

Summary of advisory report number 68

Opening up – Policy for Open Innovation

1 Subject of the advisory report and central questions

This advisory report addresses the trend towards open innovation and the effects it should have on policy. Open innovation is the phenomenon whereby businesses are shifting towards multi-party cooperation in innovation and getting users involved in the development of new products and services. Companies can gain better insight, at an earlier stage, into innovative ideas, knowledge and technologies by opening up to the outside world, than by relying solely on their own sources.

Essentially, the term 'open innovation' means companies innovating in interaction with other parties. This report addresses two central questions:

1. What are the trends in innovation practice in the Dutch business community; is open innovation a growing phenomenon?
2. How should innovation and other policies be adapted in response to the developments in innovation practice?

The report provides a descriptive and analytical answer to the first question and clarifies the concept of open innovation. The answer to the second question is based on an analysis of the most important barriers to open innovation that companies encounter. This report sets out recommendations on the policy issues that ensue from this analysis.

2 Open innovation in the Dutch context: reasons and forms

Open innovation is a term that appeared relatively recently in the management literature which focuses primarily on large American companies. We sought out Dutch examples of open innovation for this report. It turns out that companies here are

constantly engaged in strategic repositioning. In that process they ask themselves questions such as these: How are we going to earn money? What knowledge, competences and components do we need to do that? Should we develop them ourselves or look elsewhere? And, to that end, with whom should we create alliances? The result is that companies are operating increasingly in networks and opening up their innovation processes to input from other parties. In order to better understand why, we will first examine the driving factors for open innovation.

What drives companies to practise open innovation?

The main driving factor is the need for speed in innovation. If companies want to stay competitive globally, they need to innovate faster and more effectively. Moreover, products and service-provision processes are becoming increasingly complex – consider, for example, the interdependency of organisations that provide services via mobile telephones. A related factor is the shift in the market towards an experience economy. The general increase in wealth is producing demanding consumers who want tailored products and services. But it also means that customers are more knowledgeable and engaged – sometimes to such an extent that they join in the innovation process. The dramatic rise of ICT as an enabling technology is making the inter-party cooperation that open innovation relies on possible, certainly now that many technologies are converging (bio, nano and information technology). This creates and offers more opportunities for cross-sector cooperation. And finally, the knowledge landscape outside companies has also undergone major changes, not least due to public policy aimed at facilitating the flow of knowledge. Knowledge institutes occupy a different position, with a strong orientation towards valorisation. And smaller, private, knowledge-intensive parties have begun playing a more prominent role in the knowledge landscape.

Answer: many forms of open innovation

The significance of developments set out above for practical innovation processes in Dutch businesses is that the customer has come to occupy an even stronger central position above companies' own technology or knowledge. Consequently, R&D is more often no longer the starting point for innovation. Furthermore, companies are organising their innovation processes in a more integrated and cyclical fashion, and including feedback moments and decisions regarding the flow of input. In the Netherlands, this has led to a broad spectrum of developments in innovation management. That spectrum can be characterised as open innovation. The binding

element is that companies are no longer innovating alone, but in cooperation with other parties. In day-to-day practice, this takes on different forms:

- Vertical alliances in chains, with suppliers and customers. In many cases, there is a single large, dominant player that defines the network of alliances.
- Horizontal alliances between competitors, primarily in order to set a common standard.
- Horizontal alliances between parties in different sectors, such as Philips and Sara Lee for the Senseo coffee machine.
- Parties sharing resources and facilities, for instance on an open campus.
- Alliances with public knowledge institutes, reflected in the growth of public-private partnerships, e.g. with regard to the food industry.
- Investment in other companies with corporate venture capital, including participation in VC funds and active spin-off and spin-in policy, e.g. at DSM.
- A flourishing trade in patents and licences. Trading in intellectual property, an activity that has taken off in the US, but is also on the rise in Europe and the Netherlands.
- Seeking cooperation with users, by using creative means to identify their wishes and ideas for innovations or taking over their innovations of products and processes.
- Releasing intellectual property rights (patents and licences) to open communities, as IBM did.

Conclusions about the varieties of open innovation

Open innovation is an obvious trend in the Netherlands. It is by no means new, but its importance, intensity and diversity of manifestations are clearly increasing. It is mainly the large multinational companies that are active in this way. Small and medium-sized businesses have been innovating in a more cooperative, open fashion for a longer period of time. They have no other choice, because they have never had the ability to execute full innovation processes alone. Companies frequently undertake more than one of the above-mentioned activities simultaneously; it is not a question of 'either'-or' (either acquire corporate venture capital, or share facilities) but rather a matter of doing both (forming horizontal alliances with other companies and with open communities). This increases the variety and complexity of innovation processes. Open innovation has a definite relationship with all aspects of the innovation process: market introduction, knowledge development, production, prototyping or improving the business model. In each phase of the innovation process, companies make a choice to operate either more or less openly. Open innovation is emphatically more than just

conducting joint research. Therefore, to do justice to open innovation, an overview of the entire innovation process, including interaction with customers, is required.

The word 'open' in open innovation can, in many of its manifestations, be defined as: 'more open than in the past' and with greater involvement of parties from outside the company in question. However, many alliances set their own boundaries and exclusion criteria for parties outside the partnership. These alliances function as closed constellations. This dynamic makes it a crucial issue in which partnerships companies participate. This is because participation in one particular network often means exclusion from another. Competition among network constellations is increasing. Generally speaking, there is no such thing as an entirely open innovation process that is accessible to everyone and freely available. Nevertheless, there are constellations in which 'open' means entirely open or 'accessible to the public'. In these networks parties make their knowledge, inventions and innovations public without attaching exclusive rights to them.

Further analysis and reflection: three forms of open innovation

Looking at the various manifestations of open innovation, two defining dimensions can be identified: (a) the nature and degree of openness to other parties, and (b) the degree of openness of the innovation process itself, in terms of both structure and outcome. Within these two dimensions there is a spectrum of ways in which companies practice open innovation – from markets to commons. The Advisory Council for Science and Technology Policy distinguishes three main styles within this spectrum: purchasing-based innovation, collaborative innovation and open-source innovation.

Purchasing-based innovation

In purchasing-based innovation, companies interact with other parties in the knowledge landscape by purchasing input for the innovation process. Buyers and suppliers of knowledge, intellectual property rights and innovations find each other and create new combinations. This form of open innovation is a kind of cut-and-paste method. In this model, companies wheel and deal with each other, give each other assignments, trade and group licences, invest in spin-offs and other starters, or purchase patents at auction. The principal-agent relationship is key here. The coordination mechanism is the market, with accompanying phenomena such as price-fixing, contracts, negotiations, performance monitoring and court judgments when conflicts arise. Purchasing-based innovation works well when the market for innovation input (knowledge, rights, capital

and inventions) works well. The minimum requirements for that are low transaction costs, market transparency and clear intellectual property rights.

Collaborative innovation

Companies that practise collaborative innovation enter into partnerships – usually long-term – in order to bring about an innovation together. Contributions come from several different parties. The outcome of the process is relatively open; there is a common goal, but it is usually not specified in detail. Sound agreements about mutual expectations and apportioning the input and expected results are crucial in this model. Reciprocity, trust and reputation are also essential mechanisms for building successful alliances. It is of great importance that parties are in a position to enter into alliances; that they are able to find each other, that they are permitted to work together, that they have the right models for cooperation and that they have the right skills and competences. This last requirement includes the capacity to bridge cultural differences or manage interdisciplinary projects.

Open-source innovation

Parties that practise this method of open innovation make their innovations open source, without reservations. This allows others to continue to elaborate on their innovations. They are often individual users, but some companies practise this method, too, for example in rapidly developing sectors. In open-source innovation, many hands make light work and improve the achievements of the entire network. There is usually no money to be made from the innovation itself, but open-source innovation has other rewards: the intrinsic reward of innovating, of making precisely what you need, or the impact on your reputation within the network. Moreover, companies can develop profit-yielding activities using open-source innovations such as support services or they can accelerate their own innovation process. Because parties that practise open-source innovation must be able to innovate in freedom and have good access to each other, they also need access to the Internet.

3 Policy for open innovation

Innovation policy must dovetail with innovation practice. The starting point is that the public authorities cannot usurp companies' roles. Companies must make their own decisions about their innovation strategy and style. It is the government's job to remove

barriers when these appear and to provide incentives for using opportunities. The Advisory Council for Science and Technology Policy is of the opinion that the open innovation trend has produced several reasons for government action. In some cases, the government has already responded to these developments and the Council proposes some adjustments to that response. In other cases, the Council proposes new policy. There are three reasons why government action is legitimate. First, legislation must give innovative companies room to manoeuvre. Second, government action can be desirable when the market fails, e.g. in the case of information deficits or spillovers. Third, the government has a role to play when Dutch companies miss innovation opportunities due to, for example, a competence deficit. The recommendations for policy change fall into the following categories:

- Broadening of innovation policy
- Policy for cooperation and alliance forming
- Policy for intellectual property and competition

Open innovation is a comprehensive, cross-cutting phenomenon that can flourish only within an innovative ecosystem. All the parties involved must be willing to contribute to a positive climate. Nevertheless, this advisory report focuses almost exclusively on the public role in this respect, because it is the Advisory Council's task to advise the Government and Parliament on public policy.

Broadening of innovation policy

Open innovation illustrates more clearly than anything else that the linear model of innovation is out of sync with current innovation practice. Innovation is a cyclical process, with input from an ever-changing array of parties coupled with constant feedback. Innovation does not move in a straight line from fundamental research, through applied research to market research. Instead, the road to innovation meanders, as different types of knowledge from diverse parties are brought together. Innovation is not the exclusive domain of R&D, but arises from cooperation with marketing specialists, users and consumer representatives, competing companies and suppliers. Yet European and Dutch incentive policy for innovation is still based on a linear model. The government should therefore focus fully on an integrated approach to innovation in every detail of its policy implementation.

A more integrated approach is especially needed with respect to end-user input. Customers are an increasingly important source for innovation. Companies need to be able to engage and 'tap' users in creative ways, through innovative market research, by

establishing contacts with user communities or by offering design tools to customers. There are few models for activities like these and most companies lack the skills to make them a success. In addition, users sometimes encounter obstacles when they innovate within open-source communities. For instance, they might be sued by a multinational, despite exercising full open access and operating on a non-profit basis. This is most common in connection with digital products in the creative sector, when users use copyrighted samples and fragments. The government should remove these barriers and even support the development of models for open-source innovation.

The need to broaden innovation policy is particularly pervasive in the field of entrepreneurship, an important element in the innovation ecosystem. While the policy necessary for resolving problems and promoting entrepreneurship has already been developed, independent workers without personnel ('ZZP'ers') still face multiple barriers. This prevents them from making a full contribution to the innovation climate. These obstacles arise mainly in the areas of taxation and social security law. The principle should be that the government gives equal support to employees, self-employed persons and employers in organising their labour.

Recommendation 1: Fully implement an integrated approach to innovation

- Continue urging improvement of the European rules for state support. Ensure that a single broad category for Research, Development & Innovation is recognised for research and innovation projects to receive public-sector support. Interpret the relevant EU rules as widely as possible. Test the boundaries of Dutch innovation incentive policy, and also actively help companies comply with the European rules.
- Start policy experiments in the Netherlands by providing incentives connected with the steps in innovation processes that take place close to the market. Consider, for example, supporting innovation centres, in which all the parties involved in an innovation project can work together in interdisciplinary projects; researchers, developers, designers, ergonomics experts, marketers and end users.
- Provide for an implementation in practice that is appropriate to the integrated approach to innovation. For example, pay close attention to the selection criteria and composition of evaluation committees for programmes and projects.

Recommendation 2: More attention and room for users in innovation policy

- Start policy experiments with the aim of engaging users more frequently and more effectively in corporate innovation processes. Do so within the framework of established innovation policy and allow for implementation at arm's length. The main aim of the experiments is to stimulate knowledge development in order to generate a set of instruments for cooperation between companies and users. Consider, for example, Internet platforms with design software, 'open laboratories', innovation salons or new forms of user and market research.
- Also start policy experiments concerning support for user communities practising open-source innovation. Consider, for example, awarding a prize such as the 'Prijsgeef' (or 'Freely revealing') prize for the most profitable, open-source innovation. Or function as an incubator for open communities, at their request, during their start-up phase. Help them set parameters and formulate project goals and standards, or assist in the development of a first prototype. In this case as well, implementation should be carried out at arm's length.
- Provide for the production and dissemination of knowledge on user innovation and engagement of users in companies' innovation processes. Make the impact of user innovation more visible by including it in the standard statistics.

Recommendation 3: Promote and facilitate entrepreneurship

- Simplify existing rules governing entrepreneurship and reduce the administrative burden for self-employed persons. Make further adjustments to the tax rules to make starting a business attractive. The rules concerning the tax incentives for starting a business should be simple, clear and flexible for companies in the initial phase.
- Test new rules, especially those governing social security, to ensure that they are neutral for self-employed persons and employees. Where the government supports employees in their life-course choices, it should do the same for independent workers without personnel. In order to thoroughly understand the position of self-employed workers, the Advisory Council advocates instituting a temporary (e.g. five years) impact assessment report to chart the effect of socio-economic legislation.

Inter-organisational cooperation and alliance forming

Cooperation is the heart of open innovation. Companies seek out the most suitable partners and develop models for this together. Nevertheless, the government can and

must help facilitate the creation of flourishing networks between companies. In this respect, so-called 'hot spots' should be the core activity of public authorities dealing with innovation policy. Within hot spots, conditions at local, regional, national and cross-border level should be coordinated and tailored to innovation. Sometimes the government needs to help companies, especially small and medium-sized businesses outside hot spots, to cross a threshold – for example, by orchestrating a meeting or, on their request, fostering partnerships.

Companies must be able to enter into alliances with each other and other parties. To do that, they require a number of competences. They need strategic-alliance-forming skills and legal and financial models for cooperation. They also need the capacity to manage the internal organisation such that it is suited to open innovation and to steer employees so that they are able to innovate with other parties. The government can play a role by fostering knowledge development and competences in these areas and by stimulating the propagation of models and best practices.

Recommendation 4: Strengthen the policy on hot spots and support partnership forming

- Invest effort in hot spots – selectively! Local, regional, national and international public authorities should deliver the customisation for which parties express a need. Make sure though these investments are suited to a limited amount of areas, such as the key areas identified by the Dutch 'Innovation Platform'.
- Invest extra effort in facilitating meetings and national and international partnerships – especially for the pioneers in the SME sector. SMEs often suffer from a lack of information that could be reduced by mediation and support. Make agreements in this respect with parties such as SenterNovem, the NFIA/EVD and Syntens.
- Set up a project fund to support proposals put forward by companies to encourage partnership forming in respect of clearly defined challenges. Delegate responsibility for the project fund to SenterNovem.

Recommendation 5: Strengthen knowledge and skills for cooperation

- Assume responsibility for the development and, in particular, the dissemination of knowledge about cooperation and alliance-forming for innovation. Also take responsibility for helping companies acquire the competences required for open innovation:

- Strategic skills; competences in the area of strategic decision-making;
- Strategic alliance-forming skills; the ability to work with external parties successfully, and the elaboration and exchange of models for cooperation;
- Organisational skills; the ability to manage the internal organisation and employees in such a way that they are better able to innovate in networks.
- This knowledge and these skills are needed most in the SME sector. Hold trade associations, Syntens, the new Centre for social innovation, and other parties that have a bridging function towards SMEs responsible for this, and offer them the means to do what needs to be done.

Policy for intellectual property rights and competition

A robust system for intellectual property rights, with a high level of legal certainty and low transaction costs, is crucial to open innovation. A system of this nature would send joint knowledge development and trade in intellectual property soaring. The current practice does not meet this condition, because patents are granted too frequently and are often unclear. This creates uncertainty and generates high costs.

The increasing importance of open-source innovation also requires new thinking about access to knowledge. Several aspects of copyright law are in need of review: digital products, in particular, because companies often seal them. This is coming into conflict with the principle that customers or purchasers are free to do whatever they want to with their product (e.g. sampling), especially if it is meant for non-commercial use. This situation is counterproductive and frustrates user innovation.

By the same token, there is a lack of clarity regarding the application of the Competitive Trading Act in Europe and the Netherlands to conglomerates that practise open innovation, especially when they attempt to set standards or combine intellectual property rights. A fundamental review of the relationship between policy for innovation, competition and intellectual property is therefore required. It is important to map the current uncertainties and think about what problems might arise as parties continue to innovate with each other more and more openly.

Recommendation 6: Improve the quality of patent granting practice

The Dutch government, from its position in the board of the EPO, should continue to urge the European Patent Office (EPO) to evaluate patent applications more stringently. To that end, the internal working method of the EPO should be assessed, paying special

attention to, for example, the resources an examiner is given for a rejection or approval. It should also be determined whether increasing the cost of a rejected patent application would provide an effective disincentive against excessive patent applications.

Recommendation 7: Safeguard access to knowledge for open-source innovation

Within the EU and in the international (OECD, WIPO) context, the Netherlands should keep the discussion alive with regard to access to knowledge for parties practising open-source innovation, such as researchers and users. The Ministry of Justice has a role in this as the body that bears primary responsibility for copyright. The Ministry of Education, Culture and Science also has a part to play in the debate about exemptions for research. The Ministry of Economic Affairs is involved on the basis of its responsibility for innovation policy. A priority is the legislation that restricts access to digital products for innovative users and artists. The starting point is that it should be possible, from a practical perspective, to exercise the right to build on existing works. This places limits on the extent to which digital content in the information and cultural sectors can be 'sealed'. When conflicts arise between open-source communities and companies, it is the government's task to ensure there is a legal 'level playing field'.

Recommendation 8: Clarify the relationship between IP and competition through broad debate

Start a national debate about the relationship between intellectual property rights, competition and innovation with the bodies most closely involved, e.g. the European Commission, the Netherlands Competition Authority (NMa), the European Patent Office and the Dutch Patent Office (Octrooiencentrum Nederland), employers' organisations such as the Confederation of Netherlands Industry and Employers/SME (VNO-NCW/MKB-Nederland) and UNICE, and representatives of knowledge institutes, such as the Association of Universities in the Netherlands (VSNU), the European University Association (EUA) and EARTO. One of the important topics of discussion is the extent to which the development towards more open innovation requires a policy response to uncertainties concerning competition and intellectual property. The Advisory Council considers the hearings that the US Department of Justice and the US Federal Trade Commission held on this subject in 2003 to be a good example in this respect.

The ecosystem requires continuous maintenance

These recommendations do not alter the fact that there are crucial conditions that the government needs to maintain in excellent order: open innovation requires a continual rise in the population's level of education and a solid public knowledge infrastructure with sufficient resources to keep building up the country's 'knowledge stock'. But the Netherlands also needs a superior ICT infrastructure, a high-trust environment in which trust between companies can grow, and a well-functioning capital market. Above all, open innovation needs an open government. It requires all parties to play their role optimally in the innovation ecosystem. In its various capacities – regulator, market manager, purchaser, commissioner and service provider – the government will have to make the most important contribution to that ecosystem, as open innovation becomes more and more pervasive. In a world of open innovation, everyone needs to open up.