### Fact box for the Netherlands Smart Industry policy initiative

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<th><strong>Policy Lever(s)</strong></th>
<th>A triple helix model for agenda setting, building eco-systems and executing supportive smart industry actions</th>
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<td><strong>Funding Model</strong></td>
<td>Combining public funding from state and European regional development budgets with financial and in-kind contributions from industry</td>
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<td><strong>Target audience(s)</strong></td>
<td>Business community in general, specific focus on high-tech industry, chemical, agro-food and logistic sectors</td>
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<td><strong>Impact &amp; Focus Areas</strong></td>
<td>Promotion of a network-centric approach to production, building on intelligent and flexible network approaches</td>
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<td><strong>Key drivers</strong></td>
<td>Encouragement of industry and technology organisations to launch SI and support in implementation of activities</td>
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<td><strong>Key barriers</strong></td>
<td>A lack of existing focus on process innovation, challenges with promoting SI to companies and little available funding</td>
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<td><strong>Implementation strategy</strong></td>
<td>Bottom-up and triple helix approaches for collaboration, agenda setting and implementation</td>
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<td><strong>Results achieved</strong></td>
<td>Setting up 10 fields that will be extended by 14 field labs by end of 2016: each field lab has a turnover between €250.00 to €4 million on a yearly basis</td>
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<td><strong>Budget</strong></td>
<td>Around €25 million for 2014-2017 period complemented by co-financing by industry</td>
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<td><strong>Uniqueness factor</strong></td>
<td>Combining triple helix and bottom-up approaches with an emphasis on network centric production, regions and field labs</td>
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<td><strong>Value-added for policy-makers</strong></td>
<td>Complementing industry policies focusing on top sectors with efforts to set the agenda and induce bottom-up collaboration for industry 4.0 practices</td>
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<td><strong>Expected Impact</strong></td>
<td>Facilitating strategic advantages by building on smart industries and existing Dutch strengths and helping the business community integrate ICT solutions</td>
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*Source: Digital Transformation Monitor*
Smart Industry – an initiative for digitising industries and businesses

The Smart Industry (SI) initiative was launched in November 2014 by the government and industry stakeholders. The objectives are to strengthen the Dutch manufacturing industry position and increase industrial productivity. SI is structured around three main action lines that seek to capitalise on existing knowledge, accelerate and introduce ICT in companies and strengthen knowledge, skills and ICT conditions.

These action lines are further covered by 14 specific action points. SI has a basis in the Smart Industry report and Smart Industry action plan from 2014 that defines and outlines action for the initiative. A programme office has been formed to coordinate and implement the initiative. SI has a basis in a complex funding model, that includes funding from the government, European regional funds and private financing and in-kind contributions.

SI has a background in well-built concepts centred on network centric production, developed by expert research and a broad set of stakeholders. SI complements existing Dutch industry policies and offers strengths in agenda-setting and tailored support activities at the regional-level, for example through field labs that take regional specialisation into account.

SI is run on a comparatively low budget and it has limited resources to fit its ambitious aspirations. Interest and in-kind contributions from industry have however helped to mitigate funding and resource challenges.

A three-pillar industrial policy

After years of decline in the manufacturing output, the deterioration has halted in the Dutch manufacturing industry. The Netherlands provide a high level of ICT and network readiness and its companies perform well on productivity and R&D contributions etc.

However, the Dutch manufacturing industry employs approx. 10 % of the Dutch workforce, which is lower than the EU average. A survey by Smart Industry has also outlined that there is a lack of information among entrepreneurs on digital transformation and on its implications on business models. The government has been working on aligning innovation programmes, support activities and financial instruments as well as strengthening the earning capacity in the manufacturing industry and related service sectors.

SI makes up the third pillar; it emphasises agenda-setting, the building up of eco-systems with industry and technology stakeholders and the execution of support activities. SI thus serves as an extension of the Top-sector policy.

The initiative is grounded in the Smart Industry report² and Smart Industry action agenda³ that defines and outlines concepts and actions. SI was launched at the Hannover Messe in April 2014 and the action agenda was adopted by Henk Kamp, the Minister for Economic Affairs, in January 2015.

It is developed by a consortium of stakeholders, including the Ministry of Economic Affairs, TNO, an independent research organisation, FME CWM, an employers' organisation in technology industry, Powered by Dutch Technology, an initiative by FME, Netherlands ICT, a trade association for ICT, the Confederation of Netherlands Industry and Employers and the Dutch Chamber of Commerce.

"Without Smart Industry no additional growth and jobs” – Dutch Team Smart Industry

Policy levers for the Netherlands’ Smart Industry

Source: Digital Transformation Monitor
Objectives to ensure a future industry fit

SI expects to bring strategic advantages through a combination of smart technologies and existing strengths in innovative and creative concept development, product-service combinations, client-oriented solutions, open communication and integrated collaboration in value chains.

The overall objectives of SI are to catch up with the industry 4.0 frontrunners, to help industry utilise ICT opportunities, to improve industry and manufacturing competitiveness and to promote growth and job creation. This is sought achieved by maximising the use of the most recent information and product technology developments, network centric production and co-creation.

Bottom-up and Triple Helix approaches act as levers for implementation

SI is based on public funding from the government and European regional funds. This is however backed by in-kind and financial contributions from industry. There is an emphasis on deploying digital technology and improving ICT conditions, by taking advantage of existing strengths in the Dutch ICT infrastructure. Although, the emphasis mainly is on technology, SI does not neglect the skills domain.

The importance of skills is recognised by efforts and investments to promote training and education activities in the production field. SI is grounded in Triple Helix and bottom-up approaches, with involvement of industry, universities and research partners and the public sector in agenda setting and in the execution of core activities. The concept of Triple Helix alludes to SI’s focus on collaboration between universities, industry and government.

National and European public funding sources supports SI’s activities

There is a complex funding model behind SI. It includes a mixture of government funding schemes, financing from the European Regional Development Fund and financial and in-kind contributions from stakeholders.

A total of around €25 million has been provided from public sources for a three-year period. This is supported by around €10 million in EU regional funding, which is expected to be increased with another €10 million. In addition, each field lab receives between €1-3 million in public funding, while private funds typically cover 50% of the costs. The private funds rest mainly on in-kind contributions; the cash contributions are limited. Each field lab turnover is annually around €250,000 to €4 million.

SI is backed by financial and in-kind contributions from stakeholders

SI is backed by strong interest from industry and technology stakeholders that have made financial and in-kind contributions available for the initiative’s activities. In terms of research funding, it is typically around 50/50 between public and private funding in the Netherlands. While public financing has been more limited than expected, there has been a strong interest by companies to engage in research projects - some companies have participated in projects without funding.

The leverage ratio within SI activities is not completely clear. While companies do invest significant time, hours and financing in projects, it is challenging to fully calculate the real investments made by companies.

Companies are not required to submit data on how much they spend according to the public funding received. However, on the basis of state aid rulings for TRL 4, the ratio is 50/50 and for TRL 7/8 it is closer to 25/75 resulting in a leverage of around 3.

The ratio should be considered with caution – assuming the amount is higher following investments in both joint projects and later also in the implementation of the solution. The programme office behind SI is funded by participating organisations, which provide personal resources for the office. In total, there is a €100,000 budget to cover the office’s costs.

Three action lines for rolling-out SI

The core activities concentrate on agenda setting, building multi-actor eco-systems and executing support actions and research. SI is organised around three key lines of action, respectively capitalising on existing knowledge, accelerating in field labs and strengthening the foundations.

The first action line concerns the use of existing knowledge and focusses on the gathering and dissemination of knowledge to businesses. This is carried out by providing companies with technological and market understanding, best practices and tools. Specific activities cover presentations, a website, online training modules and business team trainings.

The second action line, acceleration through field labs, is assumingly the most visible part of SI. It seeks to create national and regional ecosystems and interrelated networks of companies and knowledge institutions with a basis in SI principles.
The field labs present practical environments for design, testing, experimentation and deployment of technology solutions. The labs work as operational environments where people can join for discussion, meetings etc. It is basically a location with a programme that is made up of multiple try-out innovation projects and planned training within projects.

The third action line is of a more long-term nature and aims to improve knowledge, skills and ICT conditions. In terms of knowledge, it is focused on strengthening R&D incentives in field labs and to develop a long-term SI research agenda together with top sectors and universities. Human capital conditions are sought upgraded through adapting relevant educational courses and programmes - ranging from primary education to scientific education and dual education - to the needs of SI. It seeks to offer modular educational blocks and to organise courses on sustainable production. ICT conditions are targeted by a vision to develop an increasingly solid and secure ICT infrastructure and by a research programme for the development of software tools that cover chain collaboration, interoperability and standardisation.

**Concepts and focus areas – a network centric approach**

SI is presented as a common and strategic vision for the future Dutch industry. It envisages the use of a network-centric approach to production, building on intelligent and flexible network approaches. In particular, SI builds on three conceptual pillars.

The first pillar concerns high quality and network-centric communication between humans and systems throughout entire value networks. Digitisation of information and communication within production processes and value chains represents the second pillar. The last pillar has a focus on flexible and smart manufacturing technologies that are targeting specific end-user demands.

SI therefore focuses on helping businesses to offer flexibility in production, volume, resource efficiency, costs and adaptability to customer needs as well as to integrate entire value chains in value creation.

**Pressure from industry to develop SI**

Several key drivers support the implementation of SI. There was pressure from companies to follow-up on Germany’s Industrie 4.0 initiative and to set up a framework in this domain, adapted to the needs of Dutch companies. This pressure for developing a smart industry network structure in the Netherlands worked as an enabler for the implementation of SI.

Second, the Netherlands has a strong ICT infrastructure and knowledge position as well as a solid tradition of collaboration in clusters and networks.

Together, this helps SI to support the development of a network-centric approach and a digital transformation of companies. The Dutch “polder model” for consultation and deliberation in decision-making and a strong collaboration base has equally helped SI push forward concepts and collaboration mechanisms.

**Targeting business community at large**

SI aims to reach out to a broad coalition of companies, knowledge institutions and government actors. It aims to foster multi-actor ecosystems among industry, government and science and it addresses the business community in general. Although it covers all sectors, logistics, chemicals, agro-food and high-tech industry are emphasised. SI further draws on expert research to identify key challenges and their impact on industry and society at large.

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**Targeted and/or achieved results for the Netherlands' Smart Industry**

| **Involvement and outreach** | Aims to increase the ratio of companies that are familiar with SI from 14% to 80 % and to increase those actively engaged with SI from 14% to 40%
The aim is to reach out to 5000 companies yearly |
| **Field labs** | A sample of 10 field labs have been set up and another 14 are expected by the end of 2016 |
| **Education** | Around 50 lecturers and 15 schools are teaching on topics related to SI at this stage |

Source: Digital Transformation Monitor
A shared vision and alignment of policy

SI started with a pressure from industry stakeholders to follow-up on Germany’s Industrie 4.0 and to initiate a similar initiative suited to the Dutch business landscape. Prior to SI, policies and supporting activities were fragmented in the SI field and there was a lack of a common understanding.

Efforts have thus been taken to align and complement the different components of the Dutch industrial policy and to develop a shared vision. For this purposes, SI has involved entrepreneurs from the start, in addition to R&D centres and technology providers, with the goal of building a bottom-up approach. Expert research have similarly been used to identify key challenges and their potential impact on industry and society.

The SI report’s recommendations were prepared on the basis of a triple helix approach, gathering input through interviews, surveys, workshops and validation sessions with around 100 stakeholders. On the background of a request for concretising actions by Henk Kamp, Minister for Economic Affair, the SI action plan was developed in broad consultation.

Multi-actor governance for roll-out

The implementation of SI has a starting point in the SI report and action plan. SI’s governance model is covered by the programme office, which is responsible for coordination, sharing of information and dissemination and for implementing the action agenda. In addition, participating organizations are given responsibility for the different activities.

The work on awareness promotion mainly falls under the responsibility of the Chamber of Commerce. The field labs are jointly run by TNO and the Ministry of Economic Affairs. FME is concentrating on skills development and ICT Netherlands and the Ministry of Economic Affairs jointly contribute to ICT activities.

The targeted industries are further supported by regional governmental activities, for example funds and activities to support innovation. Moreover, each of the field-lab teams runs their own regional field lab programme. It should be emphasised that the Dutch regions have positioned and branded themselves into speciality positions. This explains SI’s efforts to spread out and tailor activities and field labs according to the regional context.

Overcoming budget constraints

Dutch innovation policy is more focused on new technology and research rather than on process innovation or the implementation of existing technologies. Dutch industry is thus facing some challenges with a lack of valorisation and in using existing knowledge. While knowledge is significant in many areas, efforts are needed to use it better to develop integrated solutions.

SI further requires a paradigm shift in industry policy, for example by merging production facilities and hardware with software. SI also constitutes a very broad and complex set of practices that may make it hard for target groups to see the full benefits of SI. Another barrier relates to the lack of public funding. The expected public funding allocation was reduced and thus impacted the sustainability foundations behind SI.

Participating stakeholders have however managed to conduct many activities in a short time-frame despite a weakened budget. Lastly, the programme office, which consist of seven people that works part-time, may not offer sufficient capacity to fully address the ambitions of SI. There is an ongoing reflection on how SI’s organisation can be further strengthened.

SWOT Matrix for the Netherlands’ Smart Industry

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<tr>
<th>Strength</th>
<th>Weaknesses</th>
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<tr>
<td>• Involvement and level of support behind regional field labs</td>
<td>• Limited capacity of programme office and a lack of public funding available (funds are expected to increase)</td>
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<td>• Complementarity to linked Dutch industry policies</td>
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<tr>
<th>Opportunities</th>
<th>Threats</th>
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<tr>
<td>• Continued efforts to address fragmentation of policy and activities</td>
<td>• An uneven level of activity among regional field labs</td>
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<tr>
<td>• Collaboration with other EU-countries, e.g. in standardisation</td>
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Source: Digital Transformation Monitor
Achieved results: SI on policy-agenda

SI has been running for around 1.5 years, making it early to fully assess the achieved results. Although the initiative is new and running on limited financing, much has happened in a relatively short timeframe. First, the topic of SI is well integrated on the agenda of policymakers, including within industries, schools, universities and branch organisations.

This represents a key result at this stage. In terms of field labs, there have been more interests and requests than expected. Around 14 of the 24 field labs will be running one or more projects by the end of 2016. 10 of the field labs are in the process of being approved and organised in terms of funding. But all field labs have meetings and discussions ongoing by 2016.

It is estimated that each field lab engages around ten companies, two education institutions and one knowledge institute. Based on the initial work, there seems to be a certain coordination by regions, since each region has a common interest in topics such as 3D printing, IoT, robotics etc. 5

Scalability and transferability

SI stands out, in comparison with similar initiatives, for its bottom-up and triple-helix approaches, including for its emphasis on a network-centric approach, which is closely aligned with Dutch industry strengths in system integration. While field labs are integrated in other national initiatives in the Industry 4.0 field, field labs really make up a core part of SI.

There has been a strong call for field labs, since they help address real and actual problems faced by manufacturing SMEs. There is a potential to scale up domestically on the basis of regional experiences with valorisation of knowledge, for example in the Eindhoven region and ecosystem, which has been successful in building up a large knowledge base.

Lessons learned

The use of a bottom-up and triple-helix-based approach has been the main success factor behind SI during the early stages. Other policy initiatives, like the Top-sector policy applies a top-down approach targeting top sectors. It was felt that there was a need for complementing this with a bottom-up approach in SI. A key lesson learned concerns the lack of funding.

SI runs on a comparably low budget and extra dedicated public funding would give SI a more solid footing. In the Dutch context, the challenge has to some extent been mitigated through voluntary work and in-kind contributions from industry, for example in support of field labs and research projects.

The emphasis on both the regional level and field labs may also offer interesting perspectives. Despite the small size of the country, and the close proximity between companies and field labs, the spread of field labs in different regions underline the emphasis given to facilitate access to knowledge. Lastly, from a policy perspective, SI is really about connecting ICT, research and industrial policy. SI initially prioritised the need for upgrading hardware facilities at the company-level. However, this approach was slowly adapted to a stronger emphasis on software, ICT and digitalisation of economy.

References

3 SI (2014) Action Agenda Smart Industry The Netherlands
5 http://www.smartindustry.nl/site/assets/files/1951/the_dutch_smart_industry_action_program_with_fieldlabs.pdf
About the Digital Transformation Monitor

The Digital Transformation Monitor aims to foster the knowledge base on the state of play and evolution of digital transformation in Europe. The site provides a monitoring mechanism to examine key trends in digital transformation. It offers a unique insight into statistics and initiatives to support digital transformation, as well as reports on key industrial and technological opportunities, challenges and policy initiatives related to digital transformation.


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