

Atelier CNC de Dakar  
2-4 mai 2024

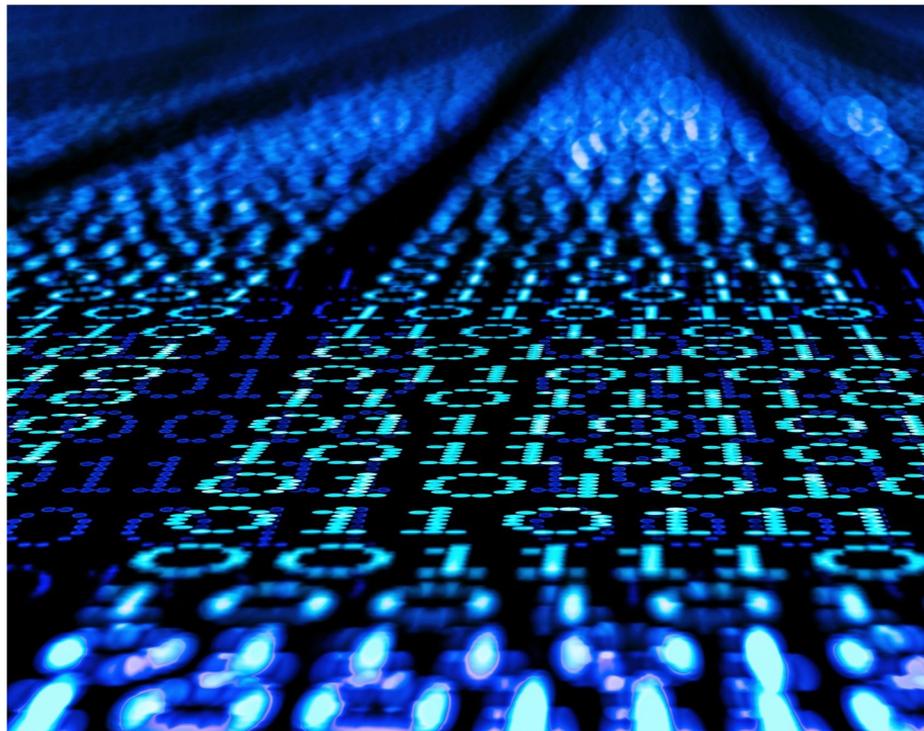
Le Big Data ajoute de la valeur  
à l'Intelligence Compétences

Analyse des offres d'emploi en  
ligne

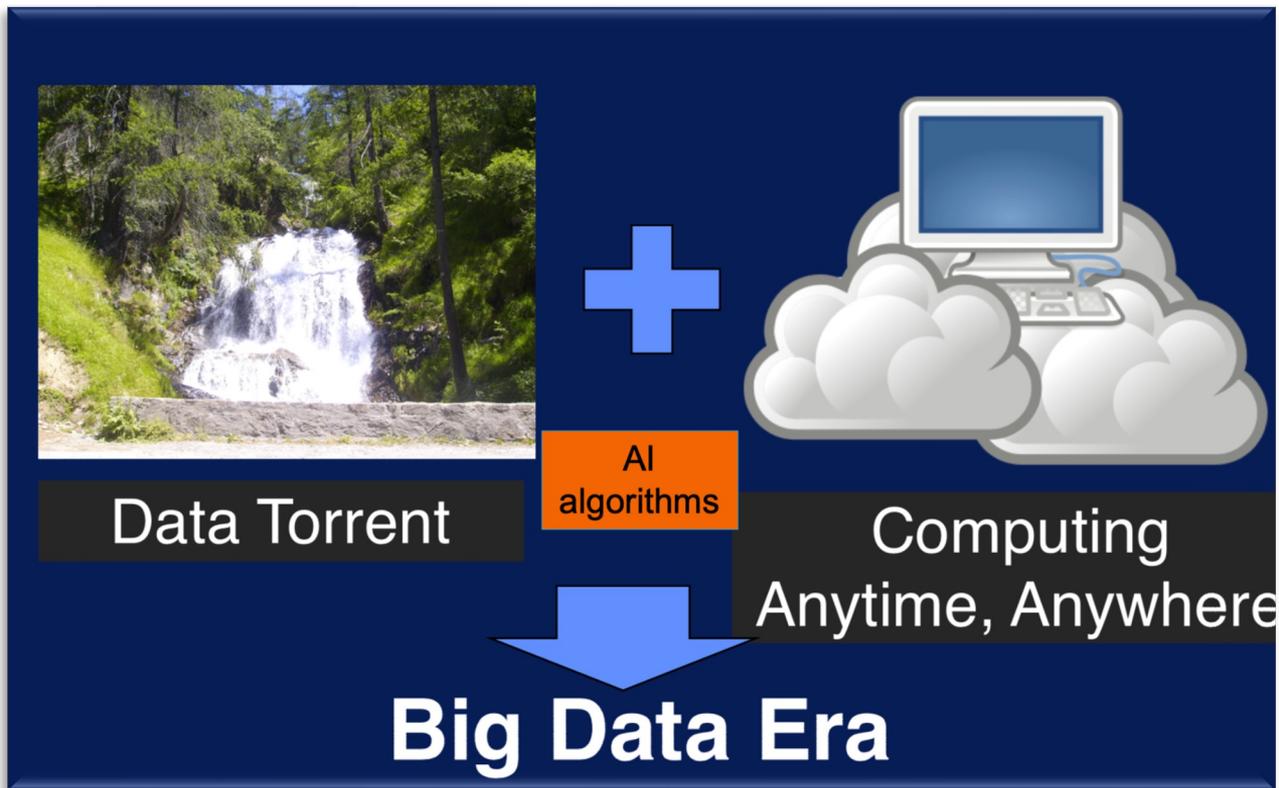
Professions, Compétences,  
Compétences vertes et  
numériques

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Coordinator ETF Big Data LMIS project

[ecb@etf.europa.eu](mailto:ecb@etf.europa.eu)



# Big Data pour l'intelligence du marché du travail et des compétences



# De grands volumes de données sur les offres d'emploi des employeurs en ligne : nouvelle source d'information sur le marché du travail et les compétences

Offres d'emploi en  
ligne  
(OJV)



# L'OBJECTIF DE L'ANALYSE DES OFFRES D'EMPLOI EN LIGNE EST...

Pour transformer ceci...



...en valeur

The collage shows several job listings with details such as location, application deadline, and salary. For example, one listing for 'Junior Software Developer' is located in 'United Kingdom' and has an application deadline of 'Saturday, 30 September 2017'. Another listing for 'Lead Clinical Data Manager' is 'Office or home based' in 'Milano, Lombardia' with a salary of '€40.000 - €50.000 all'anno'.

Most relevant skill in digital occupations

WOLLYBI  
powered by Tabular

Labour Market Intelligence - Dashboard Preview

Select desired country: [Italy] | Select desired sources: [Jobs] | Select Release Date: [10/20/2016]

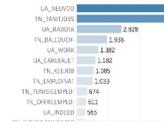
Number of job vacancies collected (excluding ru and uk languages)

43.418

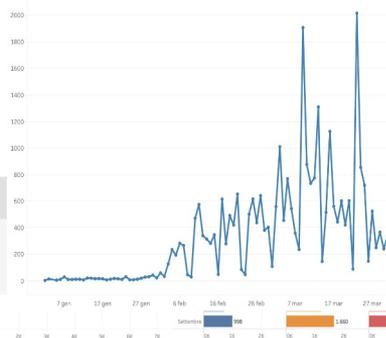
Number of job vacancies deduplicated (excluding ru and uk languages)

29.120

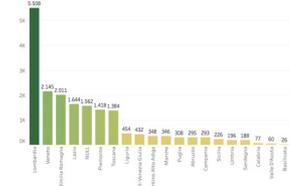
Sources



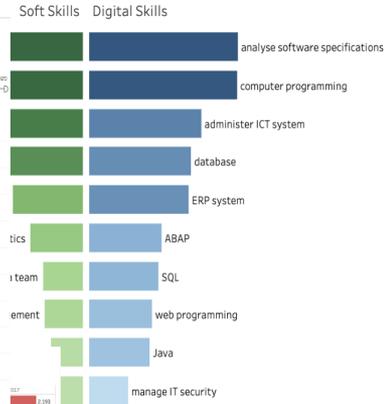
Release Date (date of publication of the OJV)



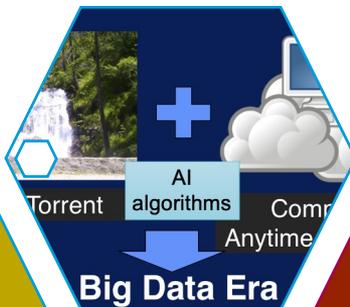
Regione



Comune



# Système d'analyse OJV : éléments constitutifs



3. International Classifications ESCO, ISCO, NACE...



1. Data from OJV  
Complémente la statistique



2. Système de données assisté par l'IA



4. Tableau de bord de visualisation - variables



5. Laissez parler les données

6. Volume, Vitesse, Variété, Véracité, Valeur



# Big Data pour LMI - OJV

All country Dashboards at:

[https://solutions.lightcast.io/?pc=x\\$fhADtD\\*cu\\$BjY9](https://solutions.lightcast.io/?pc=x$fhADtD*cu$BjY9)

**Methodological Guide:** <https://www.etf.europa.eu/en/publications-and-resources/publications/big-data-labour-market-intelligence-introductory-guide>

- Début : 2019 (Manuel)
- Expertise en science des données : Lightcast.
- Données : flux entrant constant ; Mises à jour : mensuelles
- 12,5 millions de OJV collectés dans la base de données

Pays dans la base de données et les tableaux de bord des ETF:

- Ukraine
- Tunisia
- Georgia
- Kenya
- Egypt
- Morocco

## Standard variables on ETF dashboards - Analysis by:

- Métier
- Métier– education
- Métier – secteur
- Secteur
- Métiers – compétences (ESCO)
- Métiers – compétences (O\*Net)
- Lieu – language
- Tableau de bord professionnel
- Nouveau : compétences vertes, compétences numériques

# FLUX DE DONNÉES



Panorama et évaluation des sources de VJ  
sur un marché du travail donné

Collecte des  
données

Traitement

Interface Frontal



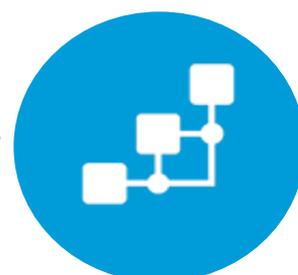
Data  
Ingestion



Pre-Processing



Information  
Extraction



ETL



Presentation  
Area

# Présentation interactive des résultats – données classifiées du JO

All country Dashboards at:

[https://solutions.lightcast.io/?pc=x\\$fhADtD\\*cu\\$BjY9](https://solutions.lightcast.io/?pc=x$fhADtD*cu$BjY9)

## Exemples

# Professional dashboard (all major variables) – Kenya

Home Time Professional Dashboard Green skill Digital skill Occupation Occupation to skill Occupation to skill - O\*NET Occupation - Education Occupation - Industry Industry Location Language FC



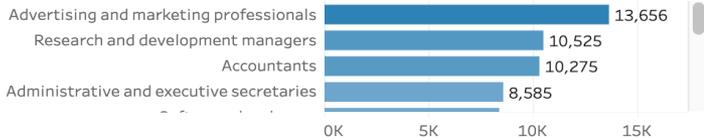
If you want, you can filter by occupation family:

ESCO (Level 1) (All) ESCO (Level 2) (All) ESCO (Level 3) (All)

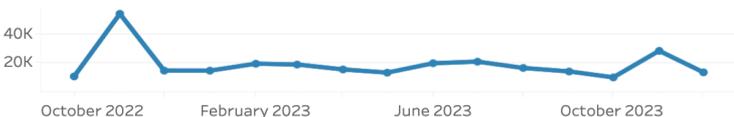
Select Release Date

October 2022  December 2023

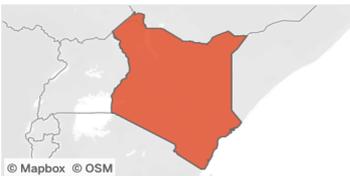
Select the Occupation that you want to Analyze (then select it again to reset your choice)



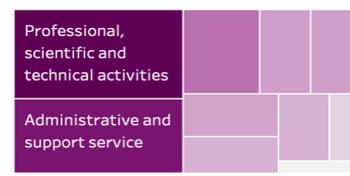
Distribution by Release Date (date of publication of the OJV)



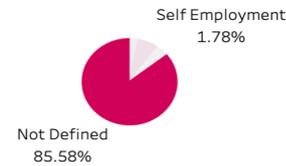
Location



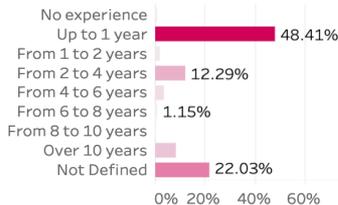
Industry (level 1 NACE)



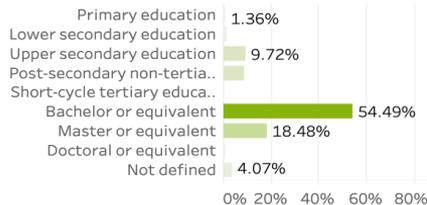
Contract



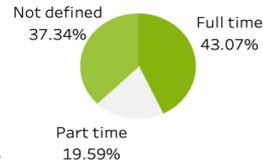
Experience



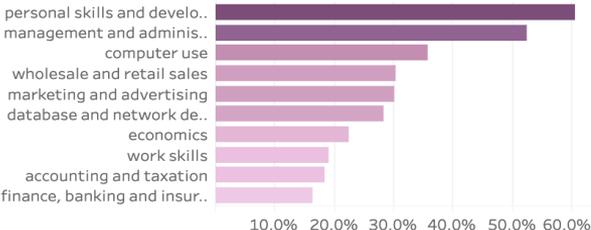
Education



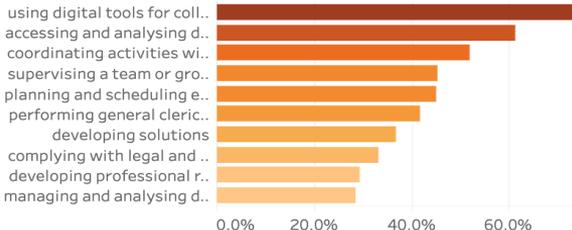
Working hours



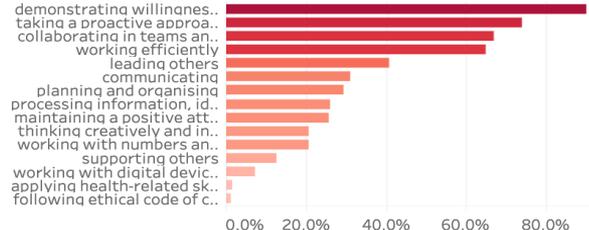
Knowledge



Skills



Transversal Skills and Competences



Skill data refer to Online Job Vacancies published in the last 12 months available for analysis

Legend: Training / Education

# Professional dashboard - Egypt

Home Time Professional Dashboard Green skill Digital skill Occupation Occupation to skill Occupation to skill - O\*NET Occupation - Education Occupation - Industry Industry Location Language



If you want, you can filter by occupation family:

ESCO (Level 1)

(All)

ESCO (Level 2)

(All)

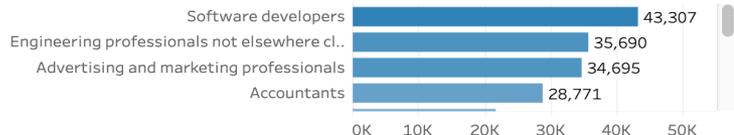
ESCO (Level 3)

(All)

Select Release Date

January 2021 December 2023

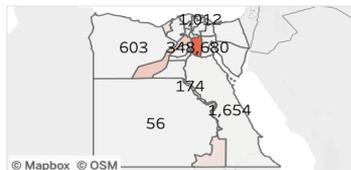
Select the Occupation that you want to Analyze (then select it again to reset your choice)



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



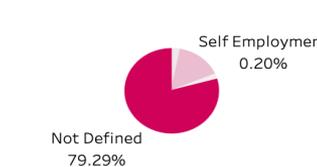
Location



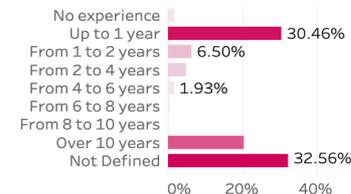
Industry (level 1 NACE)



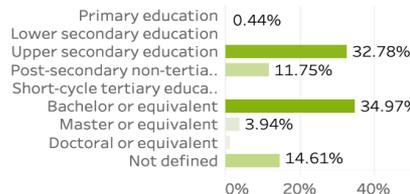
Contract



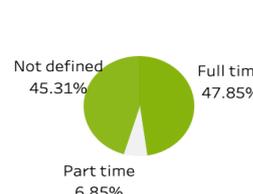
Experience



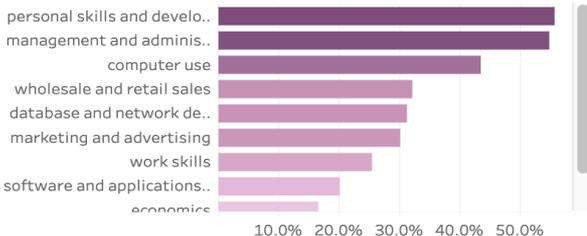
Education



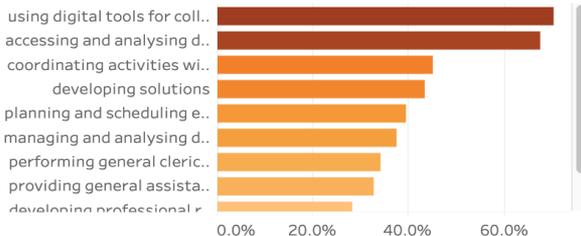
Working hours



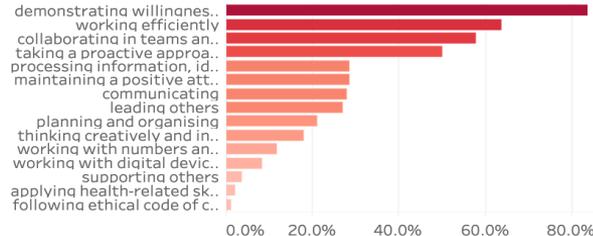
Knowledge



Skills



Transversal Skills and Competences



Skill data refer to Online Job Vacancies published in the last 12 months available for analysis

# Remote work - Ukraine



Select Release Date

April 2020

December 2023

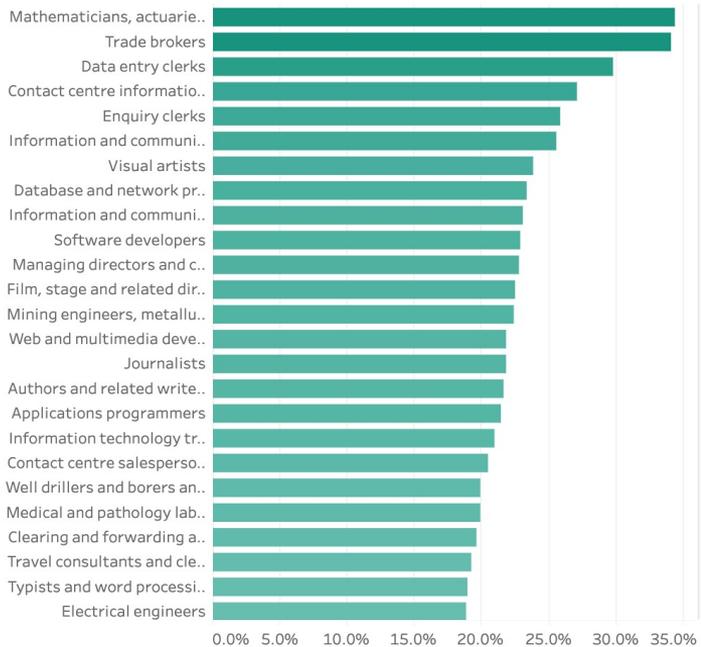
## Remote Work Share

5.41%

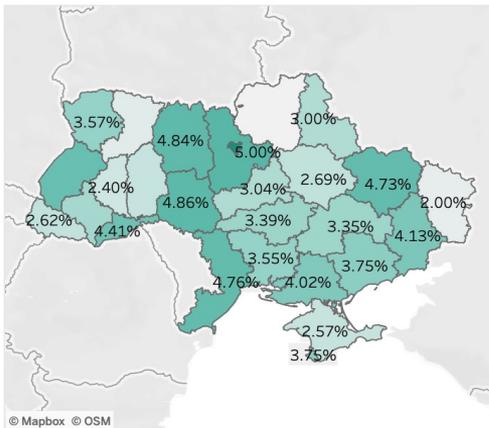
## Number of remote work OJV

161,210

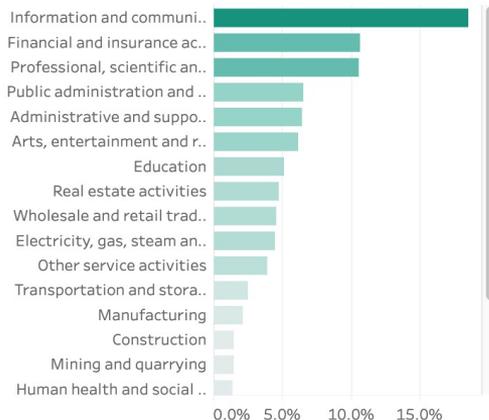
Select the Occupation that you want to Analyze (then select it again to reset your choose)



## Share of remote work by region



## Share of remote work by industry



## Share of remote work by release date





# COMPÉTENCES VERTES

DANS LE SYSTÈME DE DONNÉES ETF OJV - ÉGYPTE

# Definitions

Les compétences vertes – un domaine important de débat et d'action politique et qui est devenu une priorité dans la recherche (quantitative et qualitative) et la communication sociale. Plusieurs organisations internationales travaillent sur l'analyse et les taxonomies liées aux compétences vertes.

Le Cedefop définit les compétences vertes comme suit : "les connaissances, les compétences, les valeurs et les attitudes nécessaires pour vivre, travailler et agir dans des économies et des sociétés qui cherchent à réduire l'impact de l'activité humaine sur l'environnement ».

Les compétences pour l'économie verte consistent à :

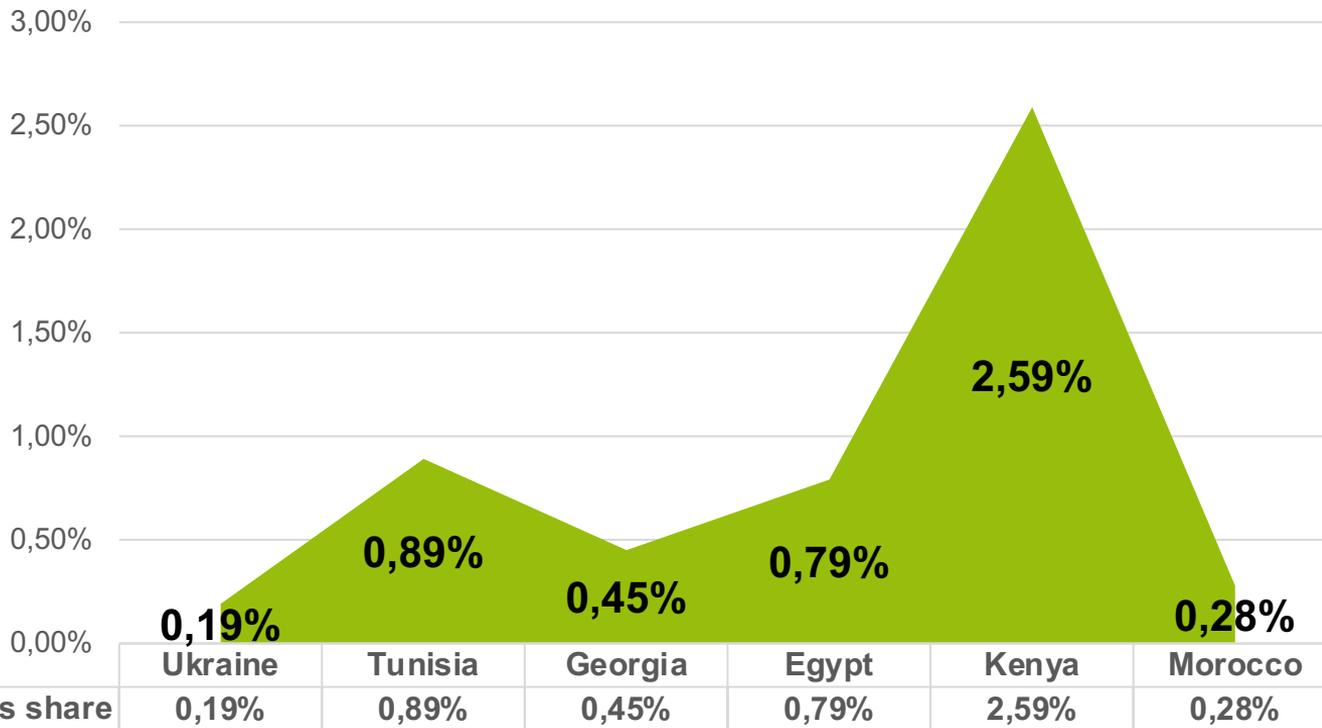
- des compétences transversales, liées à la pensée et à l'action durables, pertinentes pour tous les secteurs et métiers économiques ;
- les compétences spécifiques nécessaires à l'adaptation ou à la mise en œuvre de normes, de processus et de services permettant de protéger les écosystèmes et la biodiversité et de réduire la consommation d'énergie, de matériaux et d'eau ;
- Des compétences hautement spécialisées nécessaires au développement et à la mise en œuvre de technologies vertes telles que les énergies renouvelables, le traitement des eaux usées ou le recyclage.;
- Les compétences pour l'économie verte sont également appelées compétences pour les emplois verts, compétences pour la transition verte ou compétences vertes.

# Taxonomies

- ETF green skills list
- 225 terms (data-driven identification) – now integrated in ESCO
- 7 clusters of sustainable activity (inspired by the European Green Deal)

# Projet ETF : Offre d'emploi en ligne – Big data pour l'IMT

## Green skills % - data until 31/07/2023



Green skills share  
= share of online  
job vacancies that  
required at least 1  
green skill

Kenya: highest  
green skills share,  
Ukraine – the  
lowest

Used green skills  
taxonomy: ETF  
(225 terms)



## Top 20 Green Skills Kenya

Skills / skill set	% (from 20)	Nº unique job postings
renewable energy	22,95%	2.598
agroforestry	9,08%	1.028
clean energy	6,54%	740
sustainable business	6,47%	732
solar energy	6,27%	710
circular economy	5,64%	638
environmental sustainability	5,48%	620
development economics	5,05%	572
biomass	4,22%	478
solar systems	3,45%	390
environmental protection	3,41%	386
energy efficiency	3,41%	386
sustainable energy	3,38%	382
sustainable agriculture	2,99%	338
climate smart agriculture	2,54%	288
green energy	2,31%	262
iso 14001	2,19%	248
agroecology	1,80%	204
solar products	1,63%	184
electric vehicle	1,18%	134

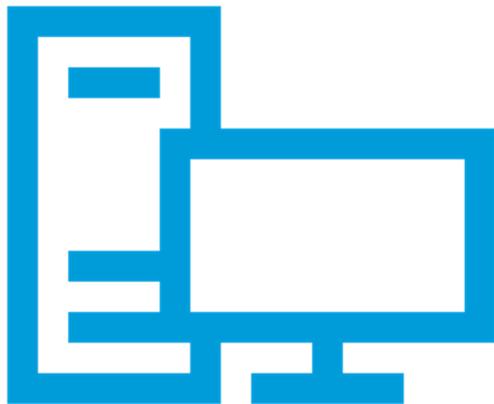
# Kenya : Compétences vertes requises pour certaines professions

Occupation	Green skill	Unique Job postings (Oct 22- Jul 23)
Electronics mechanics and servicers	solar panels	7
	solar energy	2
	environmental protection	2
Environmental engineers	environmental sustainability	32
	environmental protection	19
	sustainable procurement	9
	renewable energy	9
	sustainable business	7
	energy efficiency	7
	sustainable energy	5
	circular economy	4
	development economics	3
	climate smart agriculture	3
	green energy	2
	ecotourism	2
	clean energy	2
	carbon footprint reduction	2
	sustainable agriculture	1
	sustainability performance	1
	iso 14001	1
hydroponics	1	
clean technology	1	
agroforestry	1	
Metal production process controllers	iso 14001	2
Statistical, mathematical and related associate professionals	environmental protection	18
	clean energy	18
	energy efficiency	11
	green building	9
	sustainable materials	6
	sustainable building	6
	sustainable agriculture	6
	renewable energy	5
	circular economy	5
	biomass	4
	agroforestry	4
	sustainable energy	3
	hydropower	1
biofuels	1	

# Compétences numériques – aperçu de certaines caractéristiques de la demande



Analysis based on ETF data OJV - Egypt



# Digital skills

Capacité à utiliser les technologies numériques de manière confiante, critique et responsable et à s'engager avec elles pour apprendre, au travail et pour participer à la société.

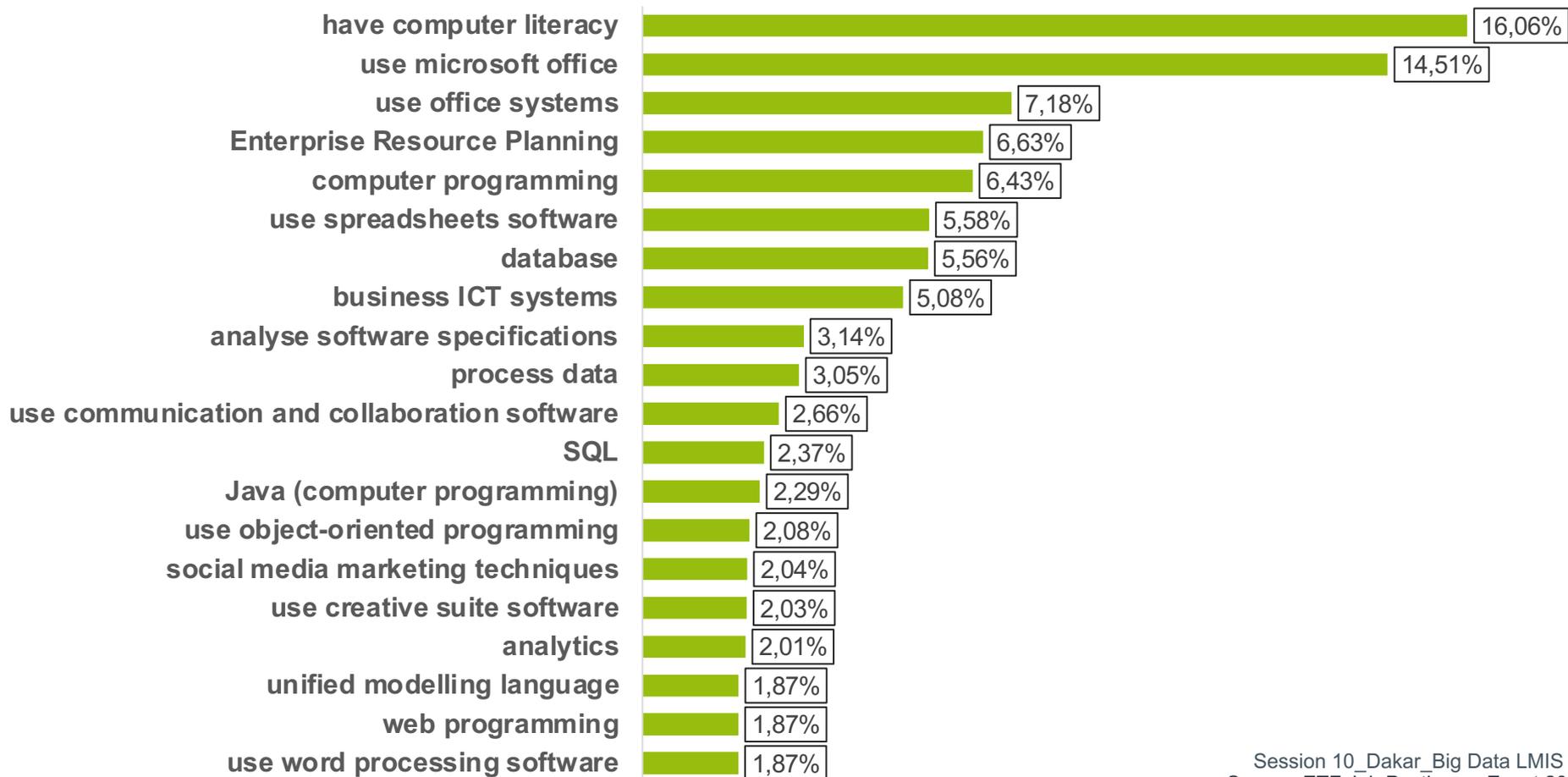
Il comprend la maîtrise de l'information et des données, la communication et la collaboration, l'éducation aux médias, la création de contenu numérique (y compris le codage), la sécurité (y compris le bien-être numérique et les compétences liées à la cybersécurité), les questions de propriété intellectuelle, la résolution de problèmes et la pensée critique.

# Taxonomy

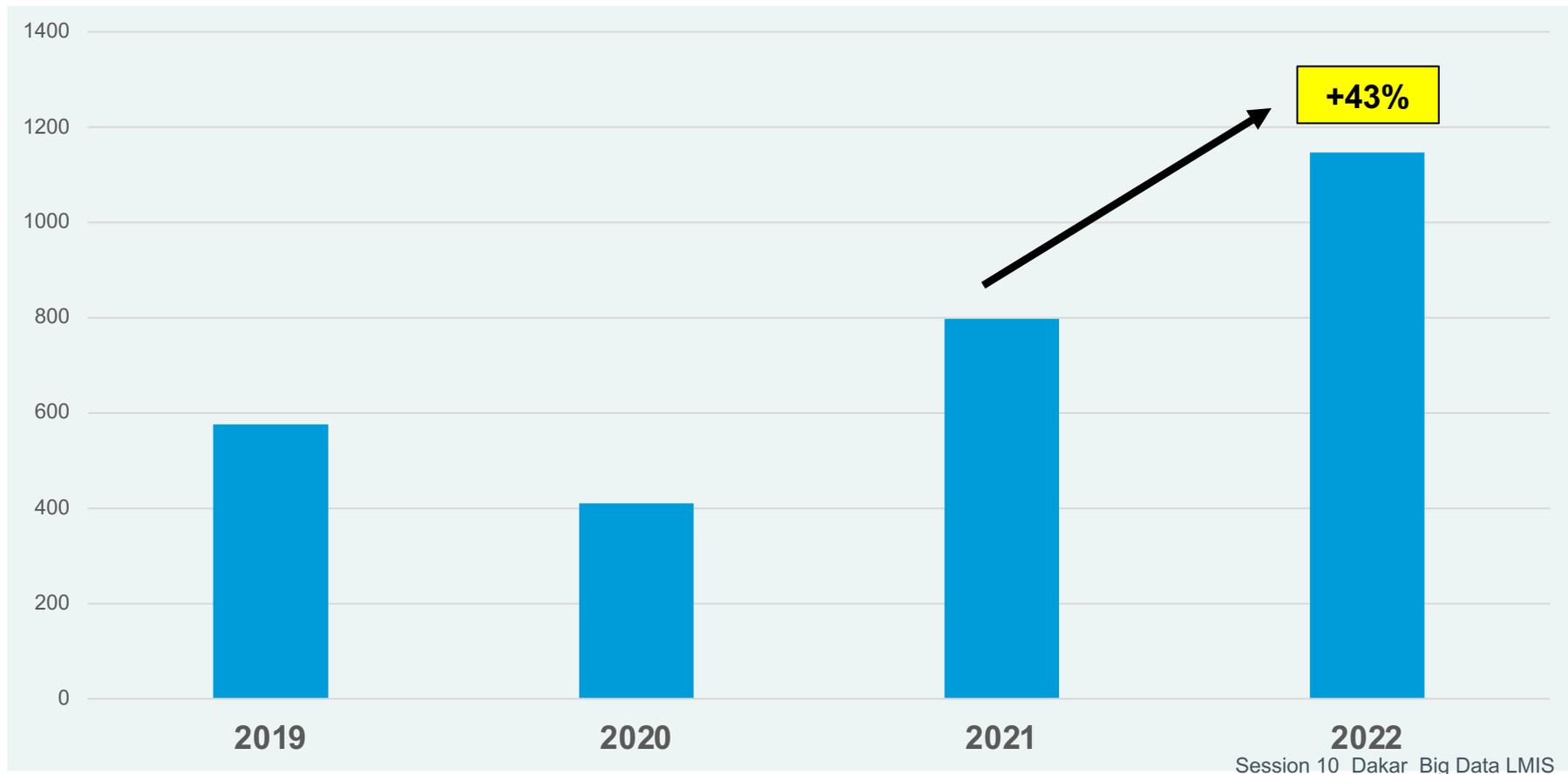
- **ESCO: 1,100 termes relatifs aux compétences numériques**
- Other sources of digital skills terms: Stackoverflow and Git-Hub – to ease classification

<b>Digital skill</b>		<b>Unique Job postings (Oct 22-Jul 23)</b>
use microsoft office	21,2%	133.629
have computer literacy	19,2%	121.093
office software	7,6%	47.684
database	5,7%	35.886
use spreadsheets software	5,4%	33.935
computer programming	5,4%	33.775
business ICT systems	4,0%	25.000
perform data analysis	3,8%	24.040
online analytical processing	3,5%	21.879
process data	3,2%	19.941
social media marketing techniques	3,0%	19.083
use communication and collaboration software	2,9%	18.554
use word processing software	2,6%	16.306
analyse software specifications	2,3%	14.409
digital marketing techniques	2,0%	12.549
use creative suite software	1,9%	11.825
use software design patterns	1,7%	10.686
computer science	1,7%	10.611
use object-oriented programming	1,5%	9.463
administer ICT system	1,5%	9.337

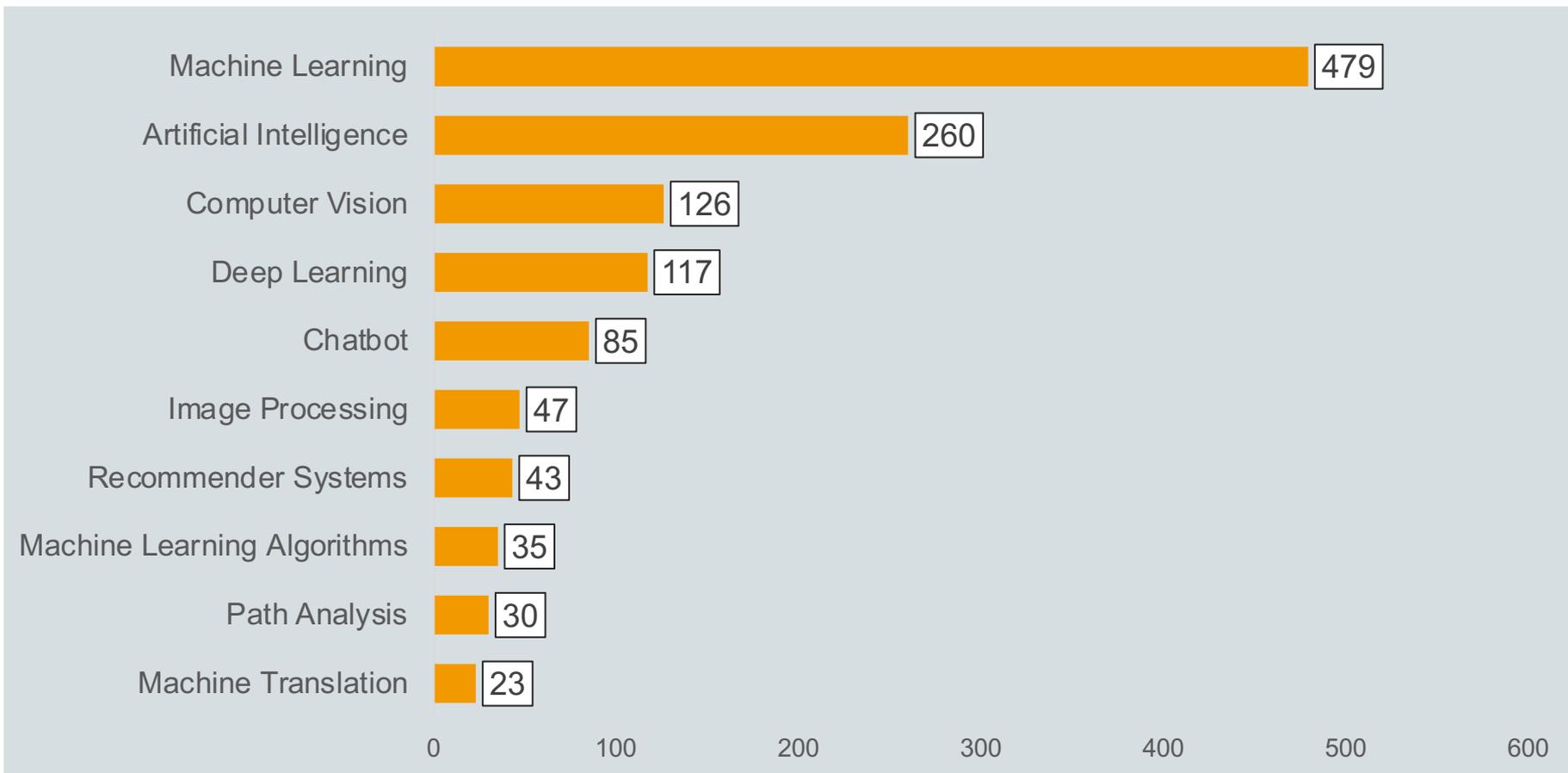
# Égypte : COMPÉTENCES NUMÉRIQUES - TOP 20



# COMPÉTENCES EN IA : OFFRES D'EMPLOI UNIQUES - Egypte



# COMPÉTENCES EN IA : LES PRINCIPALES COMPÉTENCES DANS LES DONNÉES OJV

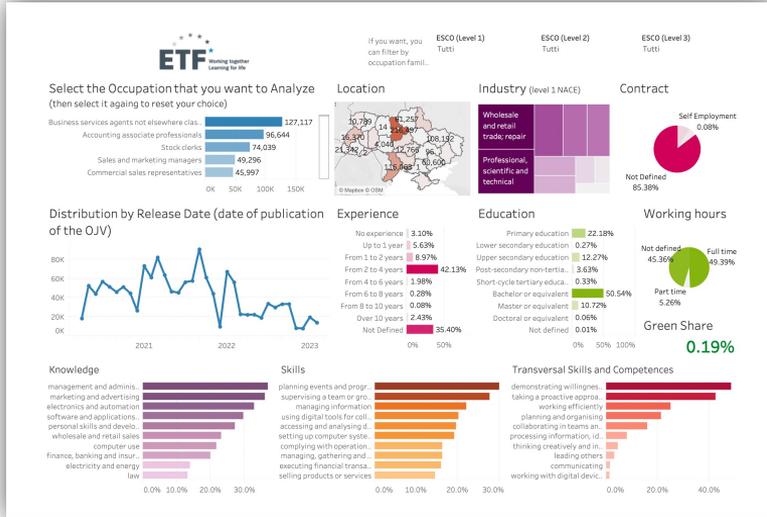


# COMPÉTENCES NUMÉRIQUES : DANS LES MÉTIERS NUMÉRIQUES ET NON NUMÉRIQUES

Occupation (ISCO 08)	Unique OJV 2022	Digital skills rate	Soft skills rate	Occupational-specific non digital skills rate
Database designers and administrators	158	54,00%	20,00%	26,00%
Web and multimedia developers	5418	48,00%	23,00%	29,00%
Systems administrators	1366	47,00%	25,00%	28,00%
Applications programmers	1343	44,00%	24,00%	32,00%
Software developers	14752	40,95%	26,32%	32,73%
Data entry clerks	351	40,13%	30,64%	29,23%
Mathematicians, actuaries and statisticians	174	39,08%	28,53%	32,38%
Database and network professionals	1780	38,77%	26,57%	34,66%
Computer network professionals	397	38,29%	29,08%	32,63%
Systems analysts	6593	28,64%	33,62%	37,74%
Graphic and multimedia designers	3686	25,39%	25,93%	48,69%
General office clerks	2022	21,92%	44,19%	33,89%
Environmental engineers	58	19,53%	36,15%	44,31%
Business services and administration managers	1785	15,78%	40,38%	43,84%
Personnel and careers professionals	4122	15,77%	39,97%	44,26%
Accounting and bookkeeping clerks	240	11,88%	33,99%	54,13%
Handicraft workers in textile, leather and related materials	2022	19,75%	31,85%	48,41%

# Big Data LMIS ETF project

## Nouvelles initiatives utilisant notre base de données, d'autres sources de données et ESCO - 2024



- Profils professionnels – basés sur les données, basés sur l'ESCO (ACQF-II – pour les profils communs de qualifications)
- Rapport sur la demande de compétences vertes – axée sur les données et fondée sur l'ESCO
- Demande de compétences numériques - rapport
- Côté offre – profils sociaux (ESCO Skills)
- Combinaison de données (OJV, statistiques conventionnelles, administration)

# NOTES FINALES

## 1. Valeur des données OJV

- *Données en temps quasi réel*
- *Volume : permet différents angles d'analyse sur les compétences et les métiers ; granularité*
- *Repérage précoce de nouvelles compétences / nouveaux modèles de mix de compétences (digitales, soft, techniques, vertes...). Pour une analyse plus approfondie en combinaison avec des sources de données statistiques conventionnelles et d'autres sources de données*
- *Transition écologique et numérique : Identification des compétences demandées ; les tendances quantitatives au fil du temps – par profession et par secteur ; les profils de compétences vertes et numériques des professions ; Compétences et professions en IA ; et la mise en place de benchmarks / comparaisons internationales.*
  - *Identification des emplois verts en forte demande ; diriger les industries et les régions dans la création d'emplois verts ; Qualifications pour les emplois verts*
  - *L'évolution des compétences numériques et l'émergence de nouveaux métiers ; Croissance des emplois nécessitant de nouvelles connaissances et compétences.*
- *Valeur ajoutée aux politiques et pratiques en matière d'IMT et de développement des compétences : tendances émergentes en matière de LM et de compétences ; Éclairer les réponses politiques;*

## 2. Limitations

- *Surreprésentation de certains groupes professionnels (professionnels – 55 %) ; sous-représentation (dans les professions générales exigeant un niveau de compétences et de qualifications inférieur).*
- *Classification des données OJV : techniques robustes, évolution constante, taxonomies en transformation.*



# Thank you

**European Training Foundation**

Eduarda Castel-Branco

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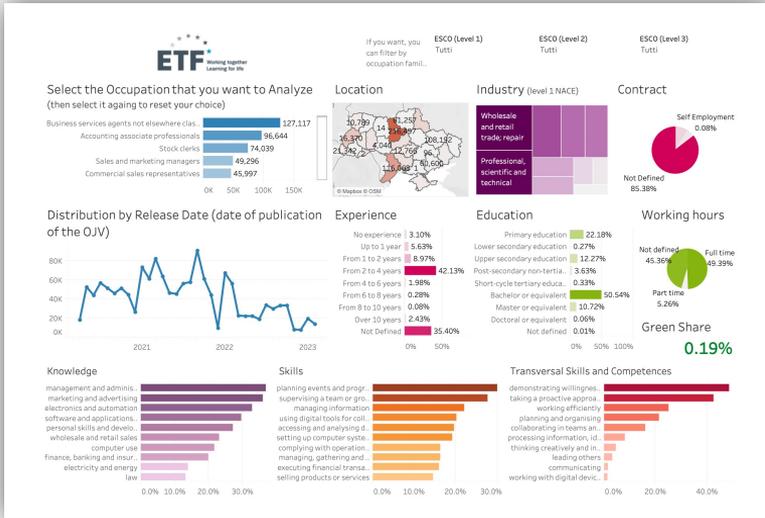


# 02

**ANNEXE : à titre de référence  
et de lecture complémentaire  
(pas de présentation)**

# ETF project

## Big Data for LMI 2018-2024



- **2018-2019: Methodology:** first step - brief methodological handbook “[Big Data for labour market intelligence: an introductory guide](#)” (published in 2019).
- **2019: First application:** Feasibility analysis – Landscaping of Web Labour Markets Tunisia and Morocco
- **2019-2021:** 3 main training programmes for experts of the partner countries and other regions(Asia, Africa)
- **2020:** Creation of the complete OJV analysis system and dashboards: Tunisia and Ukraine
  - Analytical reports: LM and skills Ukraine and Tunisia
- **2021:**
  - New country – Georgia;
  - **Green dashboard 3 countries**
- 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)
- ETF works with the data analytics specialists of **University Milano-Bicocca and LightCast**
- **2022:** expansion new countries, new themes analysis: Egypt, Kenya; **2023:** Morocco. Selection – based on results of landscaping study.
- **New themes:** Supply side analysis.
  - Training and capacity development programme: materials, PPTs, videos – all accessible online for free use and sharing

# ONLINE JOB ADVERTISEMENTS

The screenshot displays the Target Recruitment & HR Solutions website. At the top left is the Target logo with the tagline 'Recruitment & HR Solutions'. A navigation menu includes 'Executive Recruitment', 'Human Resources Solutions', 'HR Services', 'Global Staffing', and 'Vacancies'. On the right, there are links for 'Our Clients' and 'Our Locations'. The main heading reads 'JOB SEEKERS Find a job you'll love'. Below this is a search bar with the placeholder text 'Job title or Keyword' and a red 'Search Job' button. A message states '95817 jobs found for you'. Three job listings are visible, each with a category tag, title, date, and a 'Read More' link:

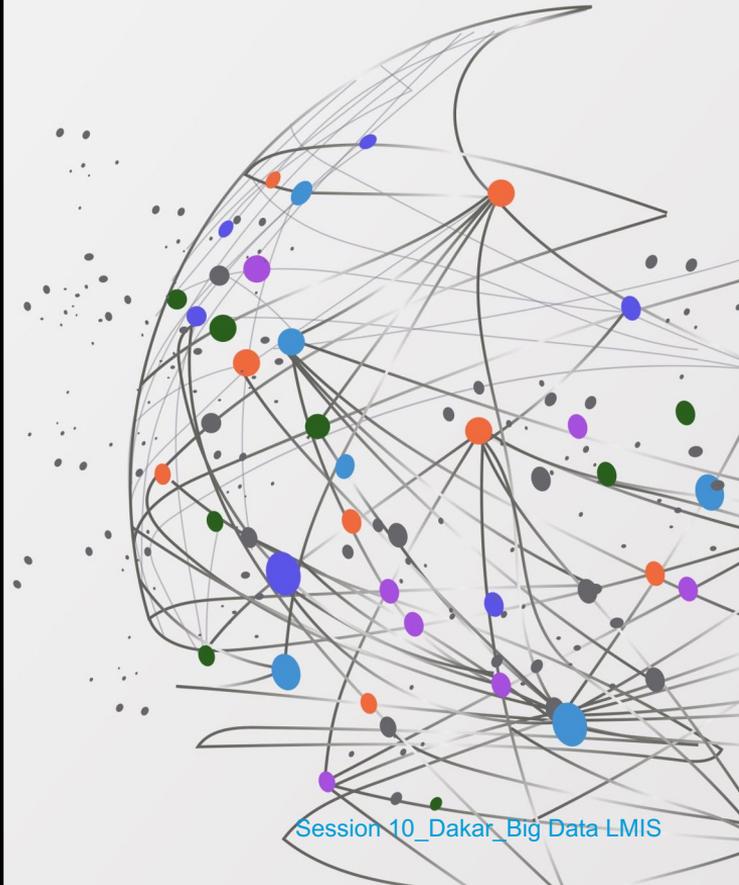
- Uncategorized** (13 Oct): **VMware Expert**. A very good opportunity in Cairo, Egypt, for an experienced "VMware Expert." Check the full details below and apply through the attached email. Job Description: - Support VMware products deployed.
- Engineering** (28 Sep): **Business Analyst**. An excellent opportunity in New Cairo, Egypt, for a well-experienced and professional Business Analyst. The company operates in Electronics/Electronic Manufacturing industry. Check the full details below and apply through the
- Human Resources** (22 Aug): **HR Coordinator**. A multinational company is hiring an "HR Coordinator" for its office in Cairo, Egypt. Job Title: HR Coordinator Job Location: Cairo Company's Category: Multinational Company About the HR Coordinator

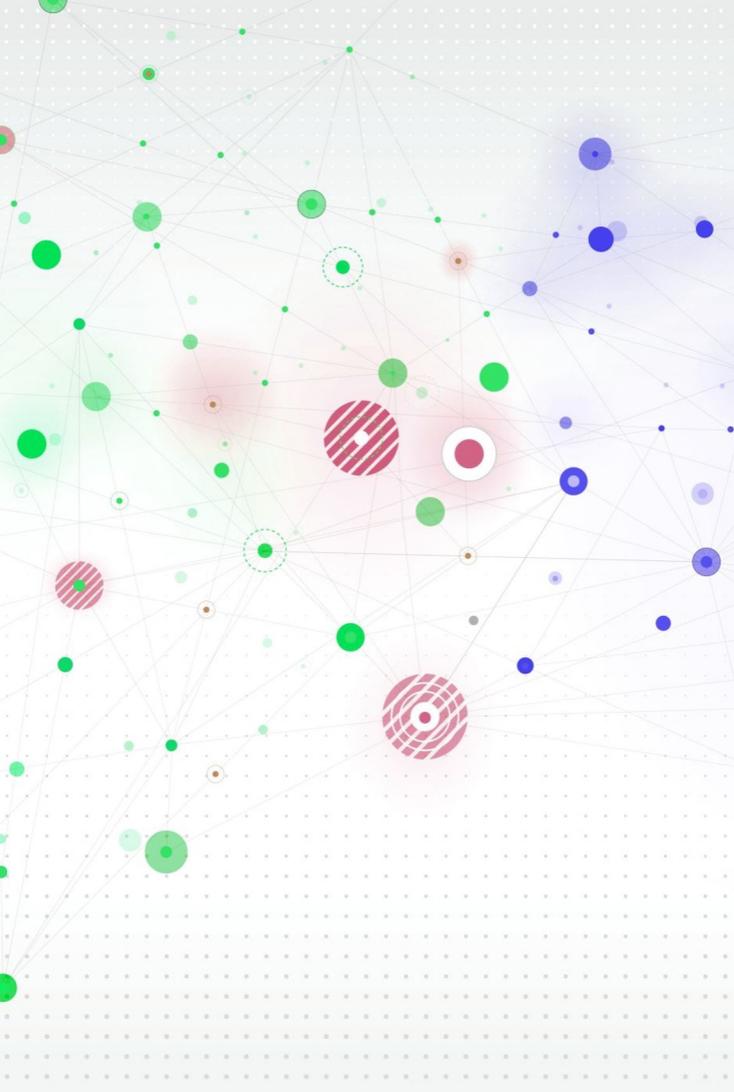
- Online job advertisements (OJAs) refer to advertisements published on the internet.
- Volume of OJAs is growing
- OJAs usually include data on the characteristics of the job (e.g. occupation and location), characteristics of the employer (e.g. economic activity) and requirements (e.g. education/skills).
- Part of this information is available only as natural language textual data.
- This type of big data requires specific methodologies for processing and analysis but also provides much more detailed information (compared to alternative data sources) and avoids pre-conceived classifications (important to identify emerging skills).

# BIG DATA LMI: FOCUS ON OJV

## KEY FEATURES

- Data collected from the web, based on feasibility analysis (landscaping)
- 5 Vs of Big Data
- Data management flow: landscaping, ingestion, processing, extraction, ETL, presentation
- Several data quality steps and tools
- Data classification: a) AI-aided – with human in the loop; b) International classifications & taxonomies
- ISCED, ISCO, ESCO, NACE; CEN-CENELEC, Stackoverflow, GitHub; ETF green skills
- Big Data: complements conventional statistics (“*Trusted Smart Statistics*”) – points topics and issues for further / wider analysis





# THANK YOU

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