LMiCiMT LABOUR MARKET INFORMATION COUNCIL
CONSEIL DE L'INFORMATION SUR LE MARCHÉ DU TRAVAIL

# Enhancing Skills Data in Canada

## Connecting "big data" with traditional sources of LMI

International Labour Organisation, Skills and Employability Branch

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1 Who we are

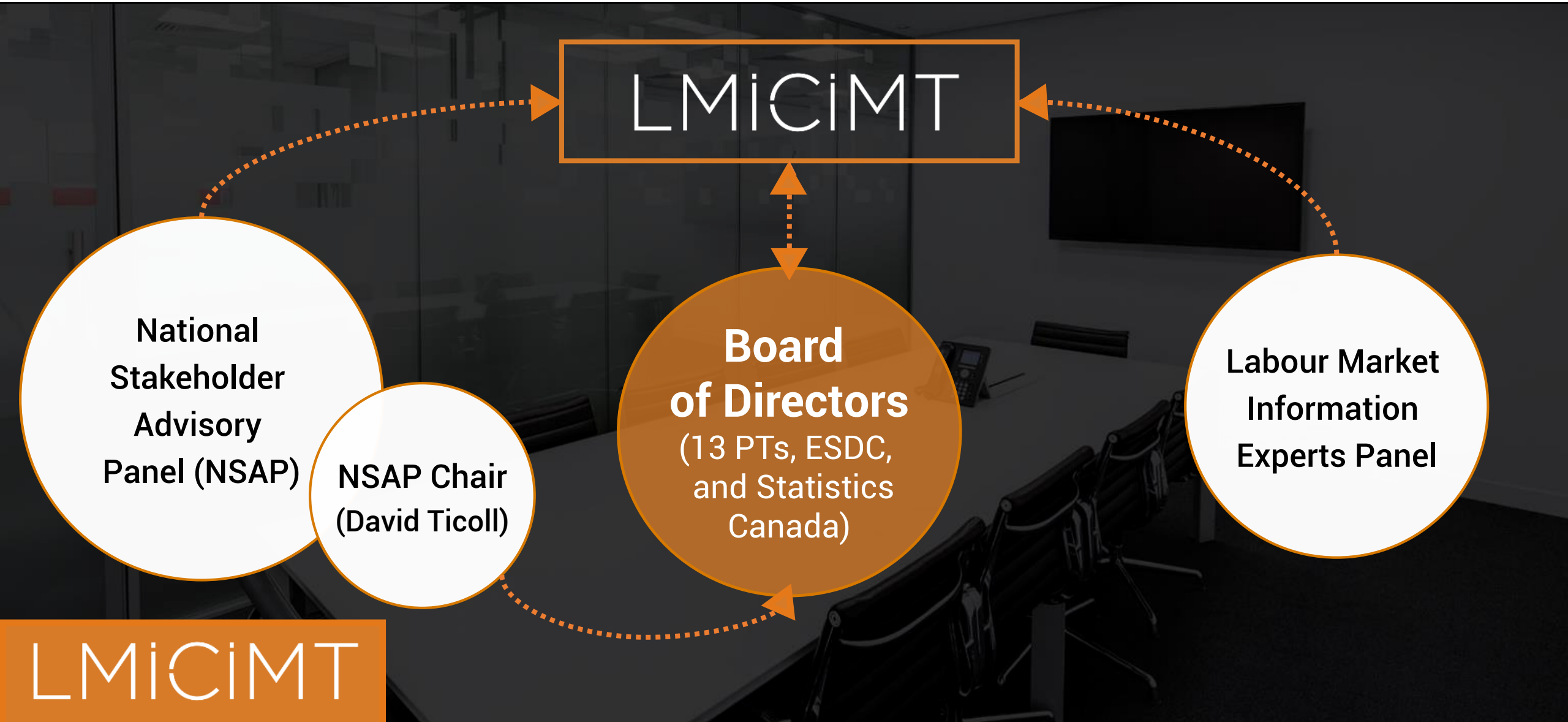
2 Motivation and objective

3 Approaches for mapping skills to occupations

4 Challenges

5 Conclusion

# Who We Are


LMiCiMT
National Stakeholder Advisory Panel (NSAP)
NSAP Chair (David Ticoll)
Board of Directors (13 PTs, ESDC, and Statistics Canada)
Labour Market Information Experts Panel
LMiCiMT

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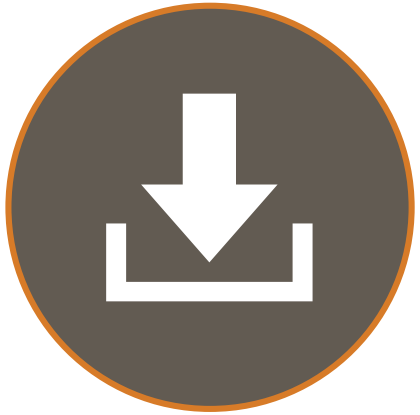
# Bridging the gap between skills and occupations

## COLLECT

**Skills data gap identified**

- Education level/type used as proxy



## ANALYZE

**Linking skills to occupations**

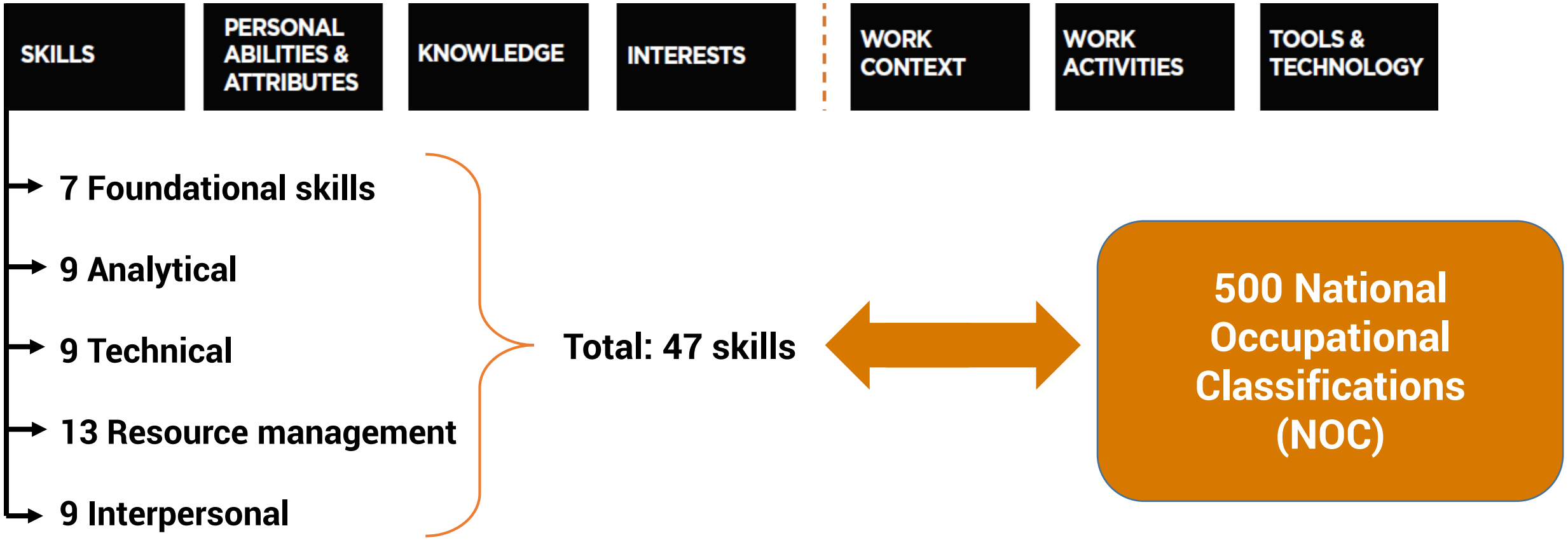
- Learning from others (O*NET, ESCO)
- Exploring new techniques with big data

## DISTRIBUTE

**Will publish data and analyses**

- LFS data linked to skills and downloadable
- Report methodological details and ongoing updates

# A Canadian Skills and Competencies Taxonomy



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# A phased approach

1. Consult & improve the Taxonomy
2. Identify and evaluate mapping approaches
3. Pilot tests
4. Assess and validate tests
5. Disseminate, administer, and implement

# Mapping to be guided by 7 Criteria

| Criteria | Description |
|---|---|
| **Flexible** | Responds to changing labour market conditions and captures emerging skills. |
| **Sustainable and cost effective** | Adequate resources to maintain and update the mapping |
| **Representative** | Reflects the different ways people express skill requirements |
| **Granular** | Greater specificity of skills and occupation-specific data |
| **Responsive** | Enables better informed decisions about skills training and education |
| **Measurable** | Allows for reasonable measurement of skills |
| **Statistically sound** | Estimated skill levels representative of labour markets |

# Mapping approaches being explored

| Potential Approaches | Examples | Advantages | Drawbacks |
|---|---|---|---|
| **Consult occupational experts** | O*NET | • High quality linkages to well-defined skills taxonomy<br>• Standardized review process ensures consistency | • Slow adaptation to emerging skills<br>• Unnatural skills language |
| **Survey workers directly** | O*NET | • Obtain "front line" knowledge<br>• Linkages to skills taxonomy of choice | • Requires expert vetting / validation<br>• Risk of misunderstanding<br>• Closed vs open-ended questions |
| **Leverage web-scraped data** | Nesta, LinkedIn | • Draws on large pool of data<br>• Natural language in job postings<br>• Responsive to emerging skills<br>• Inexpensive to maintain | • Requires vetting / validation<br>• Skewed market segment<br>• Inconsistency of skills language<br>• Omission of implied skills |
| **Hybrid of the above** | | • Balance natural vs consistent skills language | • Expensive to maintain |

# Nature of Skill-Occupation linkage

**Importance and level ratings (O*NET)**

O*NET: 1 = not important
2 = somewhat important
3 = important
4 = Very important
5 = Extremely important

**Binary classification (ESCO)**

ESCO: "essential" or "non-essential"

**Alternatives?**

# Approach 1: Job analysts

**Example**: O*NET and US SOC codes: 19-3011 ("Economists")

| Skill | | Importance | Level |
|---|---|---|---|
| 1. | Critical thinking | 78 | 64 |
| 2. | Mathematics | 78 | 61 |
| 3. | Reading comprehension | 78 | 68 |
| 4. | Active listening | 75 | 57 |
| 5. | Judgement and decision making | 75 | 57 |
| 6. | Speaking | 75 | 61 |
| 7. | Writing | 75 | 61 |
| 8. | Active learning | 72 | 57 |
| 9. | Complex problem solving | 72 | 59 |

| Skill | | Importance | Level |
|---|---|---|---|
| 10. | Instructing | 63 | 45 |
| 11. | Systems analysis | 60 | 55 |
| 12. | Systems evaluation | 56 | 57 |
| 13. | Learning strategies | 53 | 50 |
| 14. | Monitoring | 53 | 52 |
| 15. | Coordination | 50 | 45 |
| 16. | Persuasion | 50 | 52 |
| 17. | Service orientation | 50 | 41 |
| 18. | Time management | 50 | 43 |

# Approach 1: Considerations

- **Complexity**: Leveraging O*NET taxonomy of skills requires translation into local occupational categories
- **Limited**: O*NET taxonomy is fixed (35 unique skills)
- **Slow responsiveness**: 100 occupations updated per year

# Approach 2: Web scraping

**Example**: Vicinity Jobs NOC code 4162 (Economists, etc.)

| Item | | Type | Incidence |
|---|---|---|---|
| 1. | Communication skills | skill | 53% |
| 2. | Teamwork | skill | 47% |
| 3. | English language | Work requirement | 38% |
| 4. | Forecasting | Work requirement | 34% |
| 5. | Data Analysis | Work requirement | 22% |
| 6. | Decision making | Skill | 19% |
| 7. | EViews | Work requirement | 9% |
| 8. | Writing | Skill | 6% |
| 9. | MATLAB | Work requirement | 3% |

# Approach 2: Considerations

- **Measure**: Incidence in job postings does not equal level of importance or frequency of requirements

- **Complexity**: Translating to rigorous skills taxonomies challenging

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# Challenges to web-scraped skills mapping

- Linking natural language on skills to formal taxonomy
- Distinguishing between “skills” and “work requirements”
- Capturing implicit skills
- Lack of equally comprehensive supply-side data

# Considerations for emerging economies

- How to factor in informal economy
- Online job postings even more skewed/not representative
- Possibility to leverage existing skills taxonomies
- Employment data by occupation less timely and frequent, making it difficult to assess robustness of online postings
- Consider different weighting of various approaches, e.g. job postings given less prominence

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# Conclusion

- Official data sources lack skills information: **education ≠ skills!**
- Online job postings represent a rich new source of information
- Linking skills with occupations enables leveraging of existing labour market information (e.g., LFS, Census)
- Older linkage approaches still relevant, but can be enhanced with new “big data”
- Challenges remain, including representativeness of online data and how to optimally connect the “right” skills taxonomy to occupations

# Questions?


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