Regional skills intelligence observatories in Italy – the case of Emilia-Romagna

Gabriele Marzano
Policy Manager –Emilia-Romagna Regional Government
Torino, 25 June 2025

ETF Working together Learning for life
European Training Foundation

Regional Cooperation Council

Funded by the European Union

General Objective of the Seminar:

- **showcasing different use cases of ESCO** on job-matching, labour market analysis and education and training topics;
- **facilitating the sharing of experiences** among stakeholders and fostering engaging discussions about the requirements for using ESCO in the participating countries.

Main critical steps of the presentation:

1. **Institutional context** - VET Policies and Active Employment Policies in Italy;
2. The **«Taxonomy» Conundrum**;
3. **The case of Emilia-Romagna** and its Innovation and Research Ecosystem;
4. **Clust-ER Associations** and their role in skills «language» and «translation»;
5. ESCO use in «vertical» analysis in specific sectors (i.e. **Big Data, Textile**, etc.);
6. ESCO use in **Skills Intelligence** on on-line vacancies;
7. The importance of **«institutional architectures»** for skills intelligence systems.

The institutional framework of Italian Regions

- In Italy, regional governments enjoy **constitutional autonomy:** <u>total</u> in specific sectors (e.g. employment and VET policies); <u>partial</u> in others (e.g. education policies);
- State can issue **general provisions** but Regions **regulate, plan and implement active policies** in these sectors.
- **Funds for Skills and Employment Policies** (such as ESF+) are mainly managed by Regional Governments;
- **Analysis of LMs and Forecasting of Skills demand** is provided by multiple actors (i.e. **ISTAT** national Trimestral Survey on Labor Forces; **UnionCamere** on national firms' job forecasting; local and/or **regional surveys** through administrative and statistical data.

The "taxonomy conundrum"

What a "saldatore specializzato" (welder) does?

«L'Addetto qualificato saldatore opera nel settore metalmeccanico, esegue correttamente le operazioni di saldatura utilizzando macchine saldatrici o utensili. L'addetto si occupa della preparazione della sagoma e del taglio dei pezzi da saldare rispettando i dati tecnici e i disegni forniti dal reparto progettazione……»

https://www.inapp.gov.it/atlantelavoro/repertorio-nazionale-qualificazioni/profilo/?id_profilo=13795

«La definizione delle competenze di saldatore specializzato nel Sistema Regionale delle Qualifiche (SRQ) Emilia-Romagna si articola in capacità, conoscenze e risultati attesi specifici per la figura professionale, che includono:
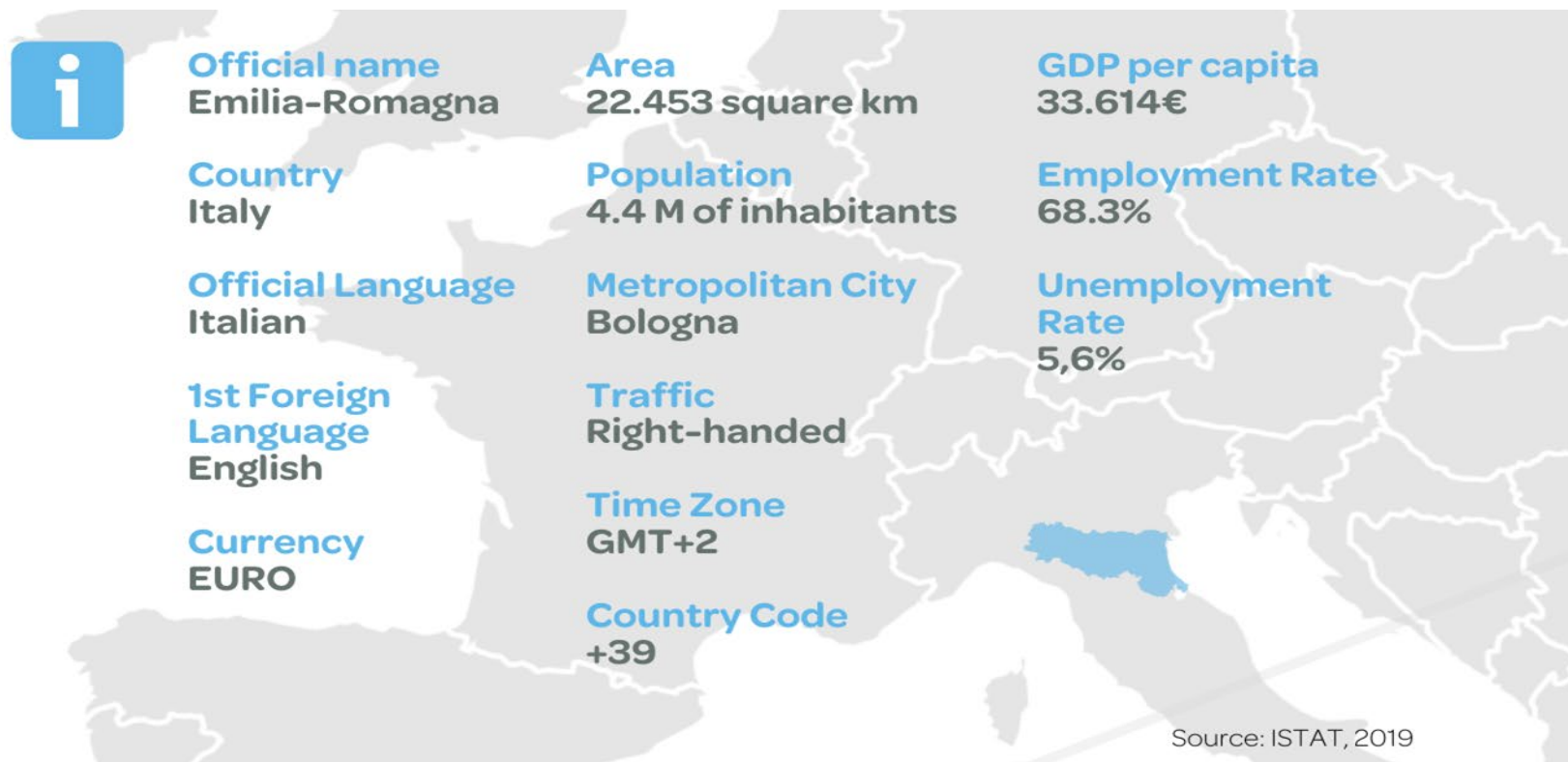
Risultati attesi principali: Componenti saldate e rifinite in conformità alle specifiche tecniche e agli standard di sicurezza; Pezzo realizzato rispondente agli standard di qualità previsti.

Capacità: Adottare tecniche per il posizionamento dei componenti e per la puntatura in preparazione delle operazioni di saldatura……….»

https://orienter.regione.emilia-romagna.it/qualifica/dettaglio/419

«Il saldatore unisce due o più pezzi di metallo utilizzando calore e metalli fusi, producendo una giunzione permanente. Da questa definizione, si comprende da subito che il saldatore deve avere alcune conoscenze tecniche in merito all'utilizzo dei metalli e delle tecniche di saldatura. Inoltre, deve conoscere le norme di sicurezza per tutelare la sua persona e gli altri, poiché è un lavoro rischioso e coinvolge materiali ad alta temperatura….»

https://it.indeed.com/guida-alla-carriera/trovare-lavoro/saldatore-cosa-fa

RegioneEmilia-Romagna

EMILIA-ROMAGNA SKILLS ECOSYSTEM

Official name Emilia-Romagna	**Area** 22.453 square km	**GDP per capita** 33.614€
Country Italy	**Population** 4.4 M of inhabitants	**Employment Rate** 68.3%
Official Language Italian	**Metropolitan City** Bologna	**Unemployment Rate** 5,6%
1st Foreign Language English	**Traffic** Right-handed	
Currency EURO	**Time Zone** GMT+2	
	Country Code +39	

Source: ISTAT, 2019

Some description about Emilia-Romagna context

ETF Working together Learning for life
European Training Foundation

Regional Cooperation Council

Funded by the European Union

Regione Emilia-Romagna

ETF-RCC event
"*Enhancing labour mobility for EU enlargement economies: the role of ESCO*"
24-25 June 2025, Turin (Italy)

A New Ecosystem for Regional Development, Innovation and Research....

Regional University System

- 7 Universities
  - 400 courses (Three-year and magistral degrees)
  - 153 master
  - 126 Specialization Courses
  - **160 k 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 ITS Foundations with 26 courses

Università di Bologna

Università di Modena e Reggio Emilia

Università di Ferrara

Università di Parma

Università di Cattolica

Politecnico di Milano (Piacenza)

Università John Hopkins

4 Large Research Infrastructure

Big Data Technopole, INAF Radio Telescopes, ENEA Brasimone, CICLOPE

7 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)

2 International Authorities/Agencies

European Food Safety Authority, European Centre for Medium-Range Weather Forecasts

ETF Working together Learning for life
European Training Foundation

... that needs a common language on skills intelligence and forecasting

Regional Cooperation Council

Funded by the European Union

RegioneEmilia-Romagna

The S3 Clust-ER Associations: their importance on skills description and... translation

11 Clust-ER associations are legally established **communities** of **700+** public and private bodies (research centers, companies, training bodies, universities and other public administrations) created to support the competitiveness of the most important production systems (32 Value Chains) in Emilia-Romagna **based on Regional Smart Specialisation Strategy**.

Esco system use in sectoral analyses: the case of Big-Data and AI jobs in Emilia-Romagna

Objectives of the reseach

- to identify the **professional skills** for big data management sector;
- to perform a **skill gap analysis** to identify the necessary profiles;
- to define the paths of **technical-specialist training;**
- to operate with the **network of regional actors** for the development of big data and AI up-to-dated VET provision.
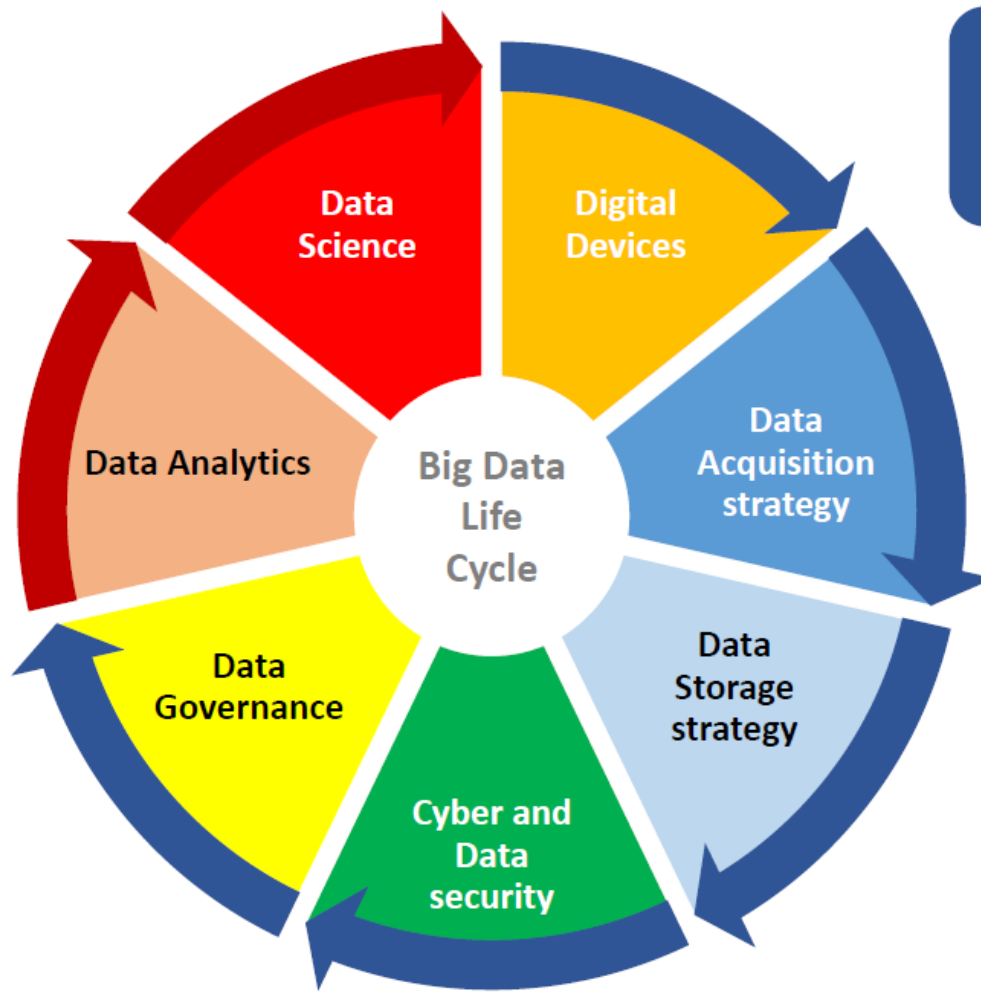
Activities

- analysis of the Big Data management **process** and description of the necessary profiles (phase 1)
- analysis of the **demand** for professional profiles and skills for the use of big data (phase 2)
- identification of the **needs** and expectations of the production system for the development of big data (phase 3)
- identification of **training courses** for the acquisition and exercise of skills in the production chains (phase 4)
- development of the **partnership model** for the continuous enhancement of big data skills

Esco system in sectoral analyses: the case of Big-Data and AI jobs

Big Data Life Cycle

Big Data Analytics

○ *Data modelling and predictive analytics*

○ *Data science (artificial intelligence, machine learning, high performance computing)*

Big Data Management

○ *Digital devices*

○ *Data acquisition strategy*

○ *Data storage strategy*

○ *Cyber and data security*

○ *Data governance*

Funded by the European Union

Esco system in sectoral analyses: the case of Big-Data and AI jobs

Of the 33 professions mapped in ESCO we have:

- ➢ Description of the profession
- ➢ *Knowledge* that is both essential and optional
- ➢ *Skills/Competencies* that are essential and optional

Connections

- ➢ *Connection to the ISTAT CPI*
- ➢ *Hirings* for ISTAT CPI (source: *CO*)
- ➢ Geolocation of the hiring *companies* (source: *CO*)

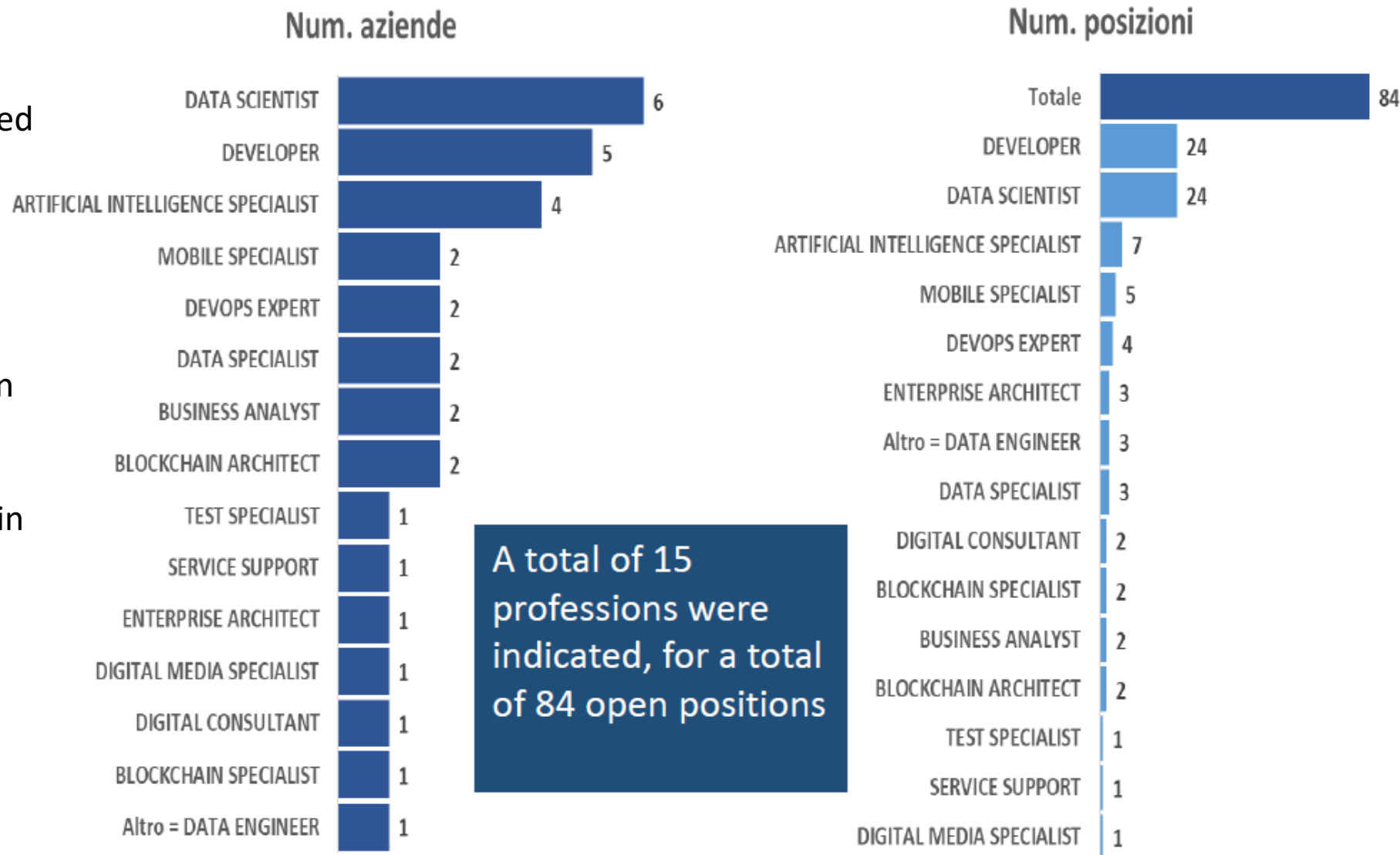# Esco system in sectoral analyses: the case of Big-Data and AI jobs

BIG DATA PROFESSIONS	Professors Weight	BIG DATA PROFESSIONS	Professors Weight
DATA SCIENTIST	2.00	NETWORK SPECIALIST	0.75
DATA SPECIALIST	2.00	DIGITAL CONSULTANT	0.50
ARTIFICIAL INTELLIGENCE SPECIALIST	1.75	MOBILE SPECIALIST	0.50
DATABASE ADMINISTRATOR	1.75	BLOCKCHAIN ARCHITECT	0.50
PREDICTIVE MAINTENANCE EXPERT	1.75	SYSTEMS ADMINISTRATOR	0.50
BUSINESS INFORMATION MANAGER	1.25	DIGITAL MEDIA SPECIALIST	0.25
INFORMATION SECURITY MANAGER	1.25	SERVICE SUPPORT	0.25
DEVELOPER	1.00	BLOCKCHAIN SPECIALIST	0.25
BUSINESS ANALYST	1.00	SYSTEMS ANALYST	0.25
SYSTEMS ARCHITECT	1.00	TEST SPECIALIST	0.25
INFORMATION SECURITY SPECIALIST	1.00	PRODUCT OWNER	0.25
DEVOPS EXPERT	0.75	QUALITY ASSURANCE MANAGER	0.25
ENTERPRISE ARCHITECT	0.75		

Through the preparation of dedicated survey forms, a number of university professors in the Focus Group (and who made themselves available) were asked to select, from the list of 33 profiles mapped in ESCO, those most relevant to the development of Big Data in the production sector by attributing a «weight». Furthermore, for each profile identified, it was requested to indicate the essential and optional skills and knowledge deemed relevant.

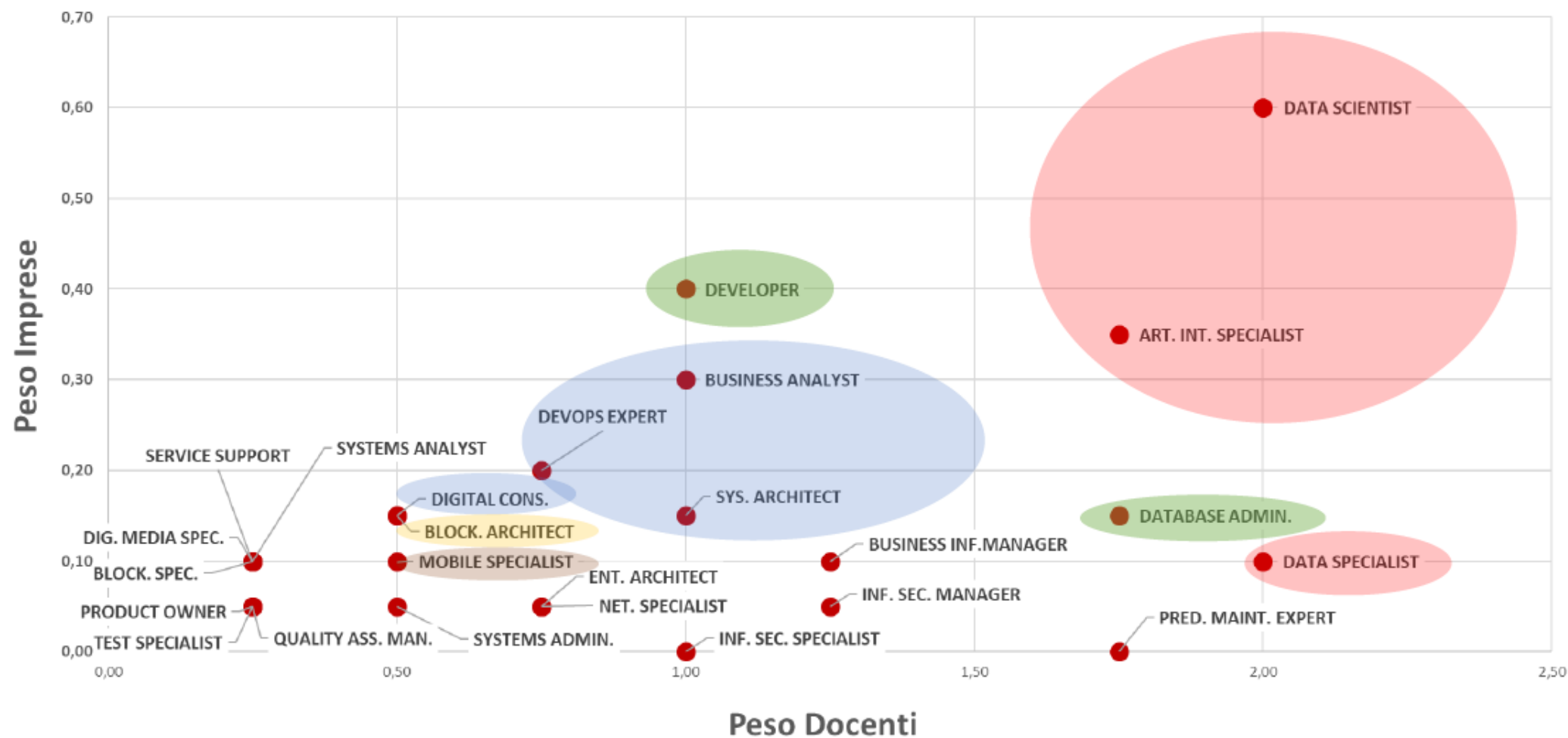# Esco system in sectoral analyses: the case of Big-Data and AI jobs

The 25 Big Data professions identified through the professors' panel, together with the 258 skills, are proposed in a survey aimed at companies identified by the Emilia-Romagna Region.

Out of 26 companies participating in the field survey, 20 completed the questionnaire and, of these 20, 15 declared that they were interested in hiring Big Data professionals.
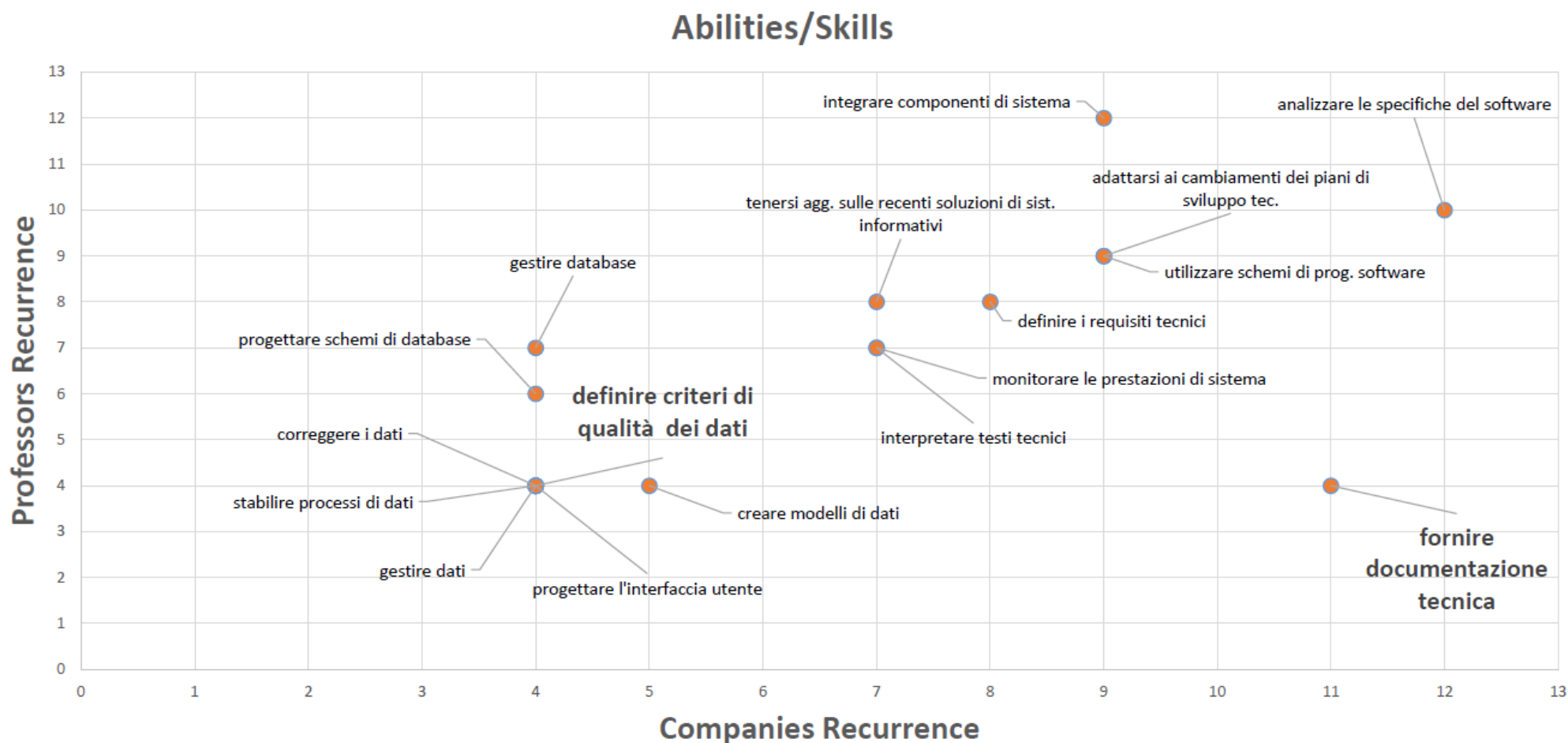
Num. aziende

Profession	Value
DATA SCIENTIST	6
DEVELOPER	5
ARTIFICIAL INTELLIGENCE SPECIALIST	4
MOBILE SPECIALIST	2
DEVOPS EXPERT	2
DATA SPECIALIST	2
BUSINESS ANALYST	2
BLOCKCHAIN ARCHITECT	2
TEST SPECIALIST	1
SERVICE SUPPORT	1
ENTERPRISE ARCHITECT	1
DIGITAL MEDIA SPECIALIST	1
DIGITAL CONSULTANT	1
BLOCKCHAIN SPECIALIST	1
Altro = DATA ENGINEER	1

A total of 15 professions were indicated, for a total of 84 open positions

Num. posizioni

Profession	Value
Totale	84
DEVELOPER	24
DATA SCIENTIST	24
ARTIFICIAL INTELLIGENCE SPECIALIST	7
MOBILE SPECIALIST	5
DEVOPS EXPERT	4
ENTERPRISE ARCHITECT	3
Altro = DATA ENGINEER	3
DATA SPECIALIST	3
DIGITAL CONSULTANT	2
BLOCKCHAIN SPECIALIST	2
BUSINESS ANALYST	2
BLOCKCHAIN ARCHITECT	2
TEST SPECIALIST	1
SERVICE SUPPORT	1
DIGITAL MEDIA SPECIALIST	1

European Training Foundation
Working together Learning for life

Esco system in sectoral analyses: the case of Big-Data and AI jobs

Professions Big Data Life Cycle: representation of professional profiles with respect to the weight attributed by Teachers and Companies (requirement and workforce)

Esco system in sectoral analyses: the case of Big-Data and AI jobs

Key Skills: the 17 Abilities/Skills

Abilities/Skills

Esco system in sectoral analyses: the case of Big-Data and AI jobs

The results of the first three phases of the program suggest the need to focus on four areas of intervention:

➢ **The development of a series of literacy paths in the *Big Data* cycle**, differentiated by education and training level (i.e. divided, for example, by ITS upper secondary education institutes, degree courses, etc.).

➢ **The review of a number of professional profiles** already existing in the context of *regional professional training* that could cover the needs of companies for certain key profiles involved in the development of *Big Data*.

➢ **The identification of a set of knowledge/key skills** functional to integrate the curricula of certain ITS courses *already present in the regional context*, progressively directing them towards the key professional profiles in the *Big Data* life cycle.

➢ **The creation of *regional laboratories on Big Data*,** closely linked to companies, with the participation of the main training agencies (FP, ITS and Universities), created through a *public-private partnership* **capable of proposing educational paths that are highly oriented towards "know-how"**, certifying not only the "skills" acquired but also the "experience" gained in operational contexts.

Council

Esco system in sectoral analyses: the case of Fashion sector

Objectives

- Conducting a in-depth analysis through a system of contextual data analysis and accurate profiling and skills assessment, combining:
  - *skill intelligence* tools through the application of the **European Skills Classification (ESCO)**, the INAPP *Atlas of Jobs and Qualifications* as well as qualitative analysis
  - **semi-structured interviews** and **sectoral focus groups** – aimed at supporting the data collected by involving actors and stakeholders in the sector under investigation.

Esco system in sectoral analyses: the case of Fashion sector

A list of 58 professions in the Fashion System consists of 5 high-skill professional units and 53 medium-skill professional units. This cluster has also been integrated with the information contained in the European Commission's ESCO classification. By setting up a special crosswalk, it has been possible to map 45 of the 58 professional units to the above classification.

58
Professioni

→ **13** Professioni non riconducibili alla classificazione ESCO

→ **2** Professioni non riconducibili all'Atlante del Lavoro e delle Qualificazioni

45 → **1.098**
Professioni ricondotte a ESCO   Skills

- ➤ 257 Conoscenze (18 Green)
- ➤ 841 Abilità/Competenze (21 Green)

56 → **112**
Professioni ricondotte all'Atlante del Lavoro   ADA

- ➤ 80 SEP 'Tessile, abbigliamento, calzaturiero e sistema moda'
- ➤ 10 SEP 'Meccanica, produzione e manutenzione di macchine, impiantistica'

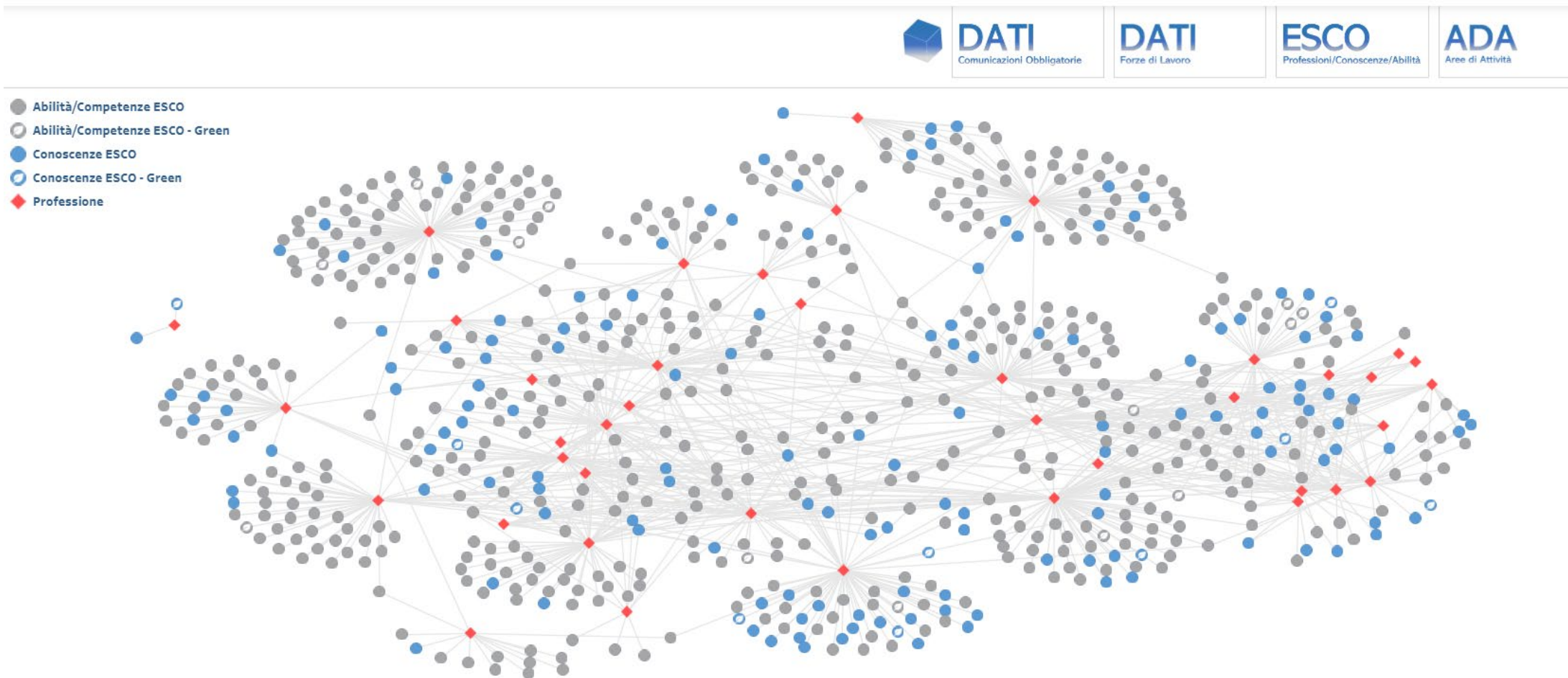***Esco system in sectoral analyses: the case of Fashion sector***

Research path:

1. analysis of administrative *mandatory communications* on "*2021-first half of 2022*" **job hirings** in fashion sector in Emilia-Romagna.

2. Job Profiles and associated skills analysed using **ESCO** – the European Commission's Classification System – and **INAPP**'s Atlas of Jobs and Qualifications, and configured in an online dashboard.

3. The Dashboard is a business intelligence tool with qualitative and quantitative analysis data collected and made available for browsing and consultation. The tool can be accessed at the following address :

    https://public.tableau.com/app/profile/anpalservizi/viz/SISTEMAMODA-RegioneEmiliaRomagna/HOME?publish=yes

Esco system in sectoral analyses: the case of Fashion sector

A network analysis based on proximity level btw job profiles

*The **regional Skills Intelligence System**: an application of job and skills forecasting through technological development and interistitutional cooperation*

An open, interactive digital tool that shows data on skills and profiles, on:
__Job demand__, using data from OJV - online job vacancies offered in Emilia-Romagna (Lightcast);
__Job hirings__, using administrative data extracted from contracts (regional employment agency);
__Job expected__, using data extracted from the official survey on skills needs (Excelsior Information System)

HOME | ASSUNZIONI | ANNUNCI | FABBISOGNI

MISMATCH
SKILLS INTELLIGENCE
FORECAST | COMPETENZE

SKILLS INTELLIGENCE EMILIA-ROMAGNA
LE COMPETENZE E I PROFILI PROFESSIONALI RICERCATI DALLE IMPRESE

https://emiliaromagnainnodata.art-er.it/skills-intelligence-emilia-romagna/

ETF
Working together
Learning for life
European Training Foundation

Regional Cooperation Council

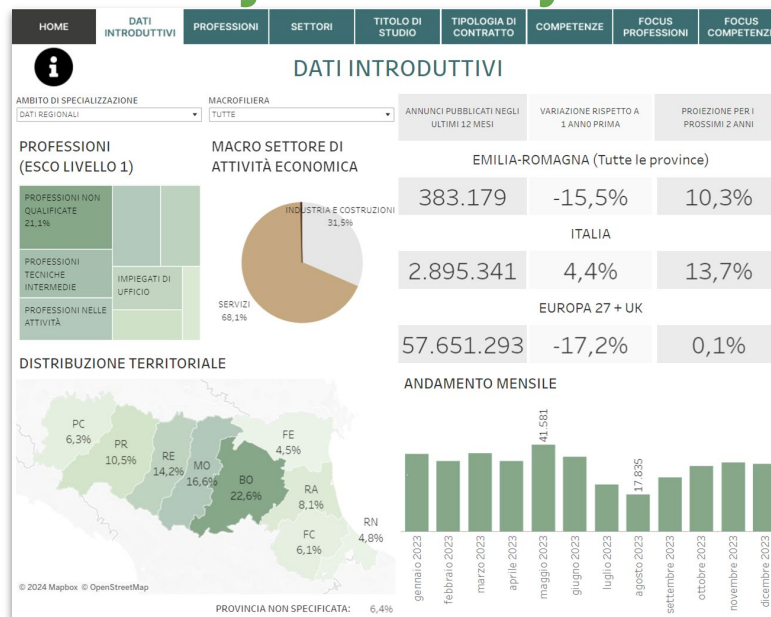Funded by the European Union

The **regional Skills Intelligence System**: a multi-level informative digital platform

#contracts

#onlinejobvacancy

#survey

21

The **regional Skills Intelligence System**: a multi-level informative digital platform

	CONTRACTS	ONLINE JOB VACANCIES	SURVEY
OCCUPATIONS	ISTAT CP2011 - National Taxonomy (up to level 3)	ESCO/ISCO (up to level 6, if possible)	ISTAT CP2011 - National Taxonomy (up to level 4)
SKILLS	-	ESCO & Occupations: ISCO - International Standard Classification of Occupations (using a hierarchy based on the O*NET classification)	not present at the moment
EDUCATION LEVEL	-	ISCED 2011 - International Standard Classification of Education	not present at the moment
ECONOMIC SECTORS	ATECO (detail of 6 Ateco digits)	ATECO (detail of 2 Ateco digits)	aggregation of ATECO codes
REPRESENTATIVENESS	Private and public sector Only employee contract	Only private sectors Employee and freelance contracts	Only private sectors Only employee contract

The regional Skills Intelligence System: The S3 yearly Focus groups on Skills and Jobs Forecasting

Every year, **a social event is to be held in Bologna, featuring 10 focus groups** aimed at discussing key trends emerging by the Skills Intelligence Emilia-Romagna Project. **Focus groups are organised according to 10 S3 specialization areas** and are aimed at discussing demand and supply of highly specialized skills, identifying the specific skills needs of companies and gathering proposals for regional and local public VET and educational systems. **In 2024 the event saw the participation of 143 attendees,** including members from **regional Clust-ERs, representatives from educational and training institutions, universities, companies, associations, employment services, and public administrations**.

The participation of diverse stakeholders facilitated a comprehensive **exploration of labor market trends and educational needs, aligning skill development with regional innovation strategies** to optimize resources and maximize the effectiveness of proposed regional actions. The collaborative approach adopted during the focus groups provides a **solid foundation for developing effective responses to the evolving challenges of the labor market in Emilia-Romagna.**

Thank you for your attention!

Gabriele Marzano
Regional Administration of Emilia-Romagna
gabriele.marzano@regione.emilia-romagna.it

For further information and updates see also:

- https://formazionelavoro.regione.emilia-romagna.it/piani-programmi-progetti/pon-spao/professioni-e-competenze-per-la-big-data-valley
- https://formazionelavoro.regione.emilia-romagna.it/piani-programmi-progetti/pon-spao/competenze-per-la-transizione-green-in-emilia-romagna
- https://www.sviluppolavoroitalia.it/it/-/sistema-moda-emilia-romagna
- https://emiliaromagnainnodata.art-er.it/skills-intelligence-emilia-romagna/