Updating occupational classifications using machine learning:

Context and the modernization of ISCO

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ISCO revision: the current practice

Conducted in a 20-year cycle since ISCO-68

- Requested/ Mandated by the ICLS
- Facilitated by the office with the assistance of a working group

The current revision of ISCO follows the same practice

- Requested by the 20th ICLS, to be completed on time for 2030 round of housing and population censuses
- TWG: Governments, employers, workers and observers
- Information and data sources used in revising ISCO
  - TWG: advice, experience and proposals for improvement,
  - Recently updated NOCs,
  - Literature review, analysis of available information/data,
  - Ad-hoc consultations with experts and working groups,
  - Etc,
ISCO revision: the current practice

- **Strength, such as:**
  - Stability of the classification over a long period of time (less break in series)
  - Requires less resources for implementation/adaptation at national level
  - Input from the TWG (various countries, regions of the world, different labour markets, etc)

- **Limitations, such as:**
  - No maintenance is undertaken between major consecutive revisions
  - No (systematic) guidance is provided to users e.g., how to treat new and emerging occupations
  - (Re) source dependent
  - Lengthy process
ISCO revision: consequences of the current practice

No systematic treatment: Countries identify different solutions

<table>
<thead>
<tr>
<th>Country</th>
<th>ISCO code used by countries to code Youtuber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country 1</td>
<td>Coded within 2513 Web and Multimedia Developers</td>
</tr>
<tr>
<td>Country 2</td>
<td>Coded within 2432 Public Relations Professionals</td>
</tr>
<tr>
<td>Country 3</td>
<td>Coded within 2641 Authors and Related Writers</td>
</tr>
<tr>
<td>Country 4</td>
<td>Coded within a different group within major group 3</td>
</tr>
</tbody>
</table>

Based on information collected during initial consultations within the TWG

Hamper international comparability of statistics on occupations, impact on many countries

- Classification to code information on occupations (n. of countries)
  - NOC different from ISCO, 14
  - Previous version of ISCO or NOC aligned with it, 10
  - ISCO-08/ NOC based on it, 101

Questioning the relevance of this practice and some aspects of ISCO, in light of the:

- Major transformation in the world of work
- Emergence of new occupations
- Rapid technological change
- Recent practices
- Artificial Intelligence (AI)
- Data availability

Source: Survey on country practice review, ILO 2023 (n: 125)
The modernization of ISCO

Targeted periodic updates and maintenance
- Adopting a pro-active ISCO maintenance process
  - Aiming at:
    - incorporating NEO,
    - Improving/ developing group descriptions (typical tasks),
    - providing systematic guidance to ILO constituents
  - Between major revisions (long term)

Long term major revision
- Requiring structural changes, i.e., conceptual framework, core principle, boundaries between groups or skill levels, etc

Impact
- Relevance of the classification
- Mirror the reality of the labour market
- Maintain international comparability of statistics on occupations
- Contribute to improving analysis and policy-making based on ISCO (statistics on occupations, labour migration, etc.)
- Assist countries in planning and anticipating changes
- Synchronized revision cycles

Strong support and interest by delegates
Practices worldwide

• Country level
  • Different revision practices are observed across countries
    • Short-term: Evergreen process (yearly update), e.g., Canada NOC
    • Mid/long-term (5-10 years), e.g., Singapore SSOC, UK SOC, US SOC, Korea SOC, etc.
    • Follow the ISCO revision cycle

• Regional/International levels (other classifications)
  • Many are (or will be) updated more frequently, such as

ILO Survey of country practice review, in preparation for the 21st ICLS

Any process in place to adapt/revise your NOC? (n: 126)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36.4%</td>
<td>43.2%</td>
<td>20.3%</td>
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</table>

72.1% (or 31 countries)

Have a future plans to revise/update the NOC? (n: 31)

• year known?

<table>
<thead>
<tr>
<th>Year/ time frame</th>
<th>Number of countries</th>
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<tbody>
<tr>
<td>Started</td>
<td>5</td>
</tr>
<tr>
<td>2023</td>
<td>4</td>
</tr>
<tr>
<td>2024</td>
<td>7</td>
</tr>
<tr>
<td>2025</td>
<td>3</td>
</tr>
<tr>
<td>2026</td>
<td>2</td>
</tr>
<tr>
<td>2028</td>
<td>2</td>
</tr>
<tr>
<td>5-year plan</td>
<td>1</td>
</tr>
<tr>
<td>Following ISCO revision</td>
<td>3</td>
</tr>
<tr>
<td>Not defined</td>
<td>2</td>
</tr>
<tr>
<td>On necessity</td>
<td>2</td>
</tr>
</tbody>
</table>
The modernization of ISCO

Information and data sources used in revising ISCO

• Recently updated NOCs: a challenge?

Explore additional sources and methods to maintain ISCO updated in the future?
• Opportunities: technological advancement in availability of data from various sources

Proposed approach for the modernization of the current process

• Leveraging new technologies and various data sources
  • To complement existing sources of information

How?

• Proof of Concept (PoC): Feasibility study on identifying NEO candidates using data from OJA to support the future ISCO revision

• Pilot tests for sustainable industry solutions: leveraging advanced AI technologies such as ChatGPT and Azure ML Cloud, and coupling with new data acquired through collaborations with the private sector, by the office
Practices worldwide

The use of Machine Learning/ data from OJA in Occupational Classifications, few examples:

Updating/ maintaining occupation classification (of features of it, such as skills)

- Chile (dedicated presentation on the topic by David Niculcar- INE)
- ESCO: The use of artificial intelligence in updating the ESCO, using ML and OJA

Use of OJA in similar or related activities

- ILO work on skills using OJA in anticipating and matching skills needs
- UNESCWA Job/ skills monitor
Thank you