Using scenarios in innovation processes

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Abstract: Scenarios and innovation are related to each other through the lead time and uncertainty of innovation processes. By using scenarios, an organisation can prevent investing too much time, money and other resources in ideas for innovations that may not be successful in the future. This paper will specifically report about two cases in which scenarios have been used in innovation processes. It will be described which factors are of importance in the relationship between innovation processes and scenarios.

Keywords: futures research; scenarios; innovation processes.

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1 Introduction

Innovation is by nature focused on the future. Innovation processes take time, sometimes more than innovators (companies) wished for or expected to be. The lead time of innovation processes (the time between the first idea for an innovation and its market introduction) can be so long that during that time many changes in technology, market and/or society can take place. These changes can influence the original idea for the innovation positively and negatively. One way to cope with possible changes that affect the innovation process is by using scenarios to develop a view on the future. By doing this, the innovator can gain information and even knowledge about the future which he can use to adjust the innovation process (if necessary).

However, not much research has been done so far into how the future should be incorporated into innovation processes. Therefore, the research question of this paper is:

How do commercial organisations use scenarios in innovation processes? To answer this research question, two case studies have been carried out.[1] The cases were researched as follows:

The case studies consist of five research elements:

1 *Interviewing*: We interviewed employees of the organisations involved. We asked predominantly open questions to take into account the frame of reference of the interviewees as much as possible. Each interview has been transcribed in full and its main conclusions have been summarised. The conclusions of an interview were checked against other, consecutive interviews. This allowed us to develop the conclusions further and adjust them in the course of the interviews, in a creative process whereby the data (collected in the interviews) are linked to the research question.

2 *Document analysis*: Documents were studied to obtain information about ways companies use futures research in innovation processes, as well as about futures research and innovation processes in general. These documents can be divided into internal (reports and presentations published within organisations) and external literature (all publications about the organisation in journals and other external media).

3 *Participant observation*: By attending and reporting about workshops, additional data were collected about the use of futures research in innovation processes. In this case participating predominantly means attending workshops.

4 *Group discussion*: The conclusions of the case studies were presented to and discussed with the interviewees and a number of other persons. The group discussion helps us to validate the results further.

5 *The case analysis framework*: Data gathered from the cases about the use of futures research and about innovation (processes) were analysed by a case analysis framework to carry out *within case analysis*. The case analysis framework consisted of two elements:

   1 *Analysis of futures research*: To analyse futures research at case level, we looked at the methods, basic elements and process of futures research and we present a list of 'good practices' of methods of futures research with which futures research within the cases can be compared, and provide a general characterisation of futures research within the cases.

   2 *Analysis of innovation*: To analyse the innovation processes within the cases, we used innovation indicators. They provide information about the input, throughput and output of innovation process at the project level and at the organisational level.

2 The link between innovation and future

Many authors have linked innovation to the concept of future and consider the use of futures research in innovation processes very important to the success of an innovation process (e.g. Cooper, 1980; Twiss, 1992a; van Lente, 1993; Floyd, 1997; Tidd et al., 1997; Johannessen et al., 1999). Preez and Pistorius (1999, p.215) state that: "One of the

major challenges in the management of innovation […] becomes one of managing the technological future". The link between scenarios and innovation can be established by (1) the lead time of the innovation process and (2) the uncertainty of the innovation process as further described below:

1 Many innovations take considerable time to develop. During the development time, many changes in, for instance, technology or business can take place. Twiss (1992b, p.258) states: "Nowadays, technical lead times are often so long that a market can be lost before a proper response is made". And: "… during the period the new product is under development market needs may change or they may be satisfied by a competitive product or an innovation based upon a different, and perhaps superior, technological concept" (ibid., p.132).

2 Innovation processes are inherently uncertain and it is very difficult to know how an idea will evolve in the future and which developments it will encounter (Trott, 1998, pp.36–37; Schepers et al., 1999; Freeman and Soete, 2000, p.6; Osawa, 2003, p.343). Twiss (1992b, p.17) states: "For we are now concerned with two dimensions of uncertainty – that of the innovation itself, and of the environment into which it will be launched at some future date". During an innovation process, organisations need to make decisions about how to cope with uncertain developments that (may) influence the innovation, and these decisions may in turn lead to uncertain and unexpected consequences with regard to the innovation.

3 Scenarios

In the scenario method, the idea of predicting the future is abandoned because the future is considered too uncertain. Instead of that, the scenario method aims at *exploring* the future by describing different possible future states. There are many different types of scenario methods and ways to classify them (e.g. van Notten et al., 2003). Table 1 gives the classification by Dammers (2000).

Table 1 Different scenario methods classified by Dammers (2000)

Variable	*Type of scenarios*
Breadth of the scenario topic	Sectoral scenarios vs. multi-sectoral scenarios
Level of aggregation	Micro, intermediate and macro scenarios
Direction of time (from past to future or the other way round)	Projective scenarios vs. prospective scenarios
Amount of exploration	Dominant (i.e. current developments continue in the same direction), limited explorative (i.e. different futures that do not diverge a great deal from the present) and highly explorative (i.e. scenarios that diverge very sharply from the present to investigate the limits of what is possible)
Focus of action	Environmental scenarios (i.e. focus on developments beyond the control of policy-makers) vs. policy scenarios (i.e. focus on alternative ways of executing influence of the environment by carrying out different types of policy)

Alternatively, van der Heijden (1996, p.5) draws a distinction between *internal* and *external* scenarios. *Internal* scenarios are about the future at an individual level where an action is linked to a personal goal: "If I do this then this will happen which will lead to that and so on until I achieve my objective of A". *External* scenarios are mental models of the external world by which ranges of possible future developments are projected. In this paper, we focus on the scenario method that is used to explore various possible futures. This means that a broad view is adopted, whereby not only the different possible futures of the 'scenario issue' are defined, but the various possible social and business environments of the 'scenario issue' as well. This type of scenario method is in line with van der Heijden's *external* scenario method and Dammers' *multi-sectoral*, *meso/macro*, *projective*, *highly explorative* and *environmental* scenarios. Although quantitative information and tools can be used for this type of scenarios, in general they are of a qualitative nature.

4 Case 1: Koninklijke PTT Nederland (KPN) research

Koninklijke PTT Nederland (KPN) Research is the R&D department of KPN, the former Dutch incumbent telecom operator (Post, Telegraph and Telephone (PTT)).

4.1 The 'innovation chain'

The Innovation Chain (IC) is a method that uses scenarios in an innovation process. According to one interviewee who facilitated the IC, the goal of IC is 'to bring customers and experts together to think about innovation'. The IC can be seen as a 'process plan to come from a rough idea to cooperation on a specific topic'. The IC consists of the following five successive steps:

1 *Current situation*: Often the IC starts with a topic or a problem. One interviewee argued that 'if business goes well there would be nothing to innovate'. However, sometimes the IC also looks at how to get more value in the future from existing products, services or telecom infrastructures (such as an intranet). In this first phase of the IC, a tool called 'Business opportunity scan' is sometimes used to signal possible bottlenecks or opportunities. This allows the IC to be more focused from the outset.

2 *Future exploration*: The second step of the IC is exploring the future by using four scenarios and by projecting its main topic onto those scenarios. However, before that the organisation at hand or its customers need to be placed in the scenarios. For instance, if an idea is developed about how a company could use its intranet in the future, it first has to project itself (i.e. the company and its employees) into the four scenarios. It is in particular in this second step that a connection is made between the scenarios and the innovation process.

3 *Future vision*: This step can be seen as a wrap-up of the second step. After exploring the topic with the support of different scenarios, the information is condensed into a single future vision on the topic. Generally speaking, this involves determining which elements of the information belong to which scenario. In other words, it involves identifying what the main topic and the four scenarios have in common. In a

number of cases, this step is simplified by just choosing one scenario and working out that scenario in further detail.

4 *ICT strategy*: The fourth step is to determine a 'road' towards that future. Here, the decision is made which actions need to be taken to realise the future vision.

5 *ICT services*: The future vision and strategy are specified in greater detail by identifying new ICT products and services that allow the IC customers to improve the interaction with their customers.

An important aspect of the IC is that it involves participants from various backgrounds and a high amount of interactivity with the customer is considered important to its success, according to one interviewee.

4.2 Case-conclusions KPN research

4.2.1 The place of the corporate scenarios in the IC

The corporate scenarios are predominantly used in the second step of the IC; the stage in which the future of a certain topic or problem is explored ('future exploration'). The scenarios' main function is to encourage people to think about the future and to come up with new ideas for innovation. The scenarios are not used to assess the value of certain ideas for innovation, although on a few occasions a telecommunication network or (software) platform (such as an intranet or a wireless LAN) was used as the starting point for the session. In those cases the scenarios were used to explore how a product or platform could be used in the future and to identify possible additional services.

However, some interviewees argued that it was not enough merely to think about possible new ideas by using scenarios. They indicated that the scenarios ought to be supplemented by trends that occur in the business sector of the customer involved. This would allow the IC to focus specifically on the problems and practices of its customers, which would extend the use of the outcomes of the IC. A few interviewees argued that paying attention to the customers-specific business context can play an important role in the follow-up stage, that is to say, in the latter steps of the IC (such as ICT strategy and ICT services). Other interviewees pointed out, on the other hand, that this approach may well affect the inspiring character of the scenarios, since trends are much more predictive than scenarios and cannot include the variety of elements that make the scenarios such a valuable tool.

4.2.2 The quality of the IC

Scenario-thinking at KPN research is conducted quite extensively and professionally, and the IC is generally seen in a positive light. Many interviewees involved in the IC, whether as facilitators or customers, are very pleased with the method and its execution during the so-called *Innovation Chain Days*. Generally speaking, the evaluation forms of ICs with different companies were quite positive. Also, KPN account managers consider the IC very valuable, which is proven by the fact that they have put the IC in their product portfolio. They all see it as a tool that adds value to the existing telecom products and services. They all say that the scenarios play an important role in the IC because it enables KPN as well as its customers to think about new ideas for innovation from a market and future perspective.

However, given that scenarios and innovation are two sides of the same coin, this does not automatically mean that the futures researchers and innovators are closely cooperating at KPN Research. The futures researchers were not involved in the trend analysis which was carried out for the innovation *strategy* of KPN Research for 2002. Some interviewees found it odd that a method (i.e. the IC) that is used to advise their customers should not be used for internal purposes.

Different explanations have been offered for not using the IC for the innovation strategy of KPN Research itself. Some interviewees, specifically those responsible for or involved in innovation strategy, said that they knew too little about the IC and that it did not cross their minds when they were carrying out the trend analysis. One interviewee said that that KPN Research has many *experts* on all kinds of subjects, and that being an expert automatically means that you are also able to form an opinion about the future of your own expertise. He said that he did not need the (specific) expertise of the futures researchers for that.

The fact that those responsible for the innovation strategy are not using the expertise of the futures researchers deserves further attention. The futures researchers characterise themselves as *future process experts*, that is, people who are capable of applying methods of futures research. The innovators (or experts) of KPN Research can be regarded as *future content experts*, that is, people who know a lot about (possible) future developments but who are much less familiar with methods of futures research. One interviewee said that he was prepared to conduct an experiment applying the IC to the innovation strategy of KPN Research. Another interviewee said that he regretted not using the expertise of the futures researchers and that next time he would definitely use their expertise because he had encountered some problems during the process of spotting and analysing trends that he found difficult to solve. The expertise of the futures researchers may indeed be of value, since the trend analysis has several shortcomings such as not defining the scope elements of the trend analysis and only looking at trends that were predominantly of a technical nature.

4.2.3 The impact of the IC on innovation

Many interviewees said that the IC has resulted in several *ideas* or *plans* for innovation, but as yet it has not resulted in any specific innovation. They also said that the IC and the scenarios have a positive effect on other current innovation projects in which KPN and its customers participated. An account manager of KPN Corporate Sales for Robeco confirmed this and said that he landed an order from another project because the customer told him that the IC and the scenarios convinced him that KPN was the suitable partner for his company. Knowing this story, an innovator at KPN Research involved with the IC argued that KPN Research (as facilitator and 'owner' of the IC method) should receive a certain percentage of the turnover attributable to that customer. So, although the IC does not result in any specific innovations, it does have a positive influence on some of the innovation projects of KPN and its customers.

5 Case 2: PinkRoccade

PinkRoccade is a Dutch IT company that specialises in IT services and IT infrastructure management. PinkRoccade sells IT services and products, and it insources IT functions of large organisations.

5.1 The foresight project

During the 'dot.com' crisis, in 2000, PinkRoccade went through some rough times. IT no longer was seen as the booming industry it had been and the market changed from a 'seller's market' to a 'buyer's market'. In 2002, PinkRoccade responded by initiating a project called 'foresight', which was intended to make PinkRoccade more future-oriented, and to help employees 'to think outside the box' (or 'lateral thinking', as one interviewee called it). The project received much support from the board of directors of PinkRoccade, and specifically from its CEO. The project's motto was 'foresight, insight, action', to illustrate that its goal was not only to change the way of thinking of employees of PinkRoccade, but also to produce specific business cases.

The corporate scenarios are intended to serve as a general background or as 'business archetypes', as a central person in 'foresight' put it. The corporate scenarios are translated into *business* or *product/market/combination scenarios* that are sometimes worked out more concretely into *industry* scenarios. The distinction between the types of scenarios is also reflected in the differences in time horizon. The time horizon of the (general) corporate scenarios (ten years from now) is different from the one used in the business scenarios. From a business perspective the time horizon of corporate scenarios is fairly broad, making it difficult for users of the scenarios (both in the corporate departments and in the business areas) to narrow down the concerns and challenges of the corporate scenarios to the closer time horizon used by the product and business managers.

The corporate scenarios are business-to-business scenarios. The main focus is on what the business landscapes of the future may look like. The scenarios are not completely in line with the notion that scenarios should be about possible future environments of the organisation. They also focus on new services PinkRoccade could offer in the future and on the organisation of companies and agencies within the scenarios. In other words, the scenarios take themselves into account, which means that there is insufficient emphasis on an outside-in perspective.

5.2 Case-conclusion PinkRoccade

5.2.1 The place of the (scenarios of the) foresight project in the innovation processes of PinkRoccade

The scenarios of the foresight project are mainly used to generate ideas which is in the early phase of an innovation process. Despite the connection with many other management methods, no specific link is made to innovation (process) methods. Some interviewees said that different innovation methods were present (and used) in the different business areas, but that they were not explicitly linked to the scenarios. Also, no specific (or formal) method has been developed to integrate the scenarios and innovation processes. Integration takes place (only) during separate workshops in which the

scenarios are used to generate new ideas for business development (i.e. innovation). However, during the group discussion one participant opposed this view. He argued that the various workshops provide a way to integrate scenarios and innovation. Other participants of the group discussion disagreed, arguing that it still did not constitute a specific method, but merely an agenda for a workshop to think about new ideas for innovation based upon a set of scenarios.

The scenarios have been linked to other management methods but they are not linked to other methods of futures research, apart from an early warning system. A few employees suggested that that may be very helpful for using the scenarios. One interviewee suggested that, since the scenarios aim at the long-term future, it may be useful to use a short-term forecast because of the low level of uncertainty. This would also enhance the possibility that the scenarios are used for business development because it makes them less far-fetched and more urgent. One interviewee said that in a company like PinkRoccade, operating as it does in a very dynamic and competitive industry, scenario-thinking is almost considered 'an abstraction of an abstraction', although 'nothing is as practical as a good theory', he added. By linking the scenarios more to present and concrete issues, employees will find it less difficult to use them. Combining scenarios with a short-term forecast and a roadmap (based upon regular applications of the early warning system) may provide the scenarios with a greater sense of urgency. In addition, other methods of futures research can also bring in more quantitative information and data to narrow the gap between the (corporate) scenarios and the specific business cases.

5.2.2 The quality of foresight

An important motive for the foresight project is to make PinkRoccade more future-oriented and to search for possible new products and services. It is considered important to convince employees that the hay-days of the nineties are over and that the future of the IT market has become much more uncertain and less advantageous than in the former decade. The ongoing shift from a seller's market to a buyer's market is a clear example of this change. However, some interviewees referred to reports produced by market research company Gartner claiming that in 2006 the IT market will grow again and that IT companies have to prepare for when that happens. So, although many considered the future of the IT industry uncertain and as such a suitable subject for scenarios, the idea that better times are ahead serves as an incentive for developing new business cases and other plans.

In addition to making employees more future-oriented, the scenarios are meant to be used for business development as well. This also is very much in line with the wishes (or even demands) of many 'clients' (i.e. users) of the scenarios. These clients are business developers and account managers in the business areas with commercial targets. To realise this goal, additional information is needed to build a business case based on the scenarios. However, this information is often lacking. For instance, there is no information about the size and (possible) growth of the IT market (or parts of it) and that information is definitely necessary for making a business case.

The difference between the two project goals has to do with the different places within PinkRoccade's organisation where the scenarios are used. With regard to 'focus on the future' goal, the focus is much more on the internal organisation of PinkRoccade. With regard to the other goal, there is a much more outward-looking attitude, since the

scenarios are used to propose new business propositions or cases with the aim of expanding current markets or opening up new ones. It can be argued that, as far as the head office is concerned, the internal objective is the primary one, whereas for the business areas the outward-looking goal is considered more relevant. People who work in the business areas are in direct contact with customers, while the head office is further removed.

Although at the level of the business areas there is a desire to make the results of the scenarios as specific as possible and to incorporate market developments in the scenarios, the scenarios are not worked out with customers of PinkRoccade. Some interviewees employed in the business areas said that they felt that, before discussing any future plans with its customers, PinkRoccade first needed to work out what those plans were going to be. In doing so, the company could use the discussions with its customers as a kind of assessment of the scenarios. Involving customers in the scenario process would mean that there would be a greater emphasis on the customer's perspective, and as a result the products and services of PinkRoccade would be described more in terms of how they add value to the business of their customers. The opinion that PinkRoccade should first have its own ideas right and clear is quite in line with the overall 'internal' nature of the foresight project, which became clear when I interviewed internal employees that were exclusively involved in the scenario-building process. On the other hand, in deciding not to involve customers in the generation of business development ideas, the company misses an opportunity to use the experience that it gathered when using 'launching customers' in its business development projects.

A member of the project group said that, with regard to the use of the scenarios, PinkRoccade's decentralised organisation is not always a plus. A decentralised organisation makes the company more unstable, which does not have a positive impact on the follow-up of the scenario project and on the organisational embeddedness of the scenarios. This is especially the case for the management of the event-analysis information that is used to update the scenarios. The information that is needed is often dispersed and it not collected on a systematic basis, because, rather than using a permanent project team, the company has to rely on a number of non-dedicated people at various points in the organisation.

Within PinkRoccade various time horizons are used. For the scenarios a time horizon of ten years has been chosen, for the business scenarios the time horizon is five years and many business plans and business cases use a time horizon of two to three years. The time horizon of specific product development processes at PinkRoccade does not exceed one year. These differences are the result of the fact that the various departments within the company operate in different business situations. A problem is the gap between the time horizon of the corporate scenarios and the dynamics of the business in which PinkRoccade operates. In light of the relatively short time involved in the development of new IT products and services (about two years), one may well wonder whether the time horizon of the corporate scenarios is not too long. A member of the project group said that the corporate scenarios did not really have a fixed time horizon, despite the fact that some interviewees argued otherwise. For him the corporate scenarios are mainly visions of business landscapes at *some* future point. Because the other types of scenarios (business, industry) are more directly linked to business development, the (shorter) time horizon becomes more important. Plans for business development often contain specific sub-plans for the investment in and market implementation of new IT products and services, making it necessary to take a closer look at the time issue. Another problem is

that it becomes more difficult to align the various types of scenarios, since the different time horizons also mean that the scenarios have different levels of detail. A possible solution may be to link the scenarios to methods of futures research, such as roadmapping and back-casting, which are aimed at developments in a less distant future which are also better capable of incorporating quantitative data. Both methods are complementary to the scenario method because they focus on how to reach a certain future (and can therefore be applied to short-term actions and decisions), whereas the scenario method predominantly focuses on establishing which (long-term) futures are possible.

5.2.3 The impact of foresight on innovation

The foresight project has not (yet) resulted in an innovation, although many business cases have been made. As a result of this, the projects face two risks. Firstly, there is a risk that the demand for scenarios may decrease because the IT market is (again) growing, which may be interpreted by employees as a sign that the market is less uncertain. Given the necessary lead time of the use of scenarios for innovation (i.e. building and applying the scenarios), many business cases will not be implemented. The *scenario–business case cycle* will then be cut short and the scenarios will not result in actual innovations. The second risk is formulated by many interviewees who are worried about the follow-up of the scenarios and their use for business development. The interviewees agree that, in order for the foresight project to be successful, it is important that the project not be an on-off exercise. However, they are not in favour of setting up a dedicated department that focuses entirely on scenario-thinking, because that may reduce support for the scenarios at lower organisational levels. Having a separate department involved in scenario development would not have the desired results, because many employees would feel it would smack too much of company policy being forced upon them. "Thou shall is not done at PinkRoccade", as one interviewee formulated it.

Another suggestion was given: to have a person responsible for facilitating, managing, and coordinating scenario-thinking within PinkRoccade. He or she would operate as a spokesperson or an ambassador for the scenarios and as a central figure in the process of building and using of the scenarios. Therefore, social skills and a good knowledge of the internal organisation were mentioned as important characteristics of such a person. We could label this person a 'scenario champion' and he or she would be comparable to the 'product champion', a success-factor for innovation. The product champion is involved in the entire innovation process and as such has an important role in ensuring that an idea for an innovation is fully worked out up to and including its market implementation. The 'scenario champion' should play a role in every phase of the process of building and applying scenarios to innovation processed within PinkRoccade. Having a person in such a role would contribute very much to the use of scenarios in innovation processes at PinkRoccade.

However, having a 'scenario champion' is also risky because if that person would leave the organisation, the whole project may be in jeopardy. In fact, the suggestion was made to a large extent because the current 'scenario champion' was about to leave the company's head office and move to a business area. In other words, it was not so much a cry for a 'scenario champion' as such, but also for a *new* 'scenario-champion'. Also, one interviewee emphasised the need to change the project group in the course of the process of building, applying and maintaining the scenarios. Building scenarios requires a different type of person than maintaining and updating the scenarios. The closer the use

of the scenarios is to the development of new IT services and products (i.e. business development or innovation), the more employees close to the business of PinkRoccade should be involved. This idea is based on the fear that the scenarios would not deliver specific results because the scenario-builders may have a different interest and expertise than the eventual users of the scenarios (i.e. employees within the business areas). One of the tasks of a 'scenario champion' would be to invite the relevant expertise in every phase of the process.

6 Cross-case analysis

Both cases have been cross-analysed to develop overall conclusions. The cross-analysis has been done from the following five perspectives.

Perspective 1: comparison between the scenario methods

The way of building scenarios by KPN Research and PinkRoccade was quite similar, which can partly be explained by the fact that the person who had the main responsibility for the scenarios at PinkRoccade had been part of the scenario project at KPN Research. Both types of scenarios were aimed at societal developments and they can be characterised as *corporate scenarios* that were made more specific to be used by separate business units of the two companies. However, there are also some differences. KPN Research had developed a specific method to combine the scenarios and the innovation process, while PinkRoccade combined the two only in an ad hoc manner (see Perspective 2). KPN Research had interviewed many experts outside the organisation, while PinkRoccade focused on its own experts. KPN Research used the scenarios in the innovation process together with clients, while PinkRoccade did not. Finally, PinkRoccade received support from the board of directors, while KPN Research lacked such support. With regard to innovation, both companies emphasised the importance of combining technological and market-related knowledge. Both companies had a strong technological basis but they were aware of the growing importance of market and societal influences on technological development and innovation. That is also the reason why both companies developed their scenarios from a societal perspective.

Perspective 2: integration of scenarios with innovation

The level of integration of scenarios with innovation can be described as a spectrum ranging from an ad hoc integration, via a so-called *integration method*, to full integration between scenarios and the innovation process:

- *Ad hoc integration*: the scenarios and the innovation process are separate entities that are combined occasionally in an *ad hoc* manner, for instance, in a singular workshop.
- *Integration method*: the integration between scenarios and the innovation process is established by the development of a specific *integration-method* in which the scenarios and the innovation process are integrated or combined.
- *Full integration*: the scenarios and the innovation process are fully merged with each other, i.e. looking to the future equals innovating.

PinkRoccade integrated scenarios and innovation in an ad hoc way, while the *IC* of KPN Research is an example of an integration between scenarios and innovation through a specific method.

Perspective 3: the place of scenarios in the innovation process

In both cases scenarios were used in the earlier phases of the innovation process that in both cases was linear. In these early phases, the first ideas for an innovation were generated and the first specifications of those ideas were made. This means that the main function of scenarios was to inspire innovators to generate new ideas for innovation and not to test the *future-proofness* of existing ideas. Also, the main function in those phases was to create awareness with regard to the importance of innovation and to generate some promising directions for innovation.

Perspective 4: the quality of scenarios

The quality of scenarios is determined mainly by which function it fulfils in the innovation process and the evaluation by its users. If the goal is to enhance the awareness, among clients, of the importance of looking at the future in innovation, one should not be surprised that no actual innovations are developed. To decide about the quality, it is also important that the scenario method is carried out in a transparent way. In both cases, it was quite clear how the input, throughput and output stages of the process of scenarios are linked to each other.

Perspective 5: the impact of scenarios on innovation

The impact of scenarios on innovation depends on what its goal is and on the extent to which people involved accept this goal. Also, the logical link between scenarios and innovation can at the same time have a weakening effect on the impact of scenarios on innovation. That is to say, because of the long lead times of innovation processes (which makes scenarios necessary), few people connect the use of scenarios in the first phases of an innovation process and the actual implementation of a new product or service years later.

The long lead times of innovation processes cause another problem. I assumed that both organisations would look to the future and innovate when business is going well. However, both cases indicate that they find precious little time to engage in scenarios when business is booming, busy as they are satisfying customer demand. When we add to that the fact that both organisations have less resources when business is slow, the conclusion is that there will always be a reason to focus on the problems at hand rather than looking ahead. An explanation between this difference in the macro- and micro-level could be that given the long lead times of innovation processes, the need for innovation and scenarios might be countered because in the meantime the macroeconomic conditions have improved or severe cutbacks in costs have been made. This can result in less need and attention for innovation and scenarios because business is going well again.

7 Conclusions

7.1 Different interactions between scenarios and innovation

The lesson from both cases is that the connection between scenarios and innovation is rather implicit. Although both organisations realise that scenarios are important, they find it difficult to integrate its results into the innovation process. This also means that in both organisations scenarios do not always have a clear and direct influence on the development of innovations. Of course, all this depends on how scenarios and innovation are integrated. Given the differences in the extent to which scenarios and innovation can be integrated, one should not automatically assume that integration provides the best connection between scenarios and innovation. Although at KPN Research scenarios and innovation are closely linked, this link is weaker at PinkRoccade. As a consequence, the use of scenarios in innovation processes is rather diffuse which does not always make it easy to determine its impact on innovation.

7.2 Scenarios as a source of inspiration

In both cases, scenarios are used in the early phase of the innovation process. This means that the purpose of futures research is to inspire innovators to generate new ideas for innovation, which is a common function of futures research, and not to test the 'future-proofness' of existing ideas. Also, in this early phase futures research is intended to create awareness with regard to the need for innovation and to show promising directions.

7.3 Scenarios and the type of innovation

The scenario method can be linked to more radical innovations. This is in line with Pearson's uncertainty map (Trott, 1998), where the fact that 'there is a higher level of uncertainty concerning the outcome of the innovation process and the innovation process itself' means that an innovation is (more) radical. This uncertainty is higher when more new aspects are taken into account in developing the innovation, which also means that futures research should address this multitude of aspects. The cases show that the scenario method is well able to take these aspects into account.

7.4 Scenarios and innovating are human activities

The role of the futures researcher and the innovator are vital. Despite the wide range of methods of futures research and different innovation processes, the futures research and the innovator are of vital importance in applying these methods. Both cases show that, in general, the futures researcher brings in the process skills and the innovator brings in information and knowledge about the issue involved. Usually, the futures researcher is a future *process* expert and the innovator a future *content* expert. Both cases make clear that at present either there is a lack of process skills with sufficient content knowledge, or there are sufficient process skills but a lack of content knowledge. The ideal futures researcher possesses both sets of skills, but this is very rarely the case. The KPN research case shows that a situation in which process and content experts ignore each other is not helpful to integrating futures research and innovation. The PinkRoccade case shows that

attention should be paid to collecting all relevant knowledge of futures research (process and content) within an organisation at a central place to avoid having to rely too heavily on one individual.

7.5 Contribution to the existing body of literature

In Section 1, I stated that few studies focus on the way how futures research is used specifically in innovation processes in commercial organisations. It goes too far to review all literature that address the relationship between futures research and innovation (for an overview see: van der Duin, 2006), but generally, there are three reasons for this consideration:

1 Some studies do not look specifically at the relationship between futures research and innovation, but remain superficial. That is to say, they only describe what the *general* role of futures research in the innovation process is or should be.

2 Although some studies do focus on the innovation process, they focus on *quantitative* rather than qualitative methods of futures research.

3 Some studies do not specifically address methods of futures research but instead use terms like 'vision', which does refer to the future but cannot be considered a specific method of futures research.

So, the added value of this empirical research is that it opens up the 'black box' of the integration between futures research and innovation, both at the level of *methods* of futures research and of innovation *processes*.

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Note

1 The research presented in this paper is part of a broader research into the use of futures research in innovation processes at commercial organisations (see van der Duin, 2006).