

BIG DATA

**LABOUR MARKET
INTELLIGENCE**

Eduarda Castel-Branco
Opening session, 8 June 2021



European Training Foundation

WELCOME

- To the Training Programme on **Big Data for Labour Market and Skills Intelligence**
- Participants from Africa, Europe and Middle East
- Intensive journey: 5h x 3 days
- Knowledge and discovery-rich
- Presentations x discussion x questions and answers x hands-exercices
- 2 case studies
- Team: Alessandro, Mauro, Eduarda, Alina
- Thanks to interpreters' team and team Pomilio

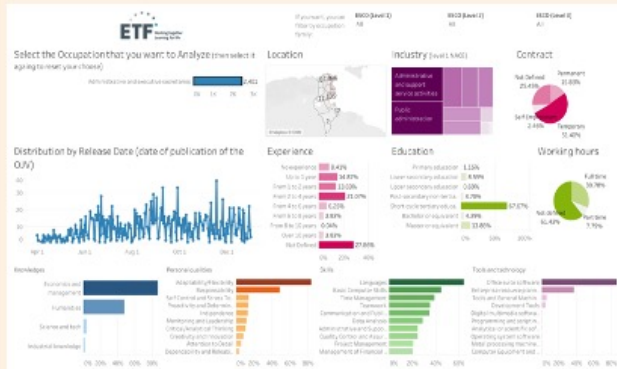


Big Data for Labour Market Intelligence: Online job vacancy analysis (OJV)

Virtual training programme

Full programme: 8, 10 and 15 June 2021

Multilingual: English-French-Russian



ETF working with Burning Glass Europe



Agenda:

Day 1: 08/06/2021, 09.00-14.30 CET (GMT+2)

- LMI – based on Webdata: from online job vacancies to data and analysis of skills, occupations, sectors. Architecure, data ingestion techniques, data processing pipeline, classification techniques.
- Case study: Smart Statistics - Eurostat

Day 2: 10/06/2021, 09.00-14.30 CET (GMT+2)

- LMI – based on Webdata: Focus on building a data pipeline
- Case study: Big Data – career progression

Day 3: 15/06/2021, 09.00-14.15 CET (GMT+2)

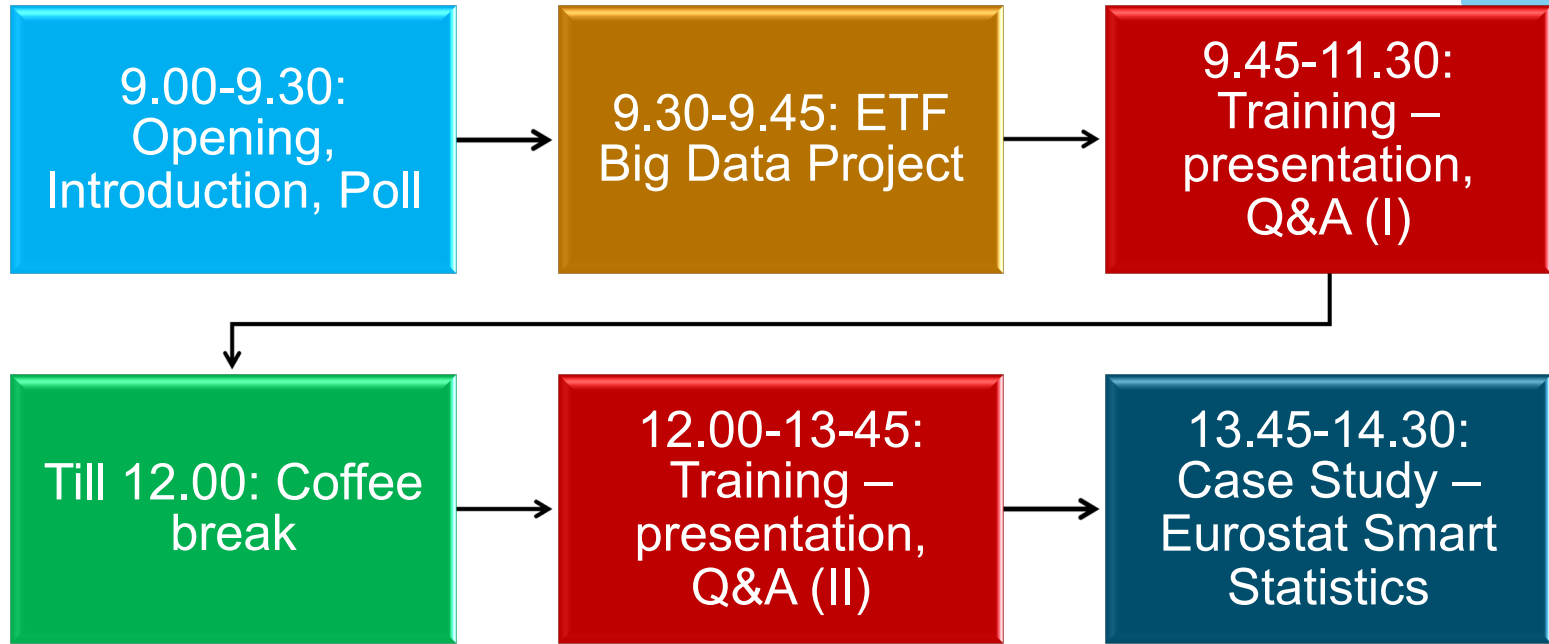
- LMI – based on Webdata: Presentation area, use cases, hands-on exercises and lessons learned

THE 3-DAY JOURNEY HELPS US DISCOVER...

- What is Big Data analytics for Labour Market Information Systems?
- How to explore and create value from large volumes of Online Job Vacancies for real-time LMIS?
- Which dimensions and issues related to skills, occupations, and labour market dynamics questions can be analysed with help of Big Data / Real-time LMI?
- Which are the requirements to harness these novel data sources and systems by ETF Partner countries?
- How can Real-time LMI based on Big Data and AI-aided classification be used and complement established national statistics?



AGENDA DAY 1: 8 JUNE



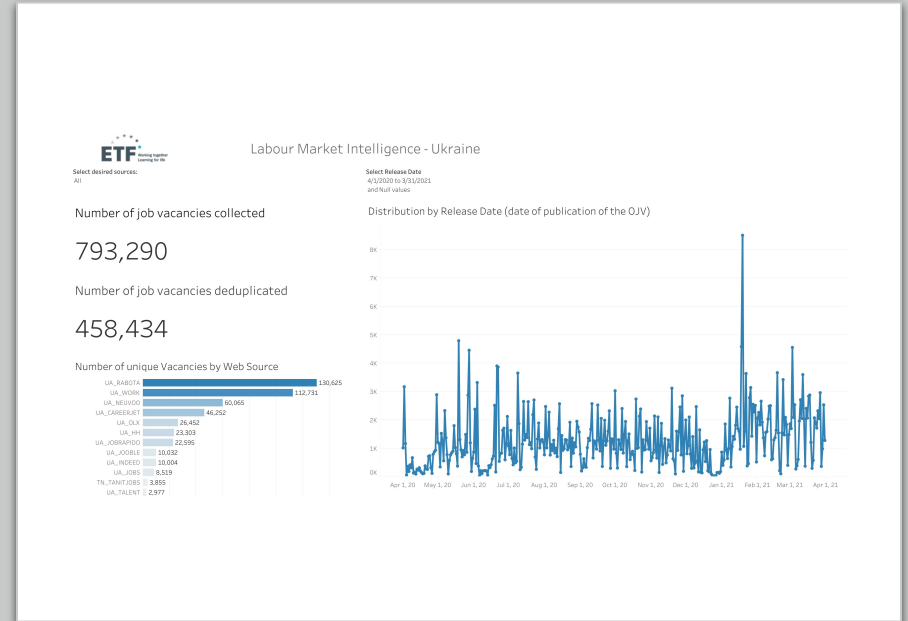
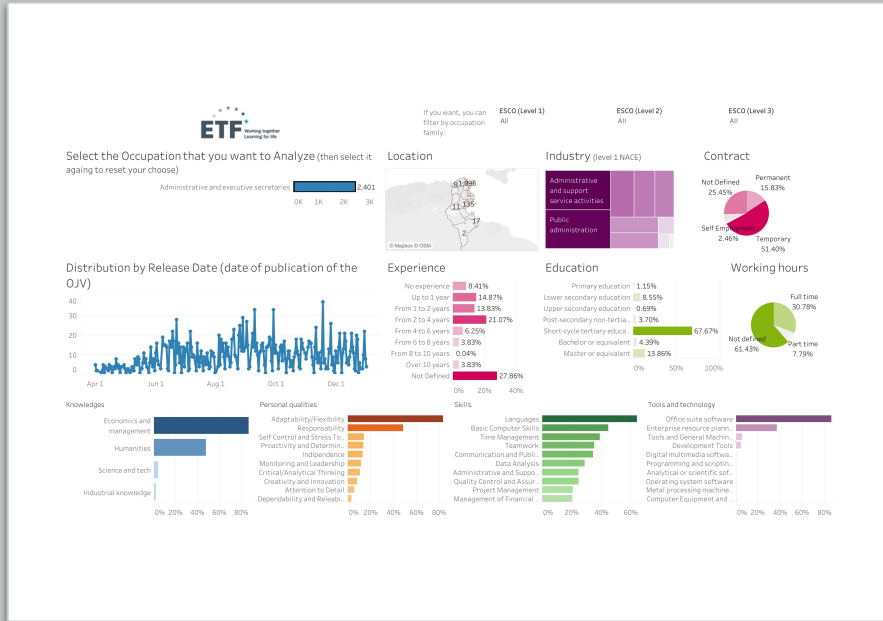
GETTING ACQUAINTED...

USING A POLL



ETF PROJECT BIG DATA FOR LMI

- Data ingested: up 31/03/2021
- Update: up 31/05/2021



WORK, TASKS, JOBS AND SKILLS ARE IN TRANSFORMATION

Social media manager, Airbnb host, influencer, SEO specialist, app developer, Uber driver, driverless car engineer, podcast producer and drone operator...

- These are just some of the jobs that did not exist 10 years ago.
- What will happen in the future? What kind of jobs will disappear, what will be created and why?
- Which new skills will be essential in the job market?
- How much is digitalisation and greening changing our occupations, tasks, skills?

THE CHANGING NATURE OF WORK

AND SKILLS IN THE DIGITAL AGE





Data Torrent



AI
algorithms



Computing
Anytime, Anywhere



Big Data Era

TRANSFORMATION OF LABOUR MARKET INFORMATION / INTELLIGENCE

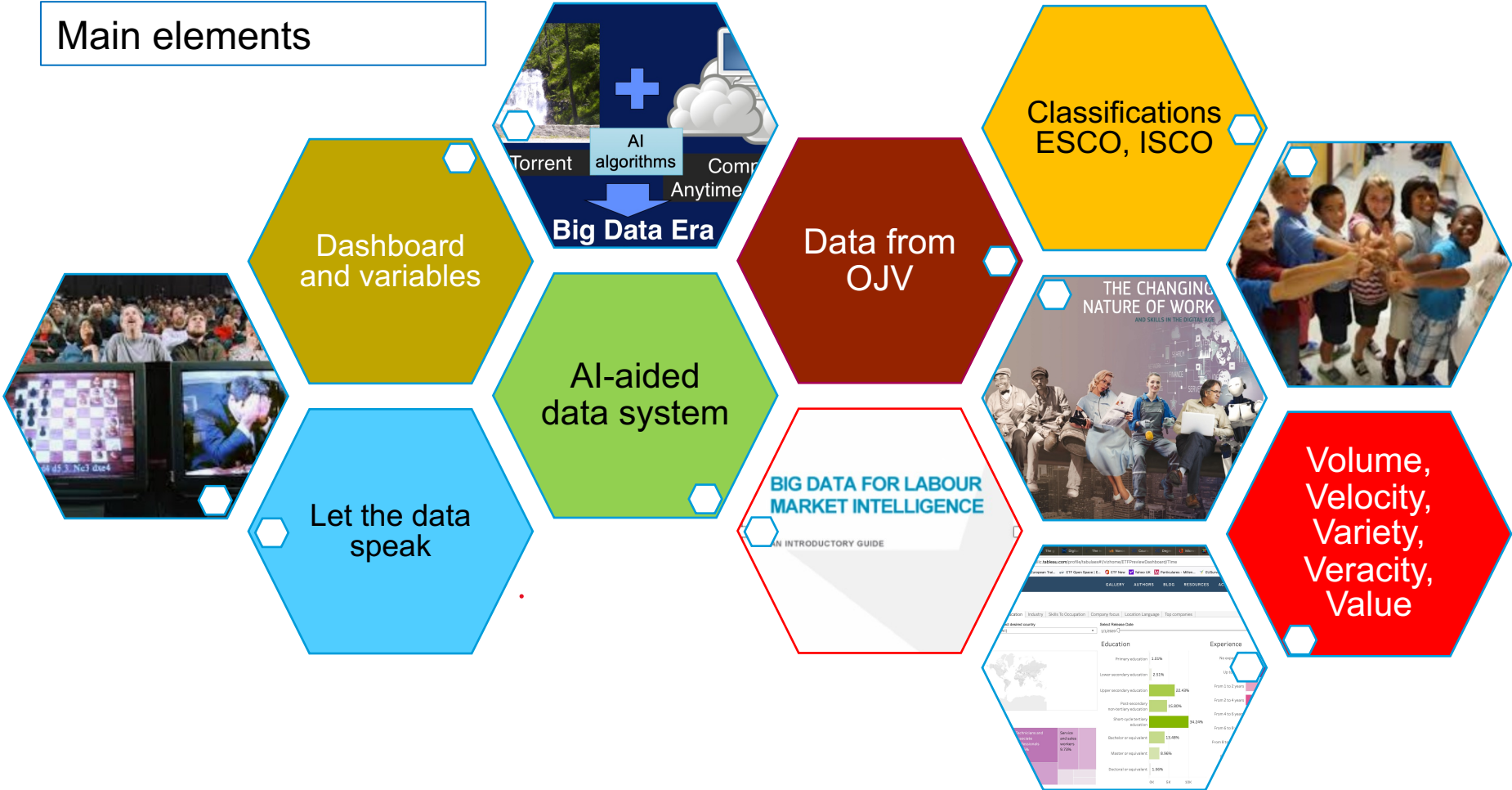
- **“Artificial intelligence (AI) and machine learning are not only changing the labour market, but also giving us new tools for analysing the workforce”.**
- **Terabytes of data from online job vacancies!** Job vacancies or job advertisements are published, refreshed, updated in large numbers through websites of different types, size and coverage
- Exploring the inherent information of a such large data source has become an objective of research centres and public bodies in a number of countries. **EU OVATE (Cedefop) is a major breakthrough!**
- **EUROSTAT:** embracing Smart Statistics
- These **vast and fast** data sources are essential to understand the transformation of jobs (as bundles of tasks and skills), of changing forms of work and employers' recruitment practices in the context of **Covid-19 (and Beyond...)**

ETF PROJECT BIG DATA FOR LABOUR MARKET INFORMATION

2018-2021

- **2018-2019: Methodology:** first step - project elaborated first a brief methodological handbook “Big Data for labour market intelligence: an introductory guide” (2019).
- **2019: First application:** Feasibility analysis – Landscaping of Web Labour Markets Tunisia and Morocco
- **2019:** A training programme for experts of the “Make it Match Network” of Eastern Partnership
- **2020:** Creation of the complete data system supported by AI with data visualisation platform (dashboard): **Tunisia and Ukraine;**
 - **Analytical reports: LM and skills Ukraine and Tunisia**
- **2021:**
 - New country – **Georgia;**
 - **Green dashboard;**
 - ETF works with the data analytics specialists of **University Milano-Bicocca and Burning Glass Technologies.**
 - The data system is based exclusively on **demand** – based on **job vacancies (OJV)** posted on web portals
 - Full comparability with the Real-Time data system of the EU-27 (same methodology)

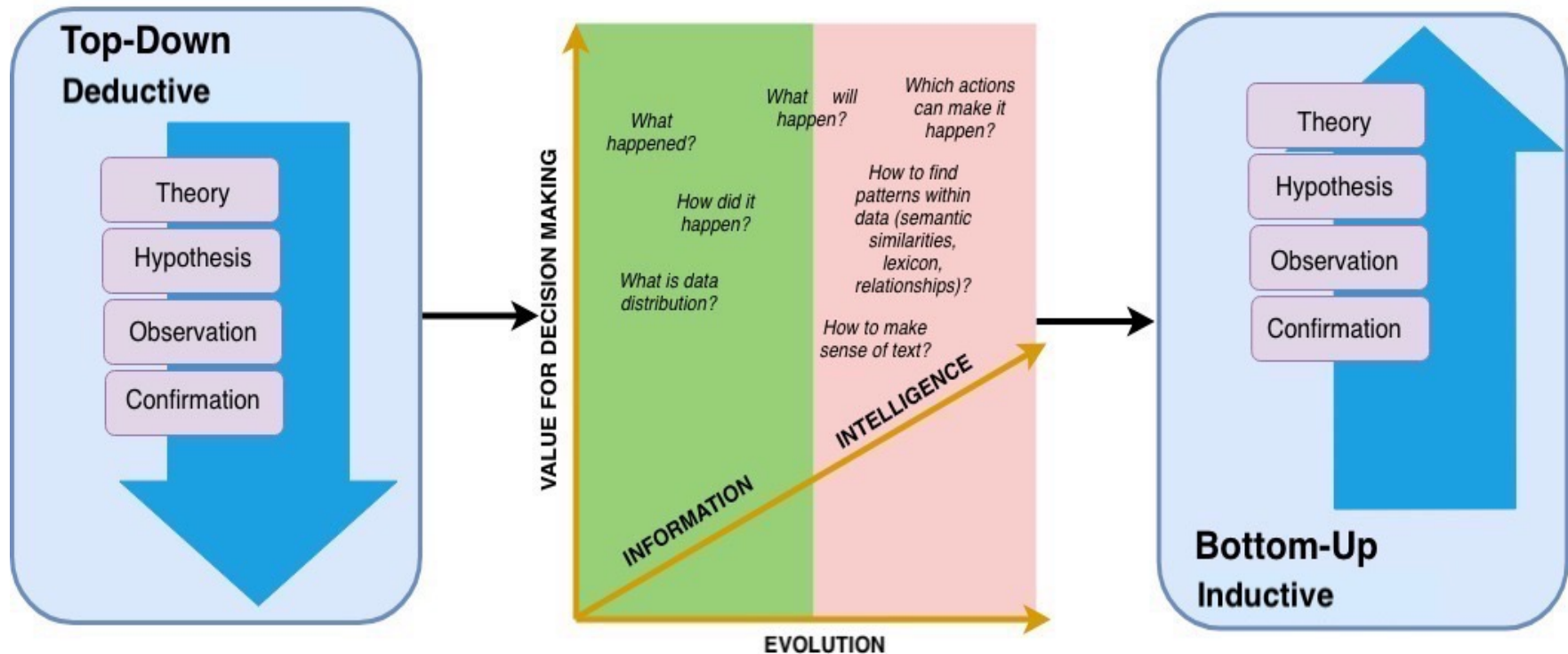
Main elements



DATA SOURCES LMI: SOME CHARACTERISTICS

Data Source	Type	Data model	Analysis paradigm
Statistical conventional (surveys)	Structured	Relational	Top-down & model based
Administrative (registers)	Structured or semi-structured	Relational	Top-down & model based
Web data	Structured, semi-structured or unstructured	Relational and non-relational (NoSQL)	Bottom-up & data driven

PARADIGM SHIFT: FROM TOP-DOWN TO BOTTOM-UP



BIG DATA FOR DEMAND ANALYSIS - DIMENSIONS



SKILLS NEEDS :
IDENTIFY AND
ASSESS



SKILLS RATES



EMERGING SKILLS
AND EVOLUTION OF
THE SKILLS MIX



LANDSCAPE OF OJV
WEBSITES AND
DYNAMICS OF
THEIR UTILISATION



SHARPEN THE QUESTIONS THAT
CAN BE ANALYSES



EXPLORE THE COMBINATION OF BIG
DATA AND CONVENTIONAL STATISTICS

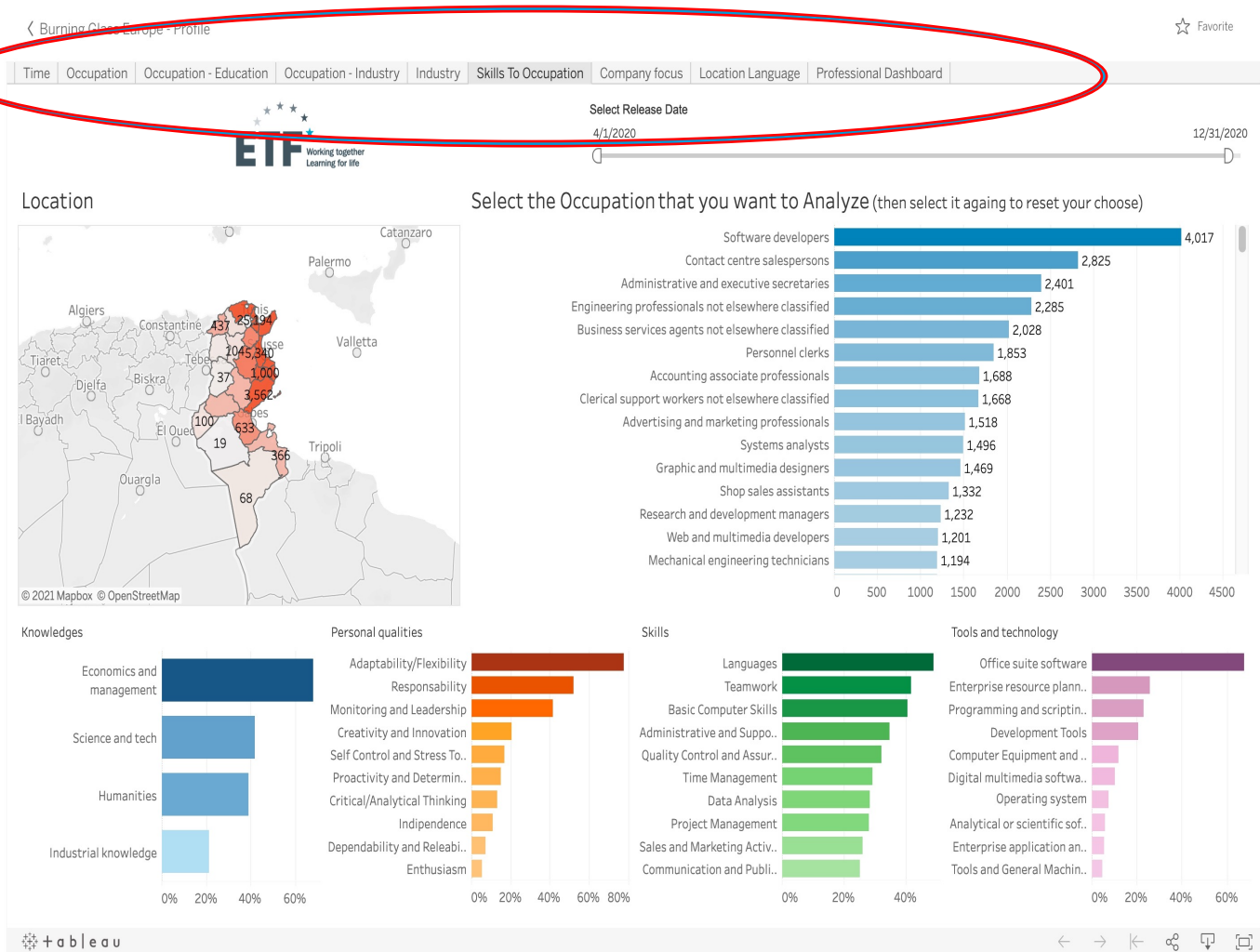
DATA CLASSIFICATION – TAXONOMIES

- **Occupations:**
ESCO/ISCO
- **Skills:** ESCO
- **Location:** NUTS and ISO
- **Educational Level:**
ISCED
- **Sector:** NACE

DASHBOARD: SKILLS AND OCCUPATIONS

Variables:

1. Occupation
2. Skills
3. Education level
4. Experience
5. Salary
6. Location



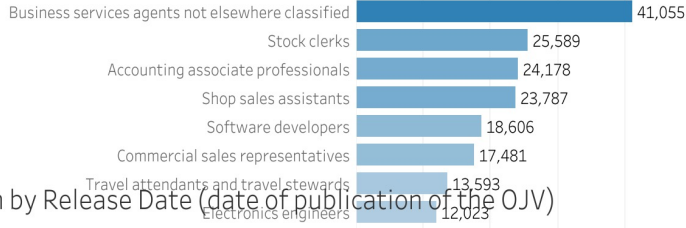
If you want, you can filter by occupation family:

ESCO (Level 1)
All

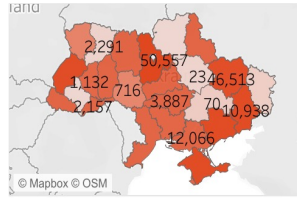
ESCO (Level 2)
All

ESCO (Level 3)
All

Select the Occupation that you want to Analyze (then select it again to reset your choice)



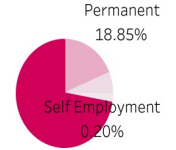
Location



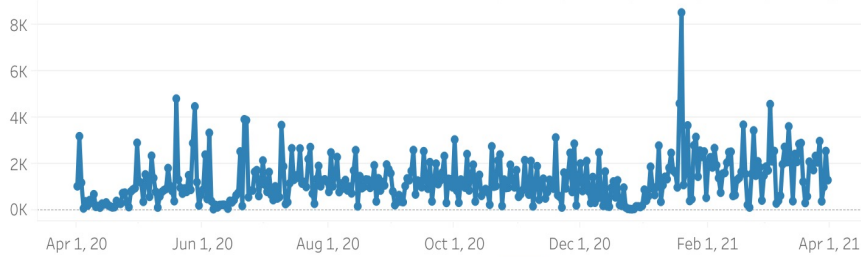
Industry (level 1 NACE)



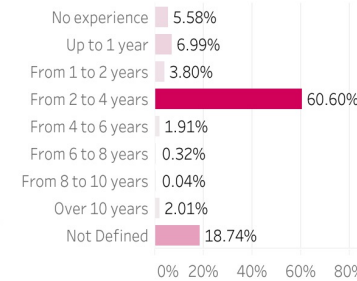
Contract



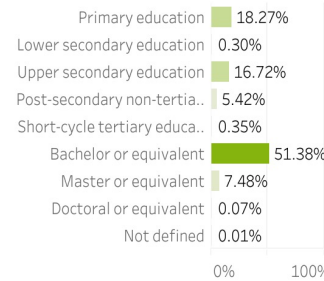
Distribution by Release Date (date of publication of the OJV)



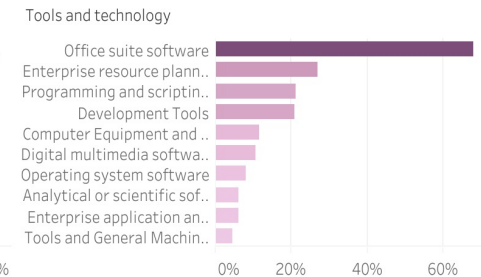
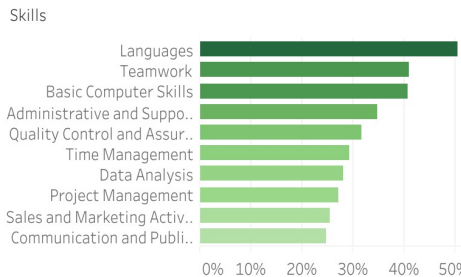
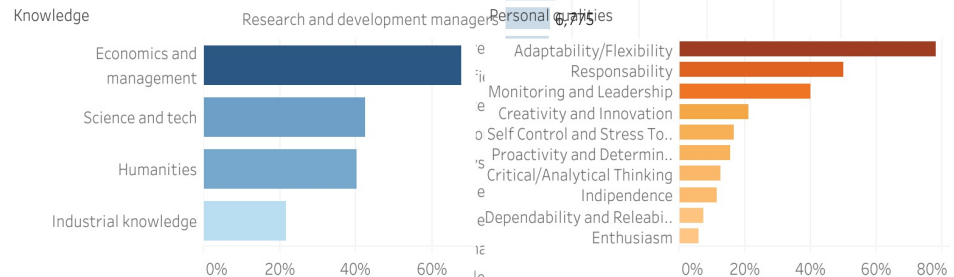
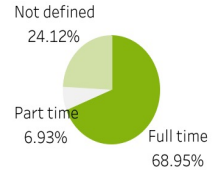
Experience



Education



Working hours





GAME CHANGER?

- **New data source: vast, non-structured, inductive, continuous inflow data**
- **New data analysis and classification**
- **New paradigms - open our mind for different views on data**





THE GOLD MINE OF OJV DATA:

REAL TIME, FAST AND GRANULAR DATA

**THE LINKS THAT CAN BE DONE WITH OTHER DATA SETS
(STATISTICAL) AND OTHER BIG DATA DATABASES**

**BUT NOTE! BIG DATA - COVERS PART OF THE LABOUR
MARKET (SECTORS, OCCUPATIONS, QUALIFICATIONS)**



SKILLS LAB

THANK YOU