

Trans-sector Innovation Framework

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Introduction

Both society and economy are divided into sectors. As networks are omnipresent, sectors can be considered nodes in a sector network. Currently, limited knowledge is available about the sector network architecture as a whole. Today, fragmented orchestration, functional decomposition and nodal focus make it hard to e.g. transfer sector specific concepts, insights and lessons learnt to other sectors. Realisation of trans-sector innovations and optimisations are commonly troubled due to nodal interests, prisoners dilemmas and lack of trust and transparency.

Goal

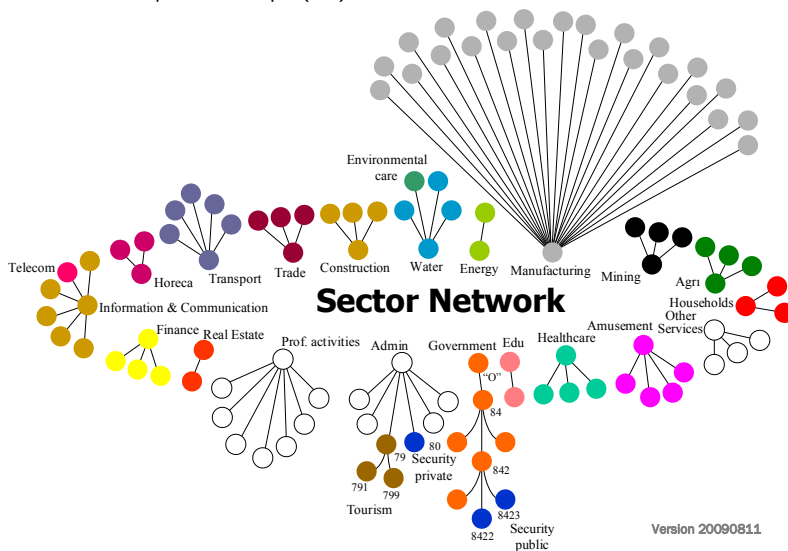
From a network vision, this project aims to contribute to providing a trans-sector innovation framework which currently does not exist. Practically, this project aims to bring up some promising trans-sector innovation ideas.

Methodology

Firstly, a nodal analysis is carried out posing questions like:

- What makes a sector a sector?
- Which sector specific and generic functions can be found?
- Which sectors exist from various viewpoints?
- How are sectors composed?
- Which divisions do sectors comprise and how do they interrelate?

Inventarise, compare and analyse various sector activity classification systems in order to learn about the classification methodologies and the unique value add per (sub)sector.



Secondly, detect & transfer isomorphisms:

Taking e.g. uploading of personal content to the Internet in mind, an example of an isomorphism is uploading energy, generated by a household, to a public energy network.

- Discover isomorphic trans-sector examples
- Learn to transfer these isomorphisms horizontally to other sectors
- Clarify if we can benefit from this mechanism of transfer (e.g. knowledge, insight, functions, experience)

Thirdly, a network analysis completes the project:

- Systematic study on the effects of transferring isomorphisms
- Analysis of a Dutch sector network dataset (link weights in euro's)
- Identify innovation hotspots in the sector network as 20 sectors imply more than 1 million trans-sector innovation combinations.
- Setup a database with trans-sector innovation ideas derived from brainstorming, interviews, gaming-sessions and student assignments.

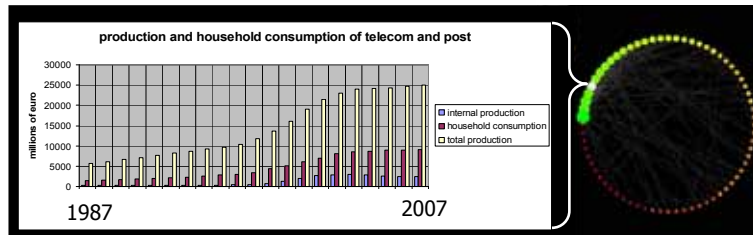
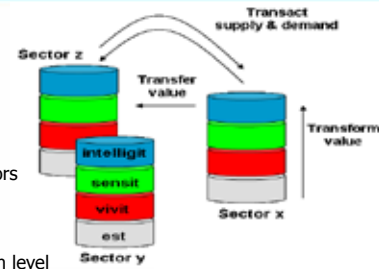
Examples of results

Modeling:

- Telecom sector model from a functional perspective
- Generic layered model applicable to sectors

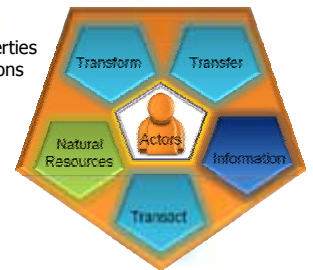
Complex network visualisations:

- Sector network views and graphs
- Plots of financial network flows at division level
- Animation about Smart living & the Dutch sector network



Network functions and properties:

- Overview sector network metrics and properties
- Generic functions and sector specific functions



Possible spin-offs:

- Smart-living service bundle
- Selected trans-sector innovation ideas
- Advice on solving classification difficulties
- Assess current sector classification methodologies and if applicable, provide a new method and classification proposal to Statistics Netherlands (CBS)
- Assessment of network evolution over time (1987-2007)

Organisations related to this research

- Trans-sector Research Academy for complex Networks and Services (TRANS)
- Dutch Research Delta (DRD)
- KPN Royal
- Statistics Netherlands (CBS)
- Toscani creatief

Conclusions sofar

Today, a worldwide accepted sector classification system does not exist. Current sector classification systems demarcate circa 20 sections. Many definitions exist. A sector could be defined as a cluster of homogeneous activities. Activities are closely related to functions. Most functions appear in various sectors. Only a small minority of the examined functions turned out to be sector specific.

At division level, the probability distribution of the financial flows in the Dutch sector network seems to follow a power law with an exponent value around 1,9. What this means is still unknown and needs further study.

Successful innovation is merely a matter of new combinations, mutual trust and multi-actor orchestration. When sectors and its' players evolve to a real network approach, still hidden revenue could reach them all.



Related NAS projects
KPN/TNO/TU Delft: TRANS

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