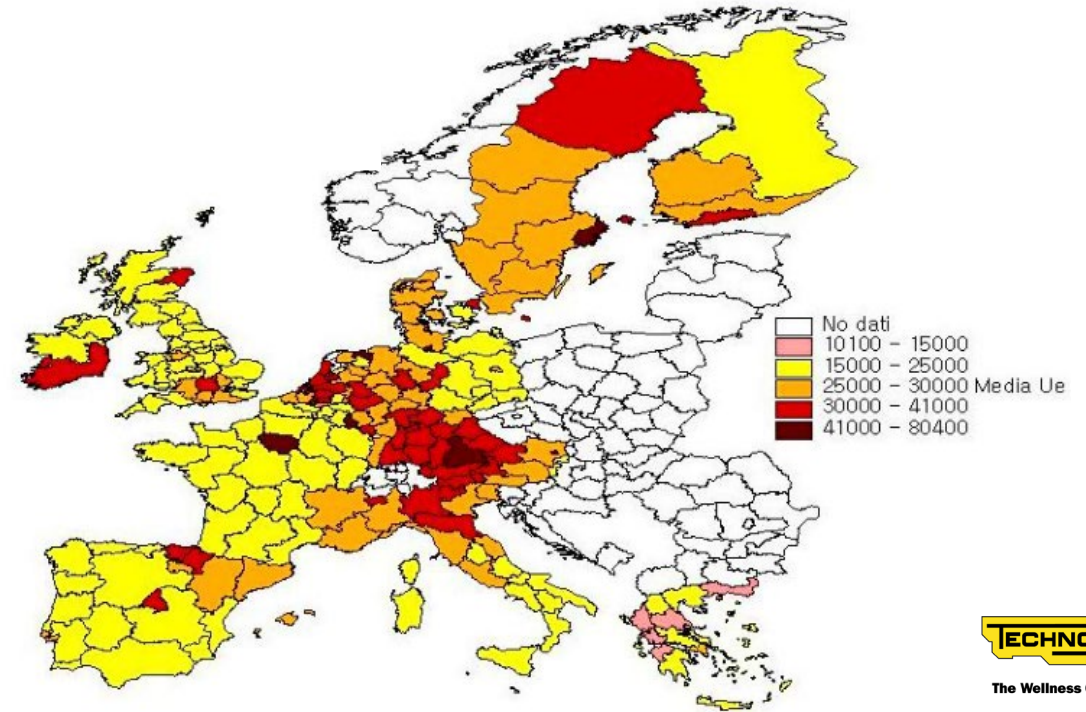
the 1st Canada-Italy Business Forum on AI

EUROPEAN UNION
European Structural and Investment Funds

Regione Emilia-Romagna

Emilia-Romagna Region

Main Indicators

Population	4.45 million
GDP per capita	34500 €
Export	63 billion €
Employment rate	70,2%
Unemployment rate	5,5%
No. companies	372.000
R&D/GDP	≈ 2%

1st region by number of per capita patents

2nd region by number of innovative companies

1st region by number of Erasmus students

1st region by per capita export

University System, Research Centres and International Agencies

Regione Emilia-Romagna

UNIVERSITIES →

PIACENZA
Università
Cattolica

PIACENZA
Politecnico di
Milano

PARMA
Università di
Parma

REGGIO
EMILIA
Università di
Modena e
Reggio Emilia

MODENA
Università di
Modena e
Reggio Emilia

FERRARA
Università di
Ferrara

RAVENNA
Università di
Bologna

FORLI'
Università
di Bologna

CESENA
Università di
Bologna

RIMINI
Università di
Bologna

Bologna
Università di
Bologna

Bologna
Università
John Hopkins

Bologna
Bologna

National and International Research Centres:
(Cineca, CNR - National Research Council, INFN - National Institute for Nuclear Physics, INAF - National Institute for Astrophysics, ENEA - National Agency for New Technologies, Energy and Sustainable Economic Development, CMCC - Centro Euro-Mediterraneo sui Cambiamenti Climatici, INGV - Istituto Nazionale di Geofisica e Vulcanologia)

International Authorities/Agencies:
European Food Safety Authority, European Centre for Medium-Range Weather Forecasts

ART-ER
(Attractivity, research, territory/technology)

Regional University System (7 Universities)
- 400 courses (Three-year and magistral degrees)
- 153 master
- 126 Specialization Courses
- **160 thousand students**

- Bologna Business School (Master/MBA)
- PhD and International Data Science Phd
- School of Advanced Studies in Food Safety
- MUNER (Motor vehicle in E-R)
- High Education Courses (Climate Change, Homeland Security)
- 7 Foundations ITS with 29 courses

- 4 Large Research Infrastructure:

  Big Data Technopole
  INAF Radio Telescopes
  ENEA Brasimone (Energy)
  CICLoPE Long Pipe Experiments

The Ecosystem: Technopoles, Laboratories, S3 areas, Incubators, Fablabs, Open Laboratories Network

Regione Emilia-Romagna

🟢 **TECHNOPOLES NETWORK**
10 Insfrastructures
20 Locations

🔵 **HIGH TECHNOLOGY NETWORK**
82 Industrial Reserach Laboratories
14 Innovation Centres

🔴 **INCUBATORS NETWORK**
75 Public and Private organisations

🟠 **DIGITAL MANIFACTURING NETWORK MAK-ER**
22 Fab Labs and Maker Spaces

🟣 **OPENA LABORATORIES NETWORK**
10 Equipped Areas with hi-tech solutions

🟡 **LOCAL NETWORK «SPAZI AREA S3»**
10 Offices located in the Technopoles to assist highly-silled (young) people

🟣 **ITS NETWORK**
7 Hi.Tech Schools
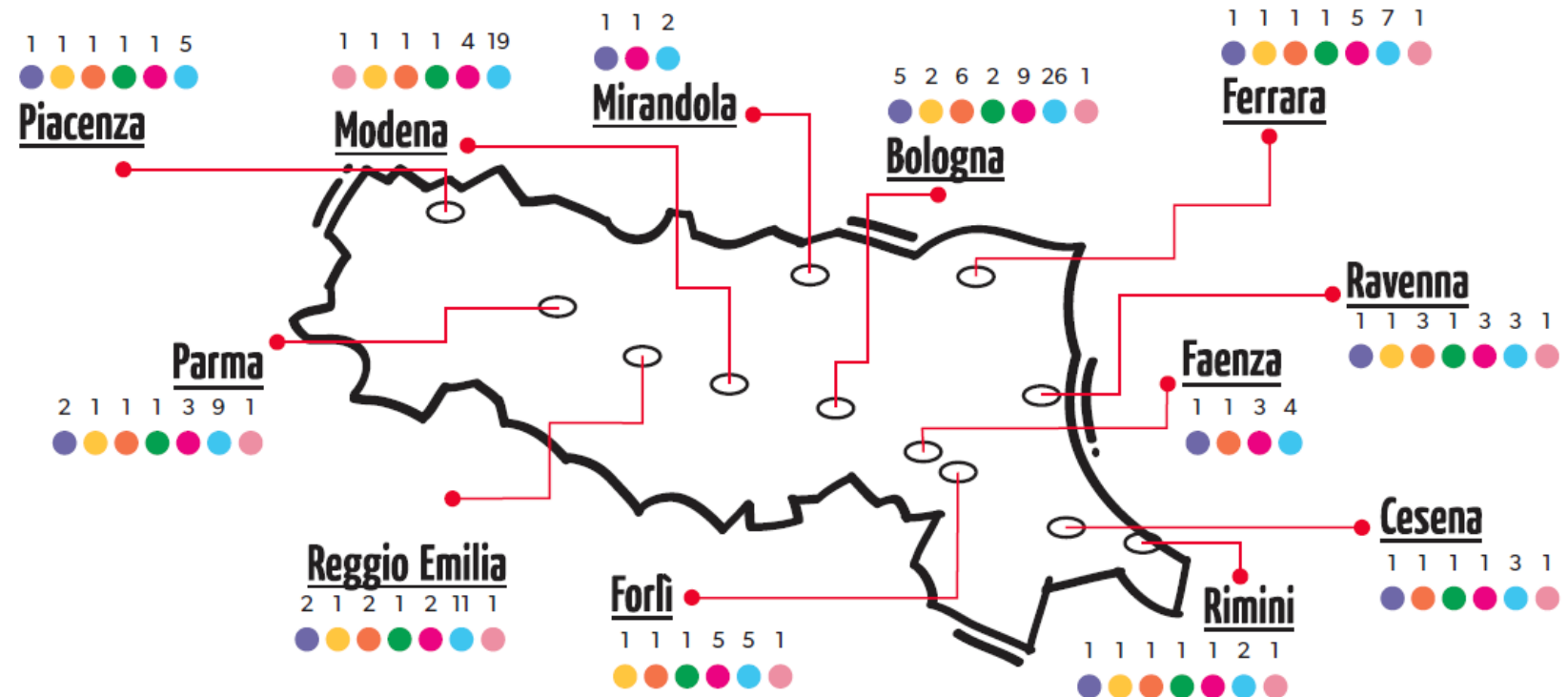
Specialization and Interdependence System

CLUST-ER AGRIFOOD AGROALIMENTARE

CLUST-ER BUILD EDILIZIA E COSTRUZIONI

CLUST-ER GREENTECH ENERGIA E SOSTENIBILITÀ

CLUST-ER CREATE CULTURA E CREATIVITÀ

CLUST-ER HEALTH SALUTE E BENESSERE

CLUST-ER INNOVATE INNOVAZIONE NEI SERVIZI

CLUST-ER MECH MECCATRONICA E MOTORISTICA

associazione **BigData** from volume to value

MUNER
Motorvehicle University of Emilia-Romagna

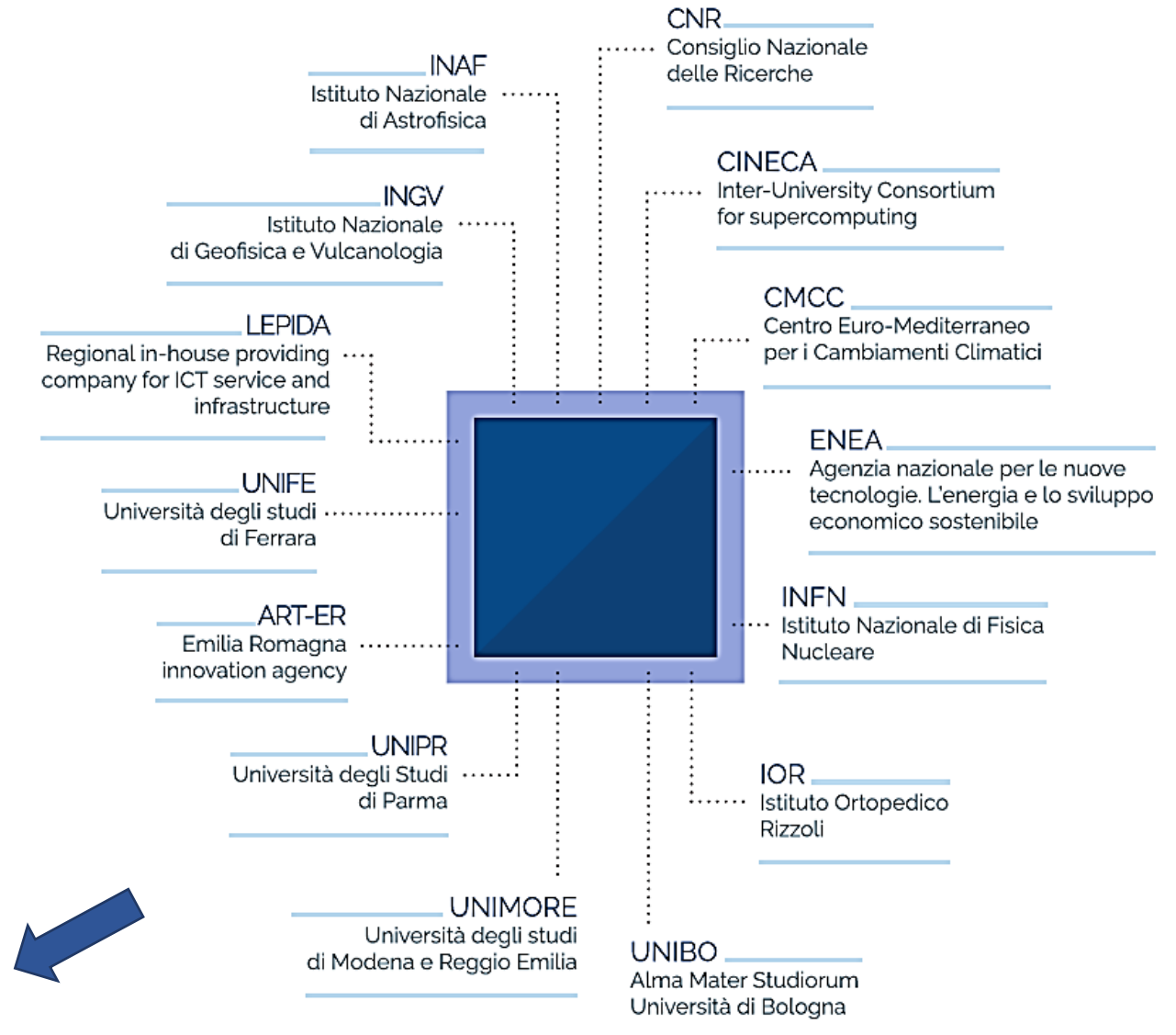| Total memberships	463
Research Labs & Innovation Centres (High Technology Network)	201
Companies	204
Education & Training	32
Others	26

463 members

Community of public and private subjects (research centres, companies, training institutions) that share ideas, skills, tools, resources to support the competitiveness of Emilia-Romagna production systems and to partecipate to National, European and International projects and initiatives.

Big Data Association - BDA

- ➢ Governance

- ➢ Awareness and inclusiveness

- ➢ National and International Networking

- ➢ Funds raise

Supported by Emilia-Romagna Region

Towards the new Big Data Foundation

INAF
Istituto Nazionale
di Astrofisica

CNR
Consiglio Nazionale
delle Ricerche

INGV
Istituto Nazionale
di Geofisica e Vulcanologia

CINECA
Inter-University Consortium
for supercomputing

LEPIDA
Regional in-house providing
company for ICT service and
infrastructure

CMCC
Centro Euro-Mediterraneo
per i Cambiamenti Climatici

UNIFE
Università degli studi
di Ferrara

ENEA
Agenzia nazionale per le nuove
tecnologie. L'energia e lo sviluppo
economico sostenibile

ART-ER
Emilia Romagna
innovation agency

INFN
Istituto Nazionale di Fisica
Nucleare

UNIPR
Università degli Studi
di Parma

IOR
Istituto Ortopedico
Rizzoli

UNIMORE
Università degli studi
di Modena e Reggio Emilia

UNIBO
Alma Mater Studiorum
Università di Bologna

Big Data and Artificial Intelligence

The Passion and the Vision

Emilia-Romagna plays a leading role with a concentration of energy and resources on **computing and digital economy** that makes this territory ready to face the challenges that technology offers.

The Strategy

▪ Create a favorable and smart environment for the development of a digital economy

▪ Create international digital HUB and spoke widespread in the whole region and national territory

➢ Visible at worldwide level for the concentration of HPC infrastructure

➢ Reinforce by the educational and training supply to provide skills for the next generation

➢ Scale up political and administrative decisions to create a governance independent, excellent, effective

➢ Improve the role of LEPIDA, CINECA, INFN, private and public Research laboratories, Universities
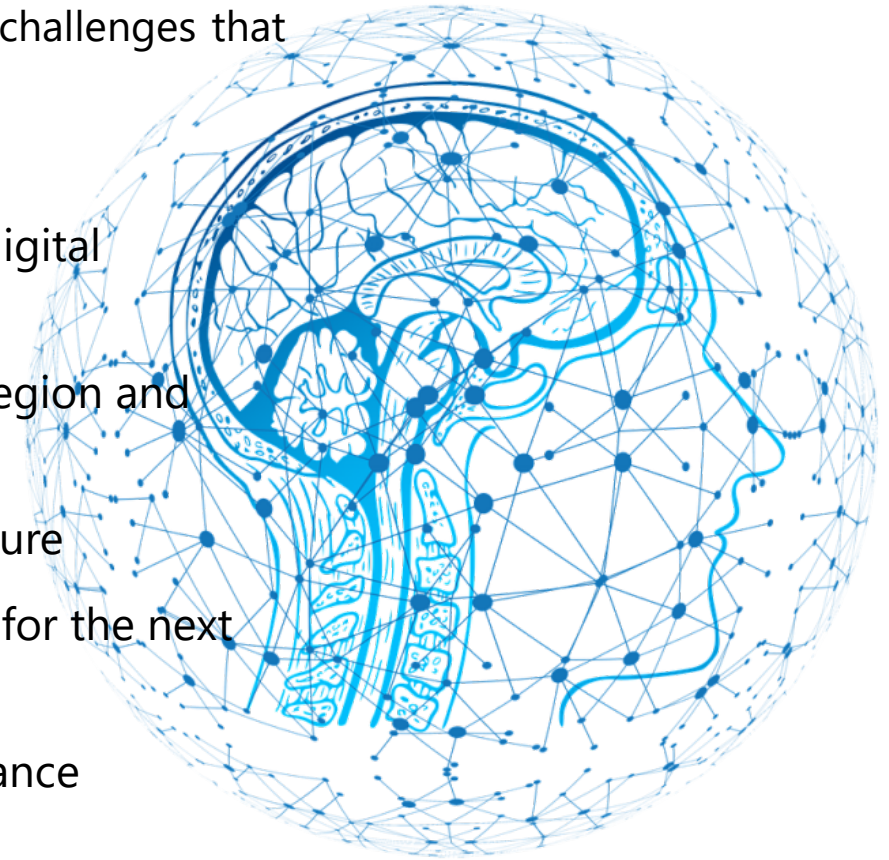
... Strong roadmap and vision for the future: the relevance of CINECA-INFN in Emilia-Romagna

- CINECA is the unique Interuniversity Consortium in Italy and assume the role of National Supercomputing Facility

- INFN CNAF is one of the most important tier1 computing system of the CERN Worldwide LHC Computing Grid in the world

- ECMWF, the European Centre for Medium-Range Weather Forecasts, decided to locate its HPC data center at the Bologna Tecnopolo

- GARR and LEPIDA, after providing a MultiTerabit international connection between the Bologna PoP and CERN, is moving towards network services extreme bandwidth

- In 2021 CINECA will be one of the EuroHPC hosting Entities and will host a next-generation European HPC pre-exascale system in Bologna

- The CINECA - INFN data center of the Bologna Tecnopolo was designed to host the second generation Italian exascale HPC system in 2024/2025

The Bologna Tecnopolo – science park
A European, National and Regional investment for Digital Economy and BD

Regione Emilia-Romagna

Civic Protection and agency for development and innovation

CINECA & INFN Exascale Supercomputing center

ECMWF Data Center

Conference and Education Center

Meteo National Agency

University centers

Biobank and Life Science

Enea center

Competence center Industry 4.0

Big Data Association and Foundation

Innovation center

![Regione Emilia-Romagna]

European, National and Regional investments: key point for international attractiveness

- ECMWF DC   **ECMWF**

ONGOING
- Italia Meteo

CINECA   **INFN** ISTITUTO NAZIONALE DI FISICA NUCLEARE

- CINECA-INFN new data center

- EuroHPC Hosting Entity "Leonardo"   EuroHPC Joint Undertaking

€ 500 millions
- Italian Industry 4.0 Competence Centre (47 entities involved)   **bi-rex** Big Data Innovation & Research Excellence

ONGOING
- EuroHPC National Competence Center for SME

- Centre of Excellence in Material Design   **MAX** DRIVING THE EXASCALE TRANSITION

- HPC Service provision to Eurofusion worldwide community   **EUROfusion**

ONGOING
- AI and computer vision lab at University of Modena & Reggio Emilia (AIRI)

Big Data and Artificial Intelligence: the Education and Training System

✓ **Master's Degree in Artificial Intelligence**, that represents the first example in Italy

✓ **Lessons on big data and artificial intelligence are included in the training offer of all four regional universities**

✓ With reference to the post-graduate offer, **two first level international master's courses in English and two specialization courses in Italian**:

❑ the Digital Technology Management master's degree at the Department of Computer Science and Engineering of the University of Bologna

❑ the master in Data Science activated at the Department of Business Sciences of the University of Bologna

❑ the specialization course on Big Data Analytics offered by the Bologna Business School (BBS);

❑ the specialization course on Methodologies, Techniques and Tools for Big Data Analysis offered by the "Enzo Ferrari" Department of Engineering of the University of Modena and Reggio Emilia.

17/09/19

New investments in R&D and AI in Emilia-Romagna

Regione Emilia-Romagna

Main projects supported by Regional Law n.14 of 2014 on the **promotion of investments in Emilia-Romagna**.

Some figures to summarize the process...

ARTIFICIAL INTELLIGENCE

- Over 8000 papers
- 49 European projects
- 65 Patents

- 6 Universities
- 180 companies
- 31 research centres
- 64 public organizations

BIG DATA

- 690 Papers
- 23 European projects

- 6 Universities
- 31 companies
- 12 research centres
- 19 public organizations

Outcome of an analysis, using the Big Data techniques, to study the activities on Artificial Intelligence and Big Data through participation in European projects, scientific publications and patents.
A perimeter of interest has been defined by keywords.

Challenges for the future

Regione Emilia-Romagna

- European Digital Innovation Hub
- Participation in the construction of HORIZON Europe and other European Initiatives
- Strategic Forum IPCEI (ART-ER) Strategic Value Chain
- New Cohesion Policy 2021 - 2027
- European and International collaborations: **California, Pennsylvania, Gauteng, Guandong, Land Hessen, Nouvelle-Aquitaine, Canada** (Québec and British Columbia)
- Ecosystem networking and attractiveness for Big Data and AI
- New Skills Agenda for Europe
- Participation to Joint Undertaking
- Participation in the European and National Strategy on AI

But the major challenge is to use Big Data and Artificial Intelligence…

… to improve our LIFE!

Thank You,

Morena Diazzi