

“From volume to value” The big data strategy of Emilia-Romagna

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Competences for innovation Unit - ASTER

Workshop on Skills Development for SMEs
on Cybersecurity, IoT and Big Data

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OVERVIEW EMILIA-ROMAGNA

Surface: 22,453 Km²

Inhabitants: 4.45 millions

Population density: 200 inhabitants/sq km

Export: 63 billions

Employment rate: 66.3%

N° Companies: 372.000

GDP per Capita: 34.500 €

R&D – GDP: 2%



5 AREAS OF SPECIALIZATION FOR INNOVATION POLICIES (S3)

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

ABOUT ASTER

- ✓ **ASTER** is the **Consortium** among
 - ✓ the **Emilia-Romagna Regional Government**
 - ✓ the **6 regional Universities**
 - ✓ National Research Centres located in the region (**CNR, ENEA, INFN**)
 - ✓ the **Regional system of Chambers of Commerce**
- ✓ **ASTER** works in collaboration with regional **Business Associations** and **Innovation Centres**

Since 1985 ASTER has shaped and defined **pathways and tools for innovation, industrial research, technology transfer** and for the improvement of **high quality skills** and careers on innovation

Starting point

**Research and competences
in BIG DATA and ARTIFICIAL
INTELLIGENCE are the new
mainstream for policy
innovation**

ELEMENTS OF A DATA-BASED ECO-*

- ✓ Data
- ✓ Structured data
- ✓ Intelligence
- ✓ Network
- ✓ Computer power
- ✓ Components and systems producers (HW and SW)
- ✓ Components and systems integrators and users
- ✓ Market conditions/constraints
- ✓ Institutional frame (laws, rules, supporting policies, ...)
- ✓ Research and education
- ✓ Place-based innovation
- ✓ Enabling conditions (broadband availability, ...)

IN THE PAST

- ✓ Middle 60's:
 - CINECA was established
 - INFN CNAF started operations in Bologna
 - C.N.E.N. (now ENEA) established in Bologna a Computing Center operating an IBM 704, the most powerful scientific computer in Italy at that time
- ✓ 1988: GARR network promoted by CNR, INFN, ENEA, CILEA, CINECA, Tecnopolis CSATA (important node in Bologna)
- ✓ 1994: Iperbole – the first civic network in Italy (COBO, UNIBO, CINECA)
- ✓ 2004: Lepida – the most awarded territorial network for Public Administrations

TODAY

- ✓ CINECA Marconi: 19[°] in the Top 500 HPC
- ✓ INFN CNAF is processing LHC data (Higgs Boson)
- ✓ April 2018 – A link up to 1,2 Terabit per second connects CNAF and CINECA
- ✓ November 2018 – CNAF connected to LHC in Geneve via 200Gbps GARR network

Historically, in Emilia-Romagna there is a sensitivity, an institutional dimension, a concentration of energy, resources and possibilities on **computing and digital economy** that makes this territory ready for the challenges that technology currently offers

THE STRATEGY

- ✓ Enhance existing (research) infrastructures for economic and social purposes
- ✓ Create a favourable environment for the development of a digital economy
- ✓ Be a reference point in terms of infrastructure, skills and institutional level at national and international level

THE FIELDS OF ACTION

- ✓ Infrastructures
- ✓ Skills (Human capital and SMEs)
- ✓ Strategic plans
- ✓ Governance

INFRASTRUCTURES

✓ Big Data Technopole

- European, National and Regional investments (≈ 350 M€), key point for international attractiveness
- ECMWF DC
- CINECA-INFN HPC pre-exascale hosting candidate
- Industry 4.0 and Meteo labs

✓ AI and computer vision lab UNIMORE

- Regional investment

BIG DATA TECHNOPOLE – BOLOGNA HUB



A European, National and Regional investment for Digital Economy and BD

SKILLS (human capital)

- ✓ Education (Master: AI, Digital Technology Management, Data Science; Big Data Analytics)
- ✓ PhD Courses
 - 22 doctorates in Data Science
 - 12 doctorates in BD and AI
- ✓ Research fellowship
 - 16 approved + 32 presented (evaluation ongoing)
- ✓ Big Data Lab: training entry level on BD for 750 just-graduates (financed by European Social Fund)
- ✓ Agreements with Piano Nazionale Scuola Digitale to promote BD in schools

SKILLS (SMEs)

- ✓ Survey to 39 regional SMEs and 4 Universities to get an insight of the state of art, some highlights:
 - Main obstacle: weak data culture
 - Shortage of qualified human resources
 - Vast majority are very “small” SMEs not structured for the use of Big Data, possible support offered by the Emilia-Romagna Big Data Community

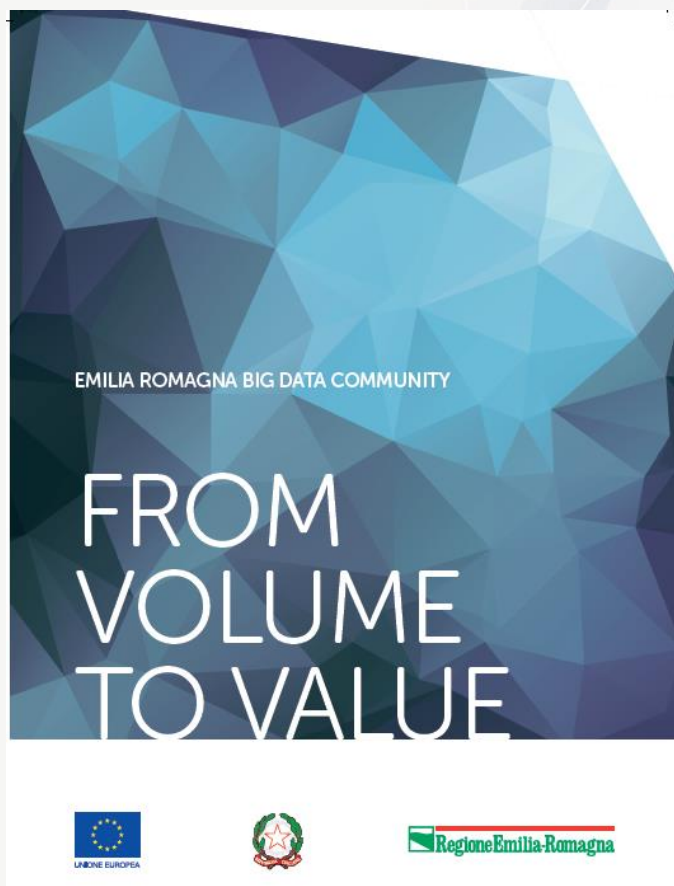
Strategic plans

- ✓ Law for attractiveness
- ✓ Regional programme for research and innovation infrastructures
- ✓ Regional law for investment in Big Data, Artificial Intelligence, Meteorology and Climate Change – ongoing
- ✓ Strategic partnerships at national and international level

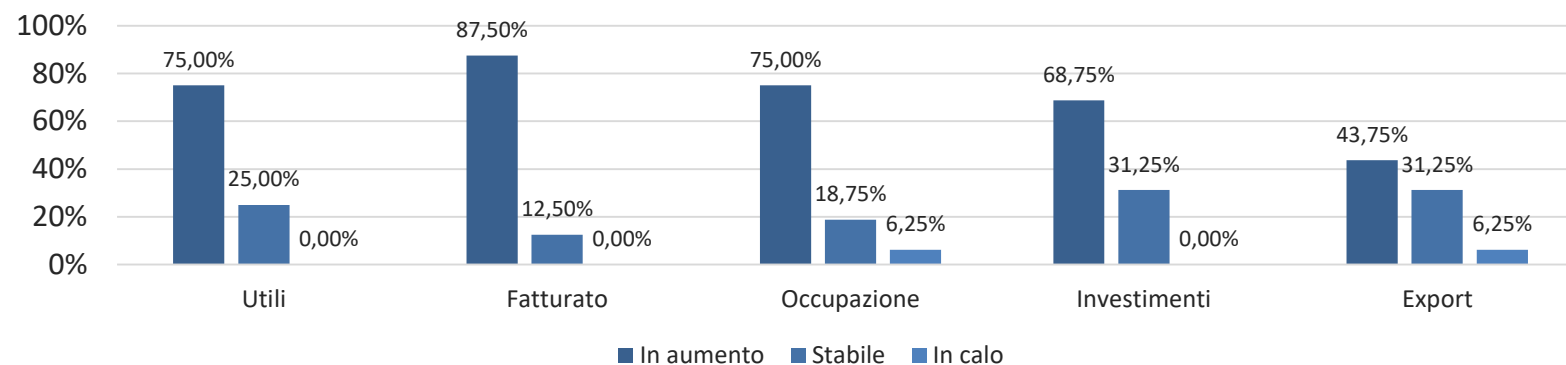
BIG DATA COMMUNITY & NETWORK

- ✓ From Volume to Value
- ✓ Big Data Association
- ✓ BI-REX
- ✓ Digital Innovation Hubs
- ✓ IPCEI (Strategic value chain Industrial Internet of Things)

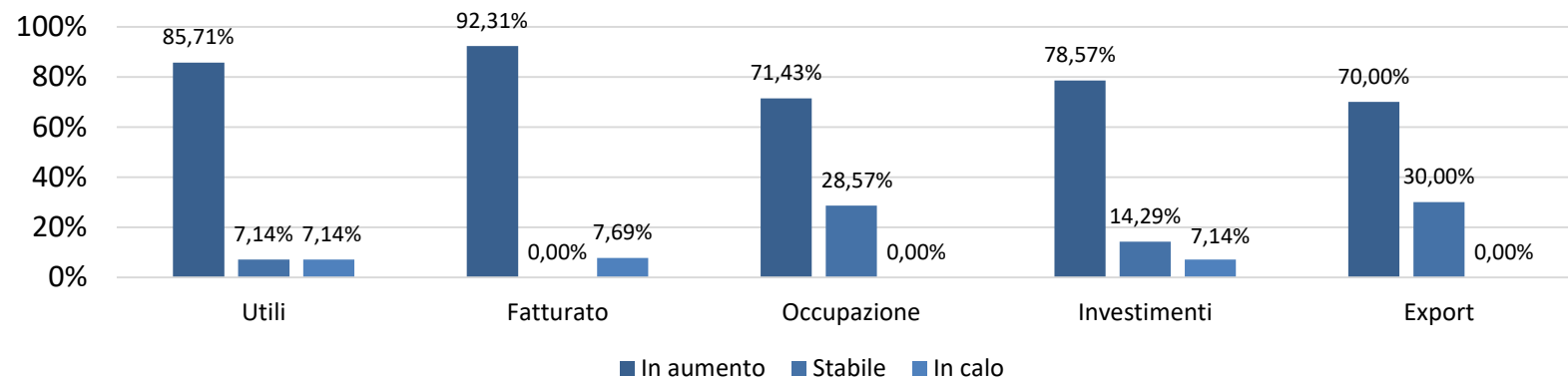
From volume to value



Performance imprese ICT



Performance imprese Produzione/servizi



GOVERNANCE – AWARENESS – BD&AI INNOVATION ACTIVITIES

✓ Artificial Intelligence

- Over 8000 papers
- 54 European projects
- 60 Patents

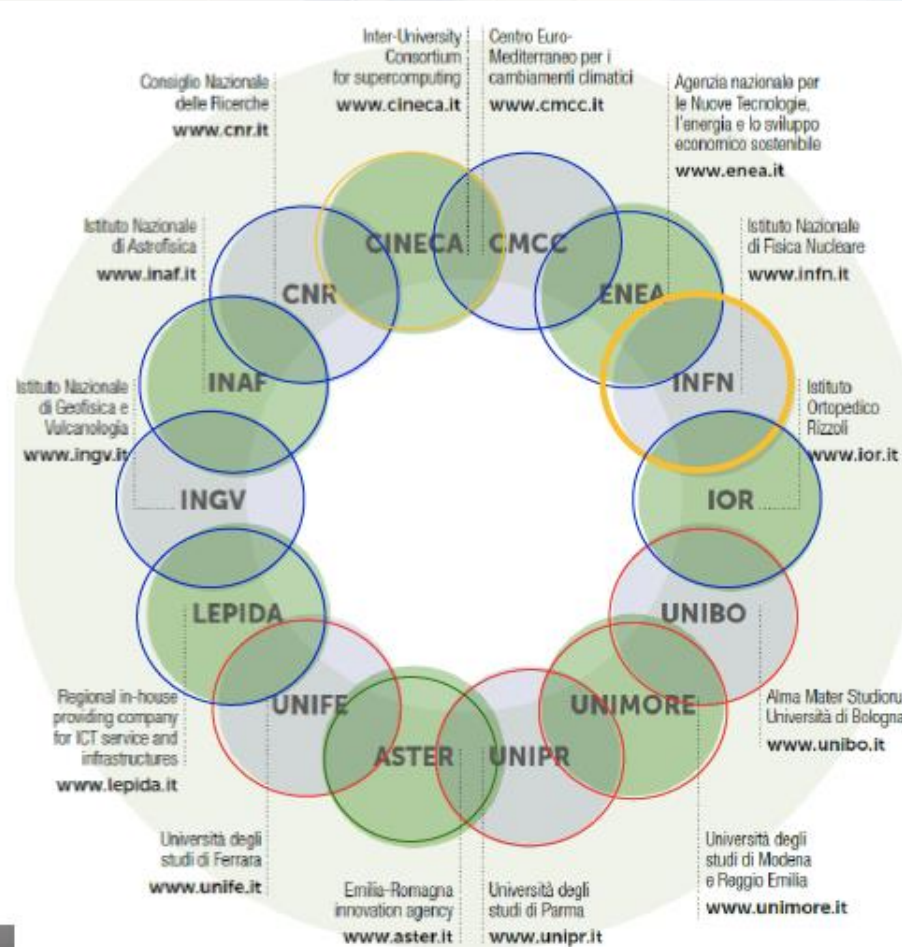
- 6 Universities
- 180 companies
- 27 research centres
- 65 public organizations

✓ Big Data

- 690 Papers
- 23 European projects

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

BIG DATA ASSOCIATION



CONNECTIVITY
LEPIDA, GARR

INFRASTRUCTURES
HW

CINECA, INFN, LEPIDA,

SW

CINECA, INFN, UNIMORE,
UNIBO, UNIFE, INAF, CNR,
ENEA

END USERS

UNIMORE, CINECA, INFN,
UNIBO, UNIFE, INAF, CNR, IOR,
UNIPR, LEPIDA, ENEA, CMCC,
INGV



BI-REX

- ✓ Big data Innovation-Research Excellence funded by National Impresa 4.0 Plan (€ 7,5 M in cash contribution - € 7,2 M in kind contribution)
 - 5 Universities
 - 2 National research centres
 - 5 Stakeholders
 - 31 Companies - end users
 - 23 Companies – tech providers

BI-REX

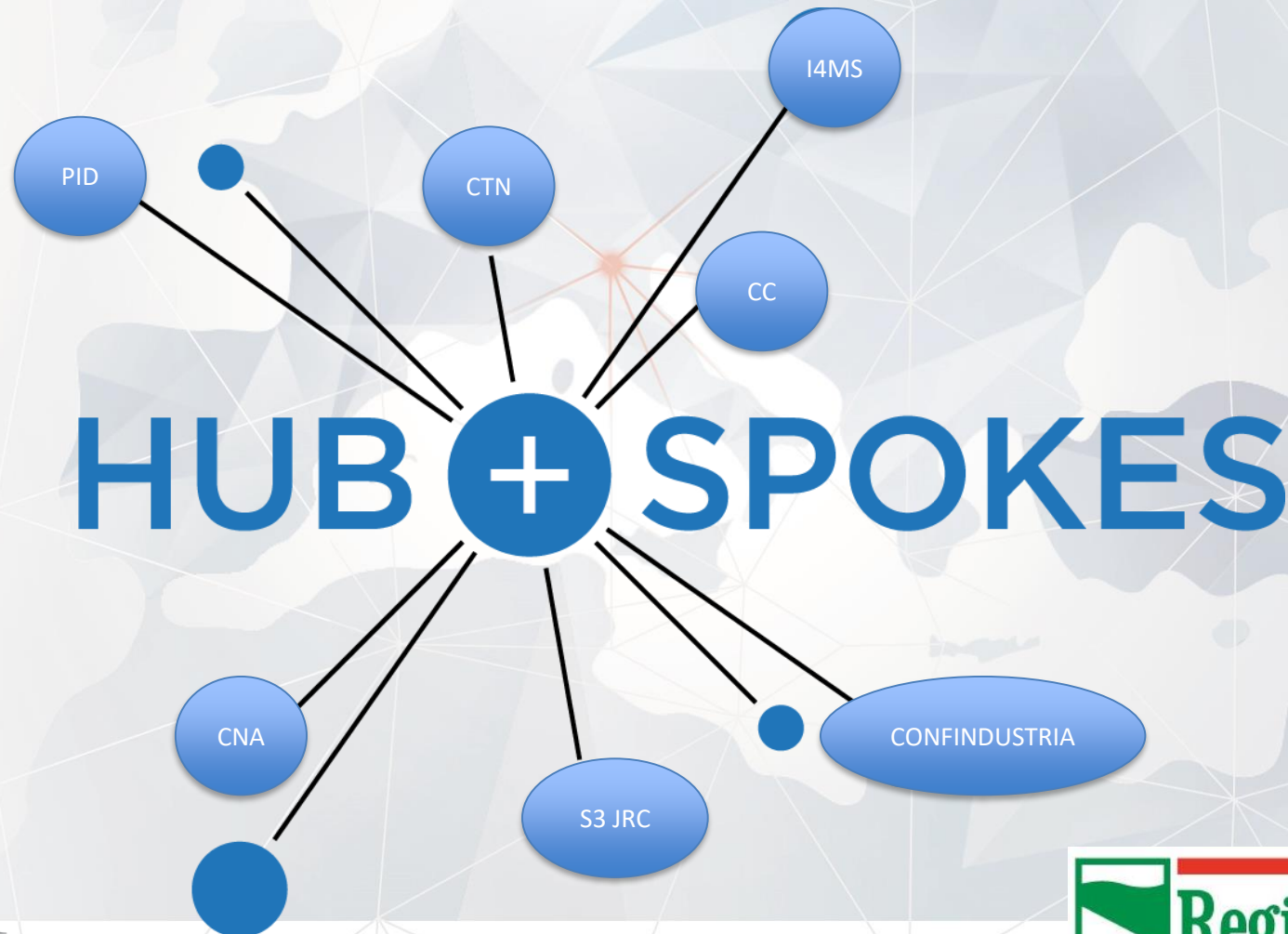
A **public-private center** assisting SMEs in adopting Industry 4.0 enabling technologies through technology advisory and assessment, design and validation of innovative solutions, and training.

It will gather the know-how of the Emilia Romagna Network of High Technology to **develop solutions for SMEs at high TRL**, near to the market, in particular in the following industrial sectors: Mechatronics and Automotive, Biomedicine, Agri-Food, Energy and Environment , Logistics, Services and Financing

ASTER as Digital Innovation Hub

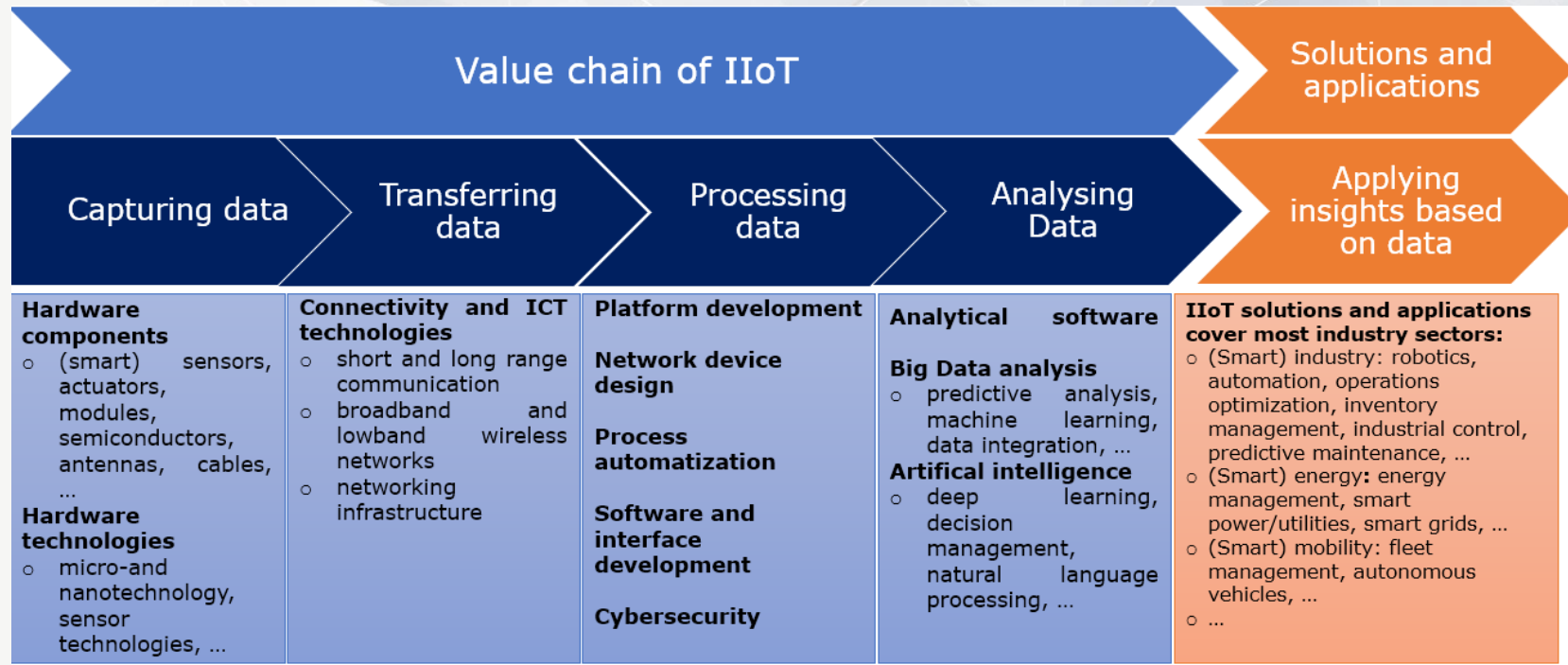
High
Technology
Network

Pilot Project:
Data Scientist
for SMEs



GOVERNANCE – IPCEI SVC

Strategic Value Chain – IIoT – Industrial Internet of Things (ongoing)





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