TIP @ 50
RESULTS FROM TIP TEXT-MINING ANALYSES

TIP@50: What have we learnt? Where is innovation policy heading?
11 December 2017
Going one step further: Automatic text analysis techniques

• Analysis of text’s contents, properties and characteristics allow not to read the text but to analyse and interpret representations of the information contained in those documents.

• Application of different text-mining tools and techniques aimed at to extracting information from texts (including the digital platform CORTEXT (www.cortex.net) and iFora database and visual interfaces, Taltac and Spad, Iramuteq and visual interfaces.
Going one step further: Automatic text analysis techniques

- **Pre-processing of TIP documents** over 25 years resulting in a total of 116 reports and 160 agendas/summaries

- Presentation reflects *perspectives from 4 teams’ analyses* with own methodologies & tools

- **Words of caution:**
  - Results are dependent on data and methods and explain differences in findings
  - Results are sometimes preliminary and early assessments
  - More detail is available from research teams
Possible **12-13 March** workshop in Paris (back-to-back with CSTP)

**Agenda items:**
- Full presentation of results of the text-mining analysis of the TIP corpus
- How to use semantic analysis for innovation policy (detect trends, analysis, etc.)
- Best practice of semantic analysis (strengths and pitfalls, data quality, etc.)
- “Hands-on” experience of the possibilities of text-mining (and of its limitations)

There is much more to explore
Semantic analysis of 100 TIP reports using the IPP vocabulary

OECD Directorate for Science, Technology and Innovation
Andrés Barreneche, Alina Deniau, Michael Keenan, Blandine Serve

OECD Library and Archives
Frédéric Abrazian, Mary-Ann Grosset, Jan-Anno Schuur, Thierry Vebr
50 Most frequent topics
1994 – 2016
Topics becoming less frequent

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>intellectual property rights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>technology diffusion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>technological development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>technological innovation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>technology transfer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>national innovation systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>venture capital</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Topics becoming **more** frequent

![Bar chart showing the increase in topic presence from 1994-2000, 2001-2008, and 2009-2016.](chart.png)
HINTS ON 50 TIP

UNIMORE INTERPRETS THE TEXTS FROM THE ARCHIVE OF OECD WPTIP’S DOCUMENTS

PRELIMINARY RESULTS

Margherita Russo and Pasquale Pavone
Corpus of texts
lexicon distribution in the factorial plan

reports
workshops & c
plenary

reports
workshops & conferences
plenary meetings
Plenary meetings 1-49
Plenary meetings 1-49
Organizational discourse pivotal words
**TOPICS**

- venture capital
- fiscal measures
- HEIs & research
- KIBS, networking, science park, incubator
- environmental issues
- evaluation, behavioural additionality
- system innovation, RIS3, priority setting, open science, global challenge
- patents

**plenary meetings**

- **1993-96**
  - National System of Innovation
- **1996-01**
  - NSI labour market
- **2001-07**
  - intellectual assets, behavioural additionality
- **2007-14**
  - knowledge network, social challenge
- **2015-17**
  - digital economy, system transformation

**reports**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**workshops & conferences**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**ventures**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**fiscal measures**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**HEIs & research**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**KIBS, networking, science park, incubator**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**environmental issues**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**evaluation, behavioural additionality**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**system innovation, RIS3, priority setting, open science, global challenge**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation

**digital economy, system transformation**

- 1993-96: National System of Innovation
- 1996-01: NSI labour market
- 2001-07: intellectual assets, behavioural additionality
- 2007-14: knowledge network, social challenge
- 2015-17: digital economy, system transformation
Preliminary results of text mining study based on NRU HSE intelligent FOResight Analytics (iFORA) system for OECD Working Party on Innovation and Technology Policy (TIP)

http://issek.hse.ru
http://foresight.hse.ru
https://prognoz2030.hse.ru/

dmeissner@hse.ru
ikuzminov@hse.ru
pbakhtin@hse.ru
Semantic map of OECD TIP topics based on 1993-2017 period

Source: intelligentFOResightAnalytics (iFORA) system (IP owner - NRU HSE ISSEK)
Trend map of OECD TIP topics based on 1993-2017 period

Stable directions

Trends

Frequency of occurrence

Growth rate of occurrence

Niche areas

Weak signals

© NRU HSE. Confidential, for use only in OECD TIP workshop

Source: intelligentFOResightAnalytics (iFORA) system (IP owner - NRU HSE ISSEK)
Structural comparative analysis

1993-2007 topics

2008-2017 topics

© NRU HSE. Confidential, for use only in OECD TIP workshop
Source: intelligentFOResightAnalytics (iFORA) system (IP owner - NRU HSE ISSEK)
Trends comparative analysis

1993-2007 topics

2008-2017 topics

Source: IntelligentFOResightAnalytics (iFORA) system (IP owner - NRU HSE ISSEK)

Philippe Larédo & Antoine Schoen
Two major results:
1) Unequal importance of themes: 5 themes represent 2/3rds of occurrences
2) only 4 areas are equally present over the period, 7 peak in only one period, 2 are nearly absent from one period
An overall view of links: 6 clusters highlighting ‘sub’ policy mixes
Clusters: policy rationales & processes

NSI / market & system failures / Foresight

Governance arrangements

Business R&D / globalisation / Open innovation

SME & tech-based firms

Transformations of innovation processes (open innovation & business models)

Priority setting Impact assessment
Conclusions

- Innovation policy changed substantially over the past 25 years and 49 TIP meetings ...
- ... at the same time as a few themes have remained the same
- Semantic analysis itself and other new tools may mark new explorations of those very themes