Dynamo 2004
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Type:	National foresight exercise	
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Duration:	2003-2004 **Budget:** €250.000 **Time Horizon:** 2010-2015	

Purpose

The Dynamic monitoring project of the Dutch Ministry of Economic Affairs was a pilot project to gain experience with dynamic and monitoring of future development for business inspiration and policy orientation. It was part of a systematic approach to identify and focus strategic research areas for innovation in the Netherlands for the next decade and link it to the programmatic funding of R&D.

Towards Dynamic and Systematic Monitoring of Future Innovation

In the late 1990s, the Dutch Ministry of Economic Affairs launched a broad foresight exercise to identify major research and innovation areas important to the Dutch economy. After the experience of the Technology RADAR and other international foresight programs, the Dutch Ministry of Economic Affairs came to the conclusion that the effects of a large Foresight Program were limited, and much information was already (internationally) available. On the other hand, there was a need to anticipate on future developments, both from an industrial and governmental perspective.

Looking for opportunities

To address this problem, early 2003 the Dynamo approach was developed as part of a foresight process in order to gain a better view of the relevant national and international innovative developments at a mezzo- or thematic-level.

The overall aim of Dynamo was to facilitate economic development by offering concrete information about possible present and future innovations and issues.
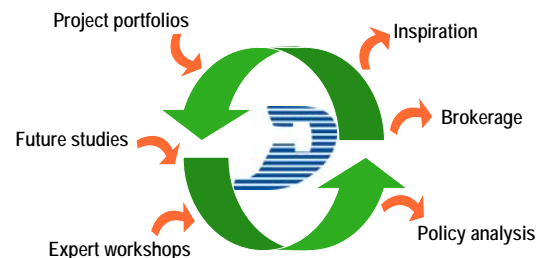
So, Dynamo puts content in the heart of the process. This overall objective is divided into the following objectives:

- To offer information to inspire industrial and research stakeholders into new economic activities.
- To identify and broker possible new areas of co-operation in business and research.
- Offering a platform for dissemination and networking using existing information.
- Feeding the policy process with future oriented knowledge.

Connecting Systematic Monitoring, Inspiration and Policy Development – The Three Stages

The basis of the approach is formed by a continuous gathering of information about important future developments that could be of interest to the Dutch economy. It collects data on the micro level and draws conclusions to the meso level. The information on future developments was gathered by screening future studies and the national research portfolios of SenterNovem, NWO (national funding agencies), and TNO on possible innovations.

The innovations were clustered to innovation themes, on which brokerage meetings were organized. The objectives of these brokerage events were to discuss the value of the themes to the Dutch economy and to initiate networks between research, industry and government.
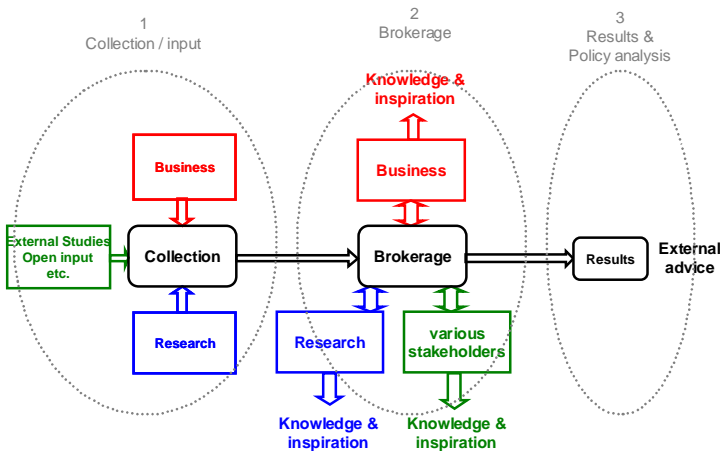
The third stage focused on the policy analysis and policy development. Using an expert panel from industry and research, the findings of the process were analysed and themes prioritized.

A relational database was developed as a central to facilitate systematic gathering of information and enable flexible input and output, and statistical data analysis (The Dynamo expert system).

From 600 innovations to 35 innovation themes

During the exercise, a clustering to themes took place. Dynamo started with 650 innovations, gather from a previous round (200), SenterNovem portfolio (200), NOW portfolio (150), additional foresights (50) and TNO portfolio (50).

All innovations were profiled according to relevant industrial sectors and research areas, using the NACE code and Frascati. This enabled a clustering of related themes, based on similarity index. After a process of computer facilitated clustering and expert panels, 35 main innovation themes were identified.

Overview of identified themes	
Devices for computing and communication	Environmental technologies and management
Coating and other surface technology	Medical drugs and therapies
Enabling technologies for life sciences	Logistics management
Infrastructural works	Chemical conversion technology
Mining of natural resources	Industrial biological technology (white biotech)
Indoor climate systems	Transport safety and efficient automobiles
Materials and construction testing	Sensor technology
Software for computing and communication	Industrial energy systems
Ship building and water transport	Food production technology
Food preservation, quality and safety	Building methods and concepts
Building materials	Industrial safety
Industrial manufacture technology	Agricultural production and management
Public energy systems	Packaging technology
Medical implants and transplantation technologies	Tools and methods for designing products and constructions
Micro- and nanoscale applications	ICT networks and infrastructures
ICT services	Medical diagnostics
Industrial separation technology	Metals and metal products
Plastics and Polymers	

The objective of brokerage and identification of themes were tested during the 'Dynamo Theme Day'. Some 65 participants were present and represented industrial firms, RTOs, government, branch organisations and intermediary organisations. During the day, the Dynamo database was presented and five themes discussed. During the final sessions the added value of the Dynamo database and the underlying process was discussed.

The themes to be discussed were identified by the selection of participants whereby the following five were considered to be of high importance.

- Sensor technologies

- Medical diagnostics
- Enabling technologies for life science
- Transport safety and efficient automobiles
- ICT services

The results of the Dynamo theme day were positive. It showed that new inspiring themes and topics were identified in the collection stage and industry and research appreciated the approach. However, the themes identified for governmental priority were not accepted as priorities for the expert panel due to a low level of stakeholder commitment.

Conclusion: High Industrial and Low Political Usability

Recognized themes and innovations

In some panel sessions, the identified themes proved to be highly relevant, but the added value to more general insight was limited. On the other hand it was not expected that the process would identify totally new themes, because the information source was "existing information".

The approach to create inspiring new demand oriented themes based on the information gathered proved to be a complex process, with fundamental issues (e.g. how to systematically cluster innovations). The inspiring character of the identified theme names was limited and the theme names needed to incorporate the innovative element in the research area.

Also the innovations gathered were mostly 'known'. However, most experts participating in the Dynamo theme day concluded that although most were known, the unknown were of high importance and had high added value.

The identification of innovations looking at the research portfolio of NWO was hard. The researchers found it difficult to translate new scientific insights to possible commercial innovations.

Need for systematic gathering of information

The Dynamo 2004 project showed the need for content oriented information. Although the last decade the shift from forecasting to foresight was made, emphasizing the need for participatory activities, industry, research and government showed a positive attitude for more content oriented projects. But much data is present and just must be systematically collected. The clustering element into innovation themes proved to be of crucial importance.

The shift from research to innovation was another crucial element to make the information more demand oriented (instead of supply). This approach links research and industry.

The government should organize the systematic collection of data. Both industry and research proved to have a need for this type of information, but are unable to develop a systematic approach. An international approach would be welcome.

Industrial and research need for brokerage

Presenting information is not enough. The Dynamo approach included an internet accessible data system, which was considered added value, but the organization of focused workshops on specific innovation themes was highly welcomed. They proved to be inspiring events, but also had to be placed in a more long-term strategy to keep the initiated momentum.

Dynamo added-value to industry

The Dynamo expert system had high added value. The systematic, but dynamic access to the information facilitated different types of users to get new inspiring information for their own perspective.

There was high demand for a brokerage functionality of Dynamo, facilitating creating contacts between possible users of innovation and suppliers. However, this functionality had some fundamental problems in declassifying the information.

The Dynamo interface proved to have an expert character, in stead of a layman character. For broad use of the system, the interface has to be more user-friendly.

Political aspects of identification of policy priorities

The Dynamo 2004 project was a pilot project. The added value to the industry and research was considered high. But from the governmental point of view some fundamental drawbacks were identified. As it showed, the process of selection of governmental priorities is highly political and the objective to identify innovation priorities needs a different process with high stakeholder involvement. The Dynamo expert system can facilitate this process, but will be of limited value.

Spin-off and Follow-up

RADAR 2004

The Dynamo 2004 project initiated a project for the installation branch, initiation new innovations. The approach used had three steps:
- Systematic gathering of future developments
- Identifying important innovation themes
- Selection and making them operational

This project has a high success in initiating innovation in the sector.

New innovation policy process

Within the government, a direct follow up of Dynamo was cancelled. As one of the objectives to identify innovation priorities proved to be a more political process, a systematic system to gather future developments was considered of little added value.

However, the value of Dynamo expert system for stimulating innovation in industrial sectors was considered of value. Therefore, the ministry was supportive to a trajectory to further develop the Dynamo expert system as a network/brokerage system for the industry.

Mid 2005 the ministry will rethink its role in foresight for the Dutch economy. Important aspects are how to collect information, how to cluster information and how to set up focal workshops with initial stakeholders.

Dynamo and TNO

The Dynamo expert system has become a major asset of TNO, now used in over 10 projects. Discussions with several sectoral organizations are initiated to further develop the expert system, as well as the Dynamo approach to stimulate innovation.

Sources and References

The TNO Dynamo website: www.dynamo.nl