Welcome to the conversation

2 conversations: 14 and 16 February
09.00 – 13.00

Main themes
- Big Data for LMIS: skills demand analysis
- Combination and comparison of OJV data with traditional data
- AI and education
- Occupational profiles: developing and testing a data driven approach based on Big Data

Speakers
- Mauro Pelucchi
- Anna Gatti
- Emilio Colombo
- Fabio Mercoriorio
- Elena Magrini
Getting acquainted

Mentimeter 14/Feb – Webinar Big Data for LMIS

Menti.com – Code: 6130 8707

https://www.menti.com/al77e8puecdj
The journey of Big Data LMIS ETF project

- 6 countries: Egypt, Morocco, Tunisia, Kenya; Ukraine, Georgia
- 3 languages of dashboards: EN-FR-AR
- 5 training programs
- 45 pedagogic videos on YouTube channel
- Over 12.3 million OJV collected
- New analyses: green skills, digital skills, remote work, supply side
Starting from the end…

The value added of Big Data for LMI:
• Volume, velocity, variety
• Real-time
• Granularity
• Combinable
• International classifications
• Early spotting of new trends – for further deeper and wider analysis (combining other data sources)
• “Let the Data Speak”

Challenges exist
Big Data for Labour Market and Skills Intelligence

Big Data Era

Data Torrent + AI algorithms = Computing Anytime, Anywhere
Large volumes of data from employers’ job vacancies online: new source and value added for Labour Market and Skills Intelligence
THE GOAL OF Online Job Vacancy ANALYSIS IS…

To transform this…

…into value
1. Data from OJV Complements statistics
2. AI-aided data system
3. International Classifications ESCO, ISCO, NACE...
4. Visualisation Dashboard - variables
5. Let the data speak
6. Volume, Velocity, Variety, Veracity, Value

OJV analysis system: building blocks
Big Data for LMI - OJV DATA

• Experimental project – data production system based on internet data
• Started: 2019 (Handbook)
• Data science expertise: Lightcast.
• Data: constant inflow; updates: monthly
• 12,5 million OJV collected in the Database

Countries in ETF Database & dashboards:
• Ukraine
• Tunisia
• Georgia
• Kenya
• Egypt
• Morocco

All country Dashboards at:
https://solutions.lightcast.io/?pc=x$fhADtD*cu$BjY9


Standard variables on ETF dashboards - Analysis by:
• Occupation
• Occupation – education
• Occupation – industry
• Industry
• Occupation to skill (ESCO)
• Occupation to skill (O*Net)
• Location – language
• Professional dashboard
• New: green skills, digital skills

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DATA FLOW

Ingestion
- Data Ingestion

Processing
- Pre-Processing
- Information Extraction

ETL

Front end
- Presentation Area

Landscaping and assessing OJV sources in given labour market
Interactive presentation of results – classified OJV data

All country Dashboards at:
https://solutions.lightcast.io/?pc=x$fhADtD*cu$BjY9

Examples
Professional dashboard (all major variables) – Kenya

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

Knowledge
- personal skills and development
- management and administration
- computer use
- wholesale and retail sales
- marketing and advertising
- database and network design
- economics
- work skills
- accounting and taxation
- finance, banking and insurance

Skills
- using digital tools for collaboration
- accessing and analysing data
- coordinating activities
- supervising a team or group
- planning and scheduling
- developing solutions
- complying with legal and regulatory requirements

Transversal Skills and Competences
- demonstrating willingness to work efficiently
- leading others in developing solutions
- supporting others with digital devices
- maintaining a positive attitude
- working with numbers
- supporting others in health-related tasks

Experience
- No experience
- Up to 1 year
- From 1 to 2 years
- From 2 to 4 years
- From 4 to 6 years
- From 6 to 8 years
- From 8 to 10 years
- Over 10 years
- Not defined

Education
- Primary education
- Lower secondary education
- Upper secondary education
- Post-secondary non-tertiary education
- Short-cycle tertiary education
- Bachelor or equivalent
- Master or equivalent
- Doctoral or equivalent
- Not defined

Contract
- Self employment: 1.78%
- Not defined: 85.58%

Working hours
- Full time: 43.07%
- Part time: 19.59%

If you want, you can filter by occupation family:

Select the Occupation that you want to Analyze (then select it again to reset your choice):
- Advertising and marketing professionals
- Research and development managers
- Accountants
- Administrative and executive secretaries

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Not defined 37.34%
Professional dashboard - Egypt

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

- Software developers: 43,307
- Engineering professionals not elsewhere classified: 35,690
- Advertising and marketing professionals: 34,695
- Accountants: 28,771

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

- December 2020: 653,165
- December 2021: 5,050
- December 2022: 5,050
- December 2023: 5,050

Knowledge
- Personal skills and development
- Management and administration
- Computer use
- Wholesale and retail sales
- Database and network design
- Marketing and advertising
- Work skills
- Software and applications

Skills
- Using digital tools for collating data
- Accessing and analysing data
- Coordinating activities
- Developing solutions
- Planning and scheduling
- Managing and analysing
- Performing general clerical work
- Providing general assistance

Transversal Skills and Competences
- Demonstrating willingness to work efficiently, collaborating in teams
- Taking a proactive approach to processing information
- Maintaining a positive attitude
- Communicating effectively
- Leading others
- Planning and organizing work
- Thinking creatively
- Working with numbers
- Working with digital devices
- Supporting others
- Applying health-related skills
- Following ethical code

Experience
- No experience: 30.46%
- Up to 1 year: 19.3%
- 2 to 4 years: 6.5%
- 4 to 6 years: 1.93%
- 6 to 8 years: 3.94%
- 8 to 10 years: 14.61%
- Over 10 years: 32.56%
- Not defined: 0%

Education
- Primary education: 0.44%
- Lower secondary education: 11.75%
- Upper secondary education: 32.78%
- Post-secondary non-tertiary education: 34.97%
- Short-cycle tertiary education: 3.94%
- Bachelor or equivalent: 14.61%
- Master or equivalent: 4.53%
- Doctoral or equivalent: 4.53%
- Not defined: 0%

Contract
- Self employment: 0.20%
- Not defined: 79.29%

Working hours
- Full time: 47.85%
- Part time: 6.85%
Remote work - Ukraine

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 choice):
- Mathematicians, actuaries...
- Trade brokers
- Data entry clerks
- Contact centre information...
- Enquiry clerks
- Information and communi...
- Visual artists
- Database and network pr...
- Information and communi...
- Software developers
- Managing directors and c...
- Film, stage and related dir...
- Mining engineers, metallu...
- Web and multimedia deve...
- Journalists
- Authors and related write...
- Applications programmers
- Information technology tr...
- Contact centre salesperso...
- Well drillers and borers an...
- Medical and pathology lab...
- Clearing and forwarding a...
- Travel consultants and cle...
- Typists and word processi...
- Electrical engineers

Share of remote work by region

Share of remote work by industry
- Information and communica...
- Financial and insurance ac...
- Professional, scientific an...
- Public administration and ...
- Administrative and suppor...
- Arts, entertainment and re...
- Education
- Real estate activities
- Wholesale and retail trad...
- Electricity, gas, steam an...
- Other service activities
- Transportation and stora...
- Manufacturing
- Construction
- Mining and quarrying
- Human health and social...

Share of remote work by release date
GREEN SKILLS
IN ETF OJV DATA
18x369]ETF project: Online job vacancy – Big data for LMI

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)

<table>
<thead>
<tr>
<th>Country</th>
<th>Green skills share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>0.19%</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1.06%</td>
</tr>
<tr>
<td>Georgia</td>
<td>0.47%</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.87%</td>
</tr>
<tr>
<td>Kenya</td>
<td>2.87%</td>
</tr>
<tr>
<td>Morocco</td>
<td>1.08%</td>
</tr>
</tbody>
</table>

Green skills share - data updated until 31/12/2023

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Green Share

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

- Sustainable energy
- Sustainable economy
- Environment and sustainability
- Sustainable agriculture
- Sustainable production
- Sustainable transport
- Sustainable construction

Share of green skill by region

- Aquaculture and fisheries: 0.19%
- Environmental engineers: 0.04%
- Environmental protection: 0.02%
- Metal production process: 0.00%
- Bicycle and related repair: 0.00%
- Mobile farm and forestry: 0.00%
- Ships, A/V engineering: 0.00%
- Refuse sorters: 0.00%
- Meteorologists: 0.00%
- Mixed crop and animal production: 0.00%
- Agricultural and forestry: 0.00%
- Power production plant: 0.00%
- Building caretakers: 0.00%

Share of green skill by occupation

- Electricity, gas, steam and air conditioning: 10.00%
- Water supply, sewerage and waste management: 10.00%
- Construction: 10.00%
- Agriculture, forestry and fishing: 10.00%
- Manufacturing: 10.00%
- Professional, scientific and technical: 10.00%
- Wholesale and retail trade: 10.00%
- Human health and social work: 10.00%
- Administrative and support: 10.00%
- Financial and insurance activities: 10.00%
- Information and communication: 10.00%
- Public administration and defense: 10.00%
- Real estate activities: 10.00%

Share of green skill by industry

- Sustainability and business development: 1.02%
- Renewable energy: 1.02%
- Environment and waste management: 0.87%
- Investments: 0.87%
- Energy efficiency: 1.06%
- Energy conservation: 1.06%
- Energy storage: 1.08%
- Sustainable agriculture and food: 1.08%
- Sustainable tourism: 0.87%
- Sustainable transport: 0.87%
- Sustainable energy: 2.57%

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Select Release Date

- October 2022
- December 2023

ETF - Big Data LMI - Green Dashboard by Lightcast
KENYA ETF Webinar - Big Data for LMIS, 14/02/2024
## Top 20 Green Skills Kenya

<table>
<thead>
<tr>
<th>Skills / skill set</th>
<th>% (from 20)</th>
<th>Nº unique job postings</th>
</tr>
</thead>
<tbody>
<tr>
<td>renewable energy</td>
<td>22,95%</td>
<td>2,598</td>
</tr>
<tr>
<td>agroforestry</td>
<td>9,08%</td>
<td>1,028</td>
</tr>
<tr>
<td>clean energy</td>
<td>6,54%</td>
<td>740</td>
</tr>
<tr>
<td>sustainable business</td>
<td>6,47%</td>
<td>732</td>
</tr>
<tr>
<td>solar energy</td>
<td>6,27%</td>
<td>710</td>
</tr>
<tr>
<td>circular economy</td>
<td>5,64%</td>
<td>638</td>
</tr>
<tr>
<td>environmental sustainability</td>
<td>5,48%</td>
<td>620</td>
</tr>
<tr>
<td>development economics</td>
<td>5,05%</td>
<td>572</td>
</tr>
<tr>
<td>biomass</td>
<td>4,22%</td>
<td>478</td>
</tr>
<tr>
<td>solar systems</td>
<td>3,45%</td>
<td>390</td>
</tr>
<tr>
<td>environmental protection</td>
<td>3,41%</td>
<td>386</td>
</tr>
<tr>
<td>energy efficiency</td>
<td>3,41%</td>
<td>386</td>
</tr>
<tr>
<td>sustainable energy</td>
<td>3,38%</td>
<td>382</td>
</tr>
<tr>
<td>sustainable agriculture</td>
<td>2,99%</td>
<td>338</td>
</tr>
<tr>
<td>climate smart agriculture</td>
<td>2,54%</td>
<td>288</td>
</tr>
<tr>
<td>green energy</td>
<td>2,31%</td>
<td>262</td>
</tr>
<tr>
<td>iso 14001</td>
<td>2,19%</td>
<td>248</td>
</tr>
<tr>
<td>agroecology</td>
<td>1,80%</td>
<td>204</td>
</tr>
<tr>
<td>solar products</td>
<td>1,63%</td>
<td>184</td>
</tr>
<tr>
<td>electric vehicle</td>
<td>1,18%</td>
<td>134</td>
</tr>
<tr>
<td>Occupation</td>
<td>Green skill</td>
<td>Unique Job postings (Oct 22 - Jul 23)</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Electronics mechanics and servicers</td>
<td>solar panels</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>solar energy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>environmental protection</td>
<td>2</td>
</tr>
<tr>
<td>Environmental engineers</td>
<td>environmental sustainability</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>environmental protection</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>sustainable procurement</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>renewable energy</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>sustainable business</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>energy efficiency</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>sustainable energy</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>circular economy</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>development economics</td>
<td>3</td>
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<tr>
<td></td>
<td>climate smart agriculture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>green energy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ecotourism</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>clean energy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>carbon footprint reduction</td>
<td>2</td>
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<tr>
<td></td>
<td>sustainable agriculture</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>sustainability performance</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>iso 14001</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>hydroponics</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>clean technology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>agroforestry</td>
<td>1</td>
</tr>
<tr>
<td>Metal production process controllers</td>
<td>iso 14001</td>
<td>2</td>
</tr>
<tr>
<td>Statistical, mathematical and related associate professionals</td>
<td>environmental protection</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>clean energy</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>energy efficiency</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>green building</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>sustainable materials</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>sustainable building</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>sustainable agriculture</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>renewable energy</td>
<td>5</td>
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<tr>
<td></td>
<td>circular economy</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>biomass</td>
<td>4</td>
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<tr>
<td></td>
<td>agroforestry</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>sustainable energy</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>hydropower</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>biofuels</td>
<td>1</td>
</tr>
</tbody>
</table>
Digital skills – overview of some features of demand

Analysis based on ETF data OJV - Egypt
ESCO: 1,100 digital skills terms

Other sources of digital skills terms: Stackoverflow and Git-Hub – to ease classification
<table>
<thead>
<tr>
<th>Digital skill</th>
<th>Unique Job postings (Oct 22-Jul 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>use microsoft office</td>
<td>21,2% 133.629</td>
</tr>
<tr>
<td>have computer literacy</td>
<td>19,2% 121.093</td>
</tr>
<tr>
<td>office software</td>
<td>7,6%  47.684</td>
</tr>
<tr>
<td>database</td>
<td>5,7%  35.886</td>
</tr>
<tr>
<td>use spreadsheets software</td>
<td>5,4%  33.935</td>
</tr>
<tr>
<td>computer programming</td>
<td>5,4%  33.775</td>
</tr>
<tr>
<td>business ICT systems</td>
<td>4,0%  25.000</td>
</tr>
<tr>
<td>perform data analysis</td>
<td>3,8%  24.040</td>
</tr>
<tr>
<td>online analytical processing</td>
<td>3,5%  21.879</td>
</tr>
<tr>
<td>process data</td>
<td>3,2%  19.941</td>
</tr>
<tr>
<td>social media marketing techniques</td>
<td>3,0%  19.083</td>
</tr>
<tr>
<td>use communication and collaboration software</td>
<td>2,9%  18.554</td>
</tr>
<tr>
<td>use word processing software</td>
<td>2,6%  16.306</td>
</tr>
<tr>
<td>analyse software specifications</td>
<td>2,3%  14.409</td>
</tr>
<tr>
<td>digital marketing techniques</td>
<td>2,0%  12.549</td>
</tr>
<tr>
<td>use creative suite software</td>
<td>1,9%  11.825</td>
</tr>
<tr>
<td>use software design patterns</td>
<td>1,7%  10.686</td>
</tr>
<tr>
<td>computer science</td>
<td>1,7%  10.611</td>
</tr>
<tr>
<td>use object-oriented programming</td>
<td>1,5%  9.463</td>
</tr>
<tr>
<td>administer ICT system</td>
<td>1,5%  9.337</td>
</tr>
<tr>
<td>Skill</td>
<td>Percentage</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Have computer literacy</td>
<td>16.06%</td>
</tr>
<tr>
<td>Use Microsoft Office</td>
<td>14.51%</td>
</tr>
<tr>
<td>Use Office Systems</td>
<td>7.18%</td>
</tr>
<tr>
<td>Enterprise Resource Planning</td>
<td>6.63%</td>
</tr>
<tr>
<td>Computer programming</td>
<td>6.43%</td>
</tr>
<tr>
<td>Use Spreadsheets Software</td>
<td>5.58%</td>
</tr>
<tr>
<td>Database</td>
<td>5.56%</td>
</tr>
<tr>
<td>Business ICT systems</td>
<td>5.08%</td>
</tr>
<tr>
<td>Analyse software specifications</td>
<td>3.14%</td>
</tr>
<tr>
<td>Process data</td>
<td>3.05%</td>
</tr>
<tr>
<td>Use communication and collaboration software</td>
<td>2.66%</td>
</tr>
<tr>
<td>SQL</td>
<td>2.37%</td>
</tr>
<tr>
<td>Java (computer programming)</td>
<td>2.29%</td>
</tr>
<tr>
<td>Use object-oriented programming</td>
<td>2.08%</td>
</tr>
<tr>
<td>Social media marketing techniques</td>
<td>2.04%</td>
</tr>
<tr>
<td>Use Creative Suite Software</td>
<td>2.03%</td>
</tr>
<tr>
<td>Analytics</td>
<td>2.01%</td>
</tr>
<tr>
<td>Unified modelling language</td>
<td>1.87%</td>
</tr>
<tr>
<td>Web programming</td>
<td>1.87%</td>
</tr>
<tr>
<td>Use Word processing software</td>
<td>1.87%</td>
</tr>
</tbody>
</table>
AI SKILLS: UNIQUE JOB POSTINGS

Source: ETF Job Postings – Egypt – Lightcast AI Skills list

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AI SKILLS: TOP SKILLS IN OJV

- Machine Learning: 479
- Artificial Intelligence: 260
- Computer Vision: 126
- Deep Learning: 117
- Chatbot: 85
- Image Processing: 47
- Recommender Systems: 43
- Machine Learning Algorithms: 35
- Path Analysis: 30
- Machine Translation: 23

Source: ETF Job Postings – Egypt – Lightcast AI Skills list

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## DIGITAL SKILLS: IN DIGITAL AND NON-DIGITAL OCCUPATIONS

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

New initiatives using our database, other data sources and ESCO - 2024

- Occupational profiles – data driven, ESCO-based (ACQF-II – for common profiles of qualifications)
- Demand for green skills – data driven, ESCO-based - report
- Demand for digital skills - report
- Supply side – social profiles (ESCO Skills)
- Combination of data (OJV, conventional statistics, administrative)
1. Value of OJV data

- **Near real-time data**
- **Volume**: allows different angles of analysis on skills and occupations; granularity
- **Finder!** Early spotting of new skills / new patterns of skills mix (digital, soft, technical, green…). For further analysis in combination with conventional statistical and other data sources

- **Green and digital transition**: Identification of demanded skills; quantitative trends over time – by occupations and sectors; green and digital skills profiles of occupations; AI skills and occupations; and setting up international benchmarking / comparisons.
  - Identification of **green jobs** in high demand; lead industries and regions in green job creation; qualifications for green jobs
  - The evolution of the **digital skills** and new emerging occupations; growth in jobs requiring new knowledge & skills.

- **Value-added to LMI and skills development policies and practices**: emerging trends in LM and skills; inform policy responses;

2. Limitations

- Over-representation of certain occupational groups (professionals – 55%); underrepresentation (in general occupations requiring lower level of skills and qualifications).
- Classification of OJV data: robust techniques, constant evolution, taxonomies in transformation.
Thank you

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ANNEX: for reference and further reading (not presentation)
ETF project

Big Data for LMI 2018-2024


- **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

- 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
Digital skills

Ability to use digital technologies confidently, critically and responsibly and engage with them for learning, at work and for participation in society.

It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including coding), security (including digital wellbeing and cybersecurity-related skills), intellectual property issues, problem-solving and critical thinking.
Green skills – an important area of debate and policy action and which has become a priority in research (quantitative and qualitative) and social communication. Several international organisations are working on the analysis and taxonomies related to green competences.

Cedefop defines green skills as "the knowledge, skills, values and attitudes needed to live, work and act in economies and societies that seek to reduce the impact of human activity on the environment".

Skills for the green economy consist of:

- **Transversal skills**, linked to sustainable thinking and acting, relevant to all economic sectors and professions;
- **Specific skills** needed to adapt or implement standards, processes and services to protect ecosystems and biodiversity and reduce energy, materials and water consumption;
- **Highly specialised skills** needed to develop and implement green technologies such as renewable energy, wastewater treatment or recycling;

Skills for the green economy are also referred to as skills for green jobs, skills for the green transition or green skills.
ETF green skills list
- 225 terms (data-driven identification) – now integrated in ESCO
- 7 clusters of sustainable activity (inspired by the European Green Deal)
THANK YOU

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