GRIPS ICUS EXPLAINED: methods, sources and more

Inno-Grips
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A- Methods and sources

The following explanations are based upon an example, that of the first ICU (September 2008), since a general discussion would not suffice.

1. This ICU is based upon a semantic analysis of about 5 000 articles from international newspapers and specialised journals, collected from July to 15 September 2008. By definition, all results presented are '*as of*' the period concerned.

2. The selection comprises 77 newspapers and journals, 49 of which correspond to newspapers, the rest to sector-specific journals (ex: "Building and construction journal" or "Auto world"). The newspapers are the most important ones of about 20 countries (China, Denmark, France, Germany, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Russia, Spain, Sweden, Swiss, Taiwan, Turkey, UK and the US).

3. The articles were collected because they contain root word: "innovat*".

4. A keyword search in the articles leads to the identification of 110 articles dealing with ageing (or "aging" or "elderly"). Of the latter 110, 66 were found really relevant.

5. The 3 clusters we propose in 'Pattern' are direct extractions from TEMIS' Luxid clustering algorithms. I.e.:
- Documents are transformed into vectors and then manipulated by mathematical methods;
- Method is classic"bag of words" model with semantic extensions, i.e. list of values with frequencies, values can be organized in hierarchies;
- *As analysts*, we have chosen to construct clusters based on proximity of 3 entities: 'common nouns', 'proper nouns' and 'company names' in the various texts. As a consequence of this choice, each cluster is composed of a set of common nouns, proper names and company names.
- The partitioning algorithm with iterative assignments is based on a method which is a variant of 'k-means'. Features weights and vector weights are calculated according to the weighting system selected and the corpus. After iterations, each document is progressively assigned to its best cluster.

6. Clusters are presented without intervention and interpreted by Grips experts according to their meaning, i.e. we gave the cluster their labels. Each cluster contains a series of nouns and a company name. The size of the bubble is proportionate to the number of documents clustered.

7. Selected by Grips experts, spotlights are directed towards the 3 communities of innovation in the form of excerpts from the articles ("Cross-views", "Policymakers in the spotlight").

B. A rationale and readers' guide

1. ICUs use a semantic-based methodology to help policy-makers in thinking unpredictable innovation challenges. The method relies upon three key notions: emergence, structure and robustness. In addition, Grips experts stress potential policy impacts of the innovation initiatives.

<u>Emergence</u>: ICUs are focussing on current moves in innovation communities; they do so to capture signals which reflect emergent innovations aiming at meeting key society challenges. They take worldwide diversity into account. As they are published in pay-journals, the selected articles do reflect current thinking, beliefs and actions made explicit.

<u>Structure</u>: ICUs are aiming at innovation pattern discovery. In a permanent non-equilibrium state, ICUs' clusters are assumed to represent innovation-driven structural adjustments. Indeed, they are based on the semantic proximities lying within and between the selected articles. At a given time, the learning curves of individuals and organisations associated with trajectories, including exotic mechanisms, are made explicit by the clusters.

<u>Robustness</u>: ICUs robustness function is building on emerging innovation communities potential strengths and impacts. ICUs are not predictive. Based on semantic proximity, they simply gather self organisation mechanisms of innovation communities. In so doing it is assumed that involved people make decision and act more or less at random, based on passed experience and culture (bounded rationality), and take advantage of the resulting benefits to develop a tractable model of their interactions through an institution. Then, specialised world press's named agents are potential successful innovation players.

2. Last but not least, Grips experts move on to the next step; they list possible relevant policy tools that could allow the regulation of innovation economics in the discussed field. In an innovation based world, focussing on broad-based innovation is a must: successful innovation is often highly rewarded while failure is severely punished.