

**Introduction**

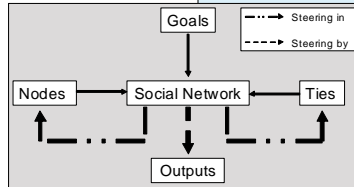
The public administration use of the concept of 'policy networks' differs substantially from the conceptualization of networks in sociology. Networks are in the public administration literature often referred to as a 'new mode of governance', potentially more effective and efficient than hierarchies and markets. Attention is paid to the relations between network characteristics and policy outcomes, but as yet no real policy network theory has resulted from these efforts. Taking the more advanced theory and methodology of social network analysis as a point of departure, this poster introduces a model that is a first step to such a policy network theory.

Starting from the assumption that networks are activated or created within the framework of a certain policy area to contribute to or facilitate the attainment of a specified set of policy goals, the dynamic network model displayed to the right distinguishes between 'steering in networks' and 'steering by networks'. Steering in networks refers to those actions of network actors that attempt to change the composition variables and the relational variables of the social network, i.e. the nodes and the ties. Steering by networks, on the other hand, refers to those actions taken by network actors that attempt to produce an output.

**Pilot Case**

The ex post explanatory value of the network model introduced here is tested by means of a pilot case study of the Dutch Telematics Institute (TI). TI is one of eight Leading Technology Institutes (LTIs); public-private partnerships established by the Dutch Ministry of Economic Affairs as a policy instrument to prioritize specific technology areas. The LTIs were created with three specific policy goals in mind:

1. The LTIs should develop as low-cost, efficient institutes;
2. The LTIs should combine the needs of industry with the knowledge available within the Dutch knowledge infrastructure and result in increased innovation and technology transfer;
3. The LTIs should develop into internationally renowned centers of excellence in their area of expertise.



**Methodology and Data**

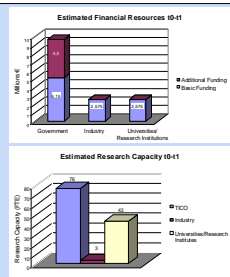
In the pilot case, a positional analysis is performed based on one measured relation, i.e. project involvement. The data used in this pilot study was derived from the annual reports over 2001 (t0) and 2002 (t1), both published by the Telematics Institute (2001; 2002).

**I.A Resource Goals t0-t1**

TI's resource goals for 2002 were rather conservative due to the economic recession.

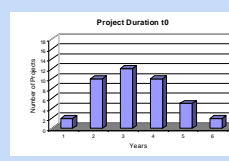
The main goals could be summarized as follows:

- I. Maintain the level of financial contributions from government, industry, and knowledge institutions;
- II. Increase TICO's (TI Central Organization) research capacity with 4,0 FTE;
- III. Maintain the level of 'in-kind' contributions from both industry and knowledge institutions.



**II.A Market Responsiveness Goals t0-t1**

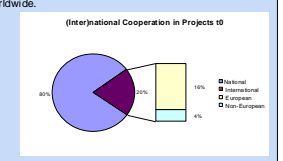
The economic recession hit the information technology and telecom sectors particularly hard and during 2001 TI suffered from its effects. A specific explanation for TI's vulnerability during this period was considered to be found in the Institute's deployment of its resources. Both financial resources and research capacity were to a large extent tied up in long-term research projects. The degrees of flexibility and market responsiveness of the TI-network were lower than considered desirable and therefore viewed as problematic by TI's central management. One of TI's main policy goals for 2002 was therefore geared towards increasing its network's flexibility and market responsiveness in order to be able to respond faster and better to changing economic circumstances.



**III.A Internationalization Goals t0-t1**

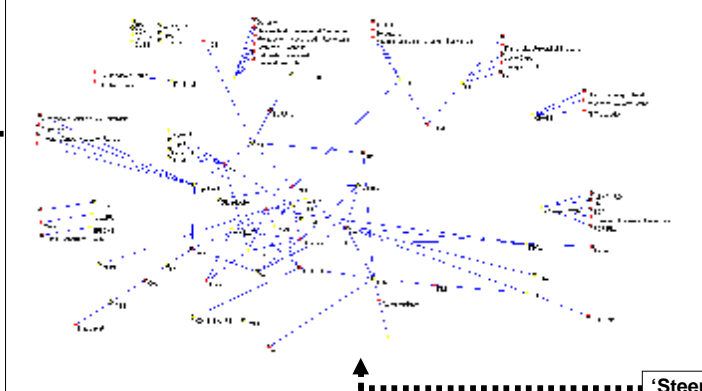
In line with the overarching policy goals formulated by the Dutch Ministry of Economic Affairs, TI wanted to expand its network internationally over the course of 2002. In the previous period of its existence, the TI-network did include some non-Dutch partners, but the Institute had not managed to become a leading Center of Excellence in its area of expertise, either within Europe, or worldwide.

The international cooperation that did manifest within certain research projects consisted only of non-Dutch industry partners. Up to 2002, there was not a single foreign knowledge institution or governmental actor represented in the TI-network.



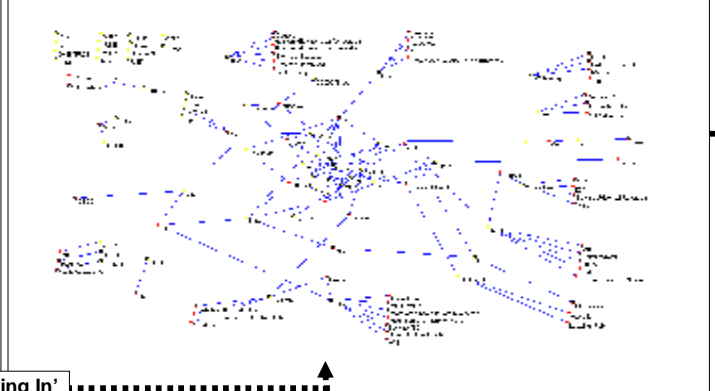
**Network Structure t0 (2-mode)**

● Projects ● Partners

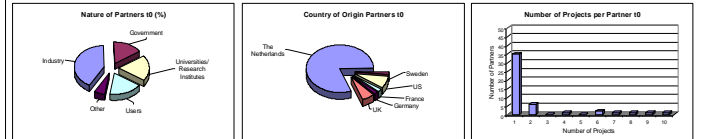


**Network Structure t1 (2-mode)**

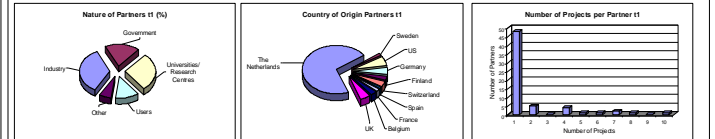
● Projects ● Partners



**Network Characteristics t0**



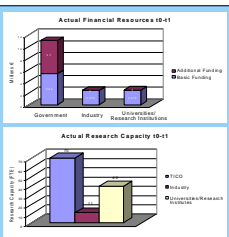
**Network Characteristics t1**



**I.B Resource Outputs t0-t1**

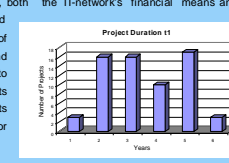
TI largely succeeded in achieving its resource goals:

- I. Government funding (both basic and additional) was above-target;
- II. Industry's in-cash contributions fell below target;
- III. Knowledge institutions in-cash contributions were on-target;
- IV. TICO's research capacity decreased compared to 2001 with 2 FTE;
- V. Industry's in-kind contribution was significantly above target;
- VI. Knowledge Institutions in-kind contribution decreased slightly.



**II.B Market Responsiveness Outputs t0-t1**

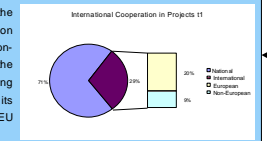
TI was not very successful in increasing its network's flexibility and market responsiveness. While the total amount of resources available was only slightly more than in 2001, both the TI-network's financial means and its research capacity got more tied up in a larger amount of research projects overall, and specifically in more mid- to long-term research projects rather than research projects with a duration of a year or less.



**III.B Internationalization Outputs t0-t1**

TI was relatively successful in expanding its network outside the borders of the Netherlands. Not only did the number of foreign industry partners increase, for the first time also four non-Dutch knowledge institutions participated in research projects of the TI-network.

An additional achievement in the light of the internationalization goal was the integration of non-Dutch governmental actors in the TI-network. TI acquired during 2002 for the first time in its existence funds from the EU framework programmes.



**Conclusions**

Steering in networks was previously defined as those actions taken by network actors that aim to change network structures. In the case of this pilot study, it is therefore necessary to identify those changes in the network's structure that are geared to facilitate the attainment of policy goals. For each of the three policy goals studied, specific actions can be distinguished that could be labeled 'steering in networks', facilitating those actions geared towards producing outputs, i.e. 'steering by networks':

- I. **Resources:**  
For reasons mainly found in the economic situation in the period studied, TI aimed to maintain the levels of both financial contributions and contributions in terms of research capacity from its network partners. Although TI did not manage to keep the individual financial contributions of its partners at the same level as in previous years, the TI-network expanded in terms of its number of partners. The TI-network thus acquired additional partners in order to maintain its total level of financial resources. The changes in network structure in terms of additional partners also affected the attainment of the research capacity goals. The overall in-kind contributions of industry to the TI-network increased to compensate for the decrease in individual partners' financial contributions. An explanation of the significant increase in industry's in-kind contributions is therefore found in both the increase in the contributions of individual industry partners, and the expansion of the TI-network overall.
- II. **Market Responsiveness:**  
Achieving the market responsiveness and flexibility goal required a change in the type of projects that were acquired by the TI-network compared to previous years. The comparison between network structure in t0 and t1, however, points out that this was only to a limited extent the case. Although a minor increase in short term projects is visible, the bulk of the research projects carried out within the TI-network, including those newly acquired, are mid- to long-term projects. For this specific policy goal, the 'steering in' was not sufficient to facilitate the 'steering by'.
- III. **Internationalization:**  
With the aim of strengthening its position as a Center of Excellence outside the borders of the Netherlands, TI attempted, and quite successfully managed, to increase its number of international partners. Part of the additional partners that entered the TI-network were thus specifically targeted for their non-Dutch nationality. These newly acquired partners changed network structures and facilitated at least partially the realization of its overarching internationalization goal, i.e. developing into an internationally renowned center of excellence in their field of expertise.

**Steering in Networks and Steering by Networks**

**Discussion**

The pilot case study of the TI-network has pointed out that the distinction made between steering in networks and steering by networks can be used as an approach to at least partially explain network dynamics and changing network boundaries, but can also help explain how network outputs are created. However, the model as presented here is only a tool to explain ex post the processes of steering in and steering by governance networks. In order to develop a network theory, the following steps are considered necessary:

- \*Instead of a positional analysis, the point of departure should be a role analysis, clustering the associations among relations rather than the associations amongst actors;
- \*From the network structure derived after a role analysis and subsequent positional analysis, hypotheses need to be developed on:
  - a. Structural network characteristics and the feasibility of actions aimed at steering in;
  - b. Structural network characteristics and the feasibility of actions aimed at steering by;
  - c. The interactions between steering in and steering by based on two role clusters.

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