DIGITAL DATA FOR DEVELOPMENT WORKSHOP

How LinkedIn data can inform World Bank operations – Global Results & Egypt Highlights

Juni Tingting Zhu (Private Sector Development Specialist)
Washington, D.C., November 2019
Informing WB Diagnostics & Operation Design with LinkedIn Data

Challenge
Design data-driven policies and interventions, whereby traditional government surveys based on low-frequency and rigid taxonomies that fail to capture the latest industry, skills and occupations trends.

Value of LinkedIn Data
Detailed and global coverage in the fastest-emerging (tech) industries, jobs, and occupations.

LinkedIn Data can inform Diagnostics & Operations Design, for example in:

- **Digital Economy Country Assessment (DECA)**
  - Use: Identification of emerging industries, digital jobs, and digital skills.
  - Value: Better-informed prioritization of workforce and entrepreneurship training investments to ensure countries have the relevant skills to accelerate the growth of the digital economy.

- **Industry 4.0 Assessment**
  - Use: Monitoring of the penetration and diffusion of frontier tech in the economy, across industries and occupations.
  - Value: Identification of key technology adopted and re-skilling opportunities for Industry 4.0 transformation.
In 2017, LinkedIn and the World Bank entered into a multi-year agreement to develop new insights for policymakers.
645+M members on LinkedIn across the globe

30M companies
20M open jobs
35K skills
90K schools on member profiles
LinkedIn uses algorithms and data science to transform member work history, education, and skills into labor market insights.
There are currently 13,000 occupations* captured on LinkedIn that use at least one type of digital skill. While certain occupations only require light digital skills (e.g. digital literacy, social media for curriculum specialist and traffic officer), some occupations can be classified as digital intense (e.g. iOS Developer, Hardware Networking Engineers) and the digital skills required by these occupations are more diverse and complex. This has implications on the workforce training designs for WB projects.

### Quartile Breakdown of Digital Occupations by Digital Skill Application Intensity

<table>
<thead>
<tr>
<th>Less digital intense occupations</th>
<th>Most digital intense occupations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top 5 Digital Occupations in Q1:</strong></td>
<td><strong>Top 5 Digital Occupations in Q4:</strong></td>
</tr>
<tr>
<td>- Curriculum Specialist</td>
<td>- Hardware Networking Engineer</td>
</tr>
<tr>
<td>- Head of Internal Control</td>
<td>- Data center Analyst</td>
</tr>
<tr>
<td>- New Business Developer</td>
<td>- Software Engineer</td>
</tr>
<tr>
<td>- Traffic Officer</td>
<td>- Network Infrastructure Engineer</td>
</tr>
<tr>
<td>- Supplier Quality Assurance</td>
<td>- Research Programmer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top digital skills used by the occupations in Quartile 1:</strong></td>
<td><strong>Additional top digital skills used by the occupations in Q2</strong></td>
<td><strong>Additional top digital skills used by the occupations in Q3</strong></td>
<td><strong>Additional top digital skills used by the occupations in Q4</strong></td>
</tr>
<tr>
<td>- Digital Literacy</td>
<td>- Graphic Design</td>
<td>- Development Tools (eg. R, Python)</td>
<td>- Computer Networking</td>
</tr>
<tr>
<td>- Social Media</td>
<td>- Technical Support</td>
<td>- Data Storage Technologies</td>
<td>- Software Development Life Cycle (SDLC)</td>
</tr>
<tr>
<td>- Data Science</td>
<td>- Enterprise Software</td>
<td>- Web Development</td>
<td>- Software Testing</td>
</tr>
</tbody>
</table>

* n=13,096 occupations are studied in this slide.
Globally, digital literacy penetration is relatively evenly distributed among professionals in both developing and developed countries.

Digital Literacy Penetration Relative to Global Average Digital Literacy Penetration among same occupations, 2018

Note: Blank means either LinkedIn does not operate in this country or there is zero number of occupations reporting using this skill in the country. This map shows data for 140 countries that LinkedIn operates in and have at least 100,000 members as of 2018. Skills penetration was based on LinkedIn members’ self-reported skills that are associated with their jobs as reported on their profiles. Note that there are some cultural and gender differences when people choose to over- or under-report skills online, which explains some country differences here.
But frontier tech, such as AI skill penetration in daily jobs is still heavily tilted towards OECD and a few large middle income countries.

Artificial Intelligence Skill Penetration Relative to Global Average AI Penetration among same occupations, 2018

Note: Blank means either LinkedIn does not operate in this country or there is zero number of occupations reporting using this skill in the country. This map shows data for 140 countries that LinkedIn operates in and have at least 100,000 members as of 2018. Skills penetration was based on LinkedIn members’ self-reported skills that are associated with their jobs as reported on their profiles. Note that there are some cultural and gender differences when people choose to over- or under-report skills online, which explains some country differences here.
Same as in other frontier tech skill\* penetration in daily jobs -- OECD and large middle income countries are the winners

Sum of Frontier Skill Penetration Relative to Global Average Frontier skill Penetration among same occupations, 2018

*All frontier tech skills captured by LinkedIn data: Artificial Intelligence, Robotics, Genetic Engineering, Aerospace Engineering, Cloud Computing, Human Computer Interaction, Cyber-security, Nanotechnology, Data Science, Development Tools (e.g. Python, Linux, C#), Materials Science. We can evaluate for each country how each of these frontier tech skills is penetrated to jobs.

Note: Blank means either LinkedIn does not operate in this country or there is zero number of occupations reporting using this skill in the country. This map shows data for 140 countries that LinkedIn operates in and have at least 100,000 members as of 2018. Skills penetration was based on LinkedIn members’ self-reported skills that are associated with their jobs as reported on their profiles. Note that there are some cultural and gender differences when people choose to over- or under-report skills on social media platforms, which explains some country differences here.
LinkedIn Members in Egypt tend to be young, male, highly educated when compared with national statistics

In 2018, Egypt had ~4M members (14% of Workforce, based on Egypt’s Official Statistics)


For more information on LinkedIn data sample size and representativeness in your country, please review the Methodology Paper and/or please email Mar Carpanelli: mcarpanelli@linkedin.com and Juni Zhu: tzhu@worldbank.org
Egypt already has a relatively good penetration in basic digital skills: Out of the 2049 occupations listed on LinkedIn Egypt, over 75% report digital literacy skill is being used in their jobs. However, by contrast, a much smaller share of occupations list Disruptive Tech Skills.

* Development tool includes mostly different programming languages, such as C, Linux, Java.
And the growth of frontier tech skills is still lagging behind basic digital skills growth in Egypt.

Source:
WBG - LinkedIn Country-Occupation-Skill Data (upon request)
& Official WBG Use - Country Skill Time Series
Between 2015-2018, Egypt is net loosing these disruptive skills. With AI departing at the fastest rate of all frontier skills, on the other hand Egypt is net attracting Genetic Engineering & Nanotechnology talent.

Note: This exercise can be replicated for all the 10,000 occupations captured by LinkedIn.