



Using scenario planning in regional development context: the challenges and opportunities

Using scenario
planning

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Abstract

Purpose – Planning under conditions of uncertainty is more demanding than doing the same under less uncertain circumstances. Planning which is coupled to high level of uncertainty requires good strategic thinking by the planners. There are a number of methods used for planning under such circumstances. Among these methods is scenario planning. Scenario planning has been used for classical management to help organizations and firms in their decision-making activities. One area where scenario planning has not been used intensively, according to the authors' understanding, is in a regional development context and especially in relation to the innovation aspects and policy issues.

Design/methodology/approach – In this paper, the authors discuss and exemplify the possible utilization of scenario planning to promote innovation in a regional development context. They look at the hidden potential of the method and discuss the challenges of its utilization. To run their analysis, they use a number of cases from the health sector. These cases are unique because they also involved input from a number of actors of the regional innovation system.

Findings – The authors found that scenario planning is a valuable tool to deal with regional development schemes under high level of uncertainty and where diverse actors from the regional innovation system are involved.

Originality/value – The authors argue in this work that scenario planning has the potential to be used, at a more intense scale, in promoting innovation activities in organizations within the context of a regional development drive. Surely, scenario planning need be considered when discussing innovation in relation to introduction of new therapies, new educational schemes, and other regional development initiatives.

Keywords Scenario planning, Regional development, Healthcare sector, Regenerative medicine, Internetization management, The entrepreneurial remedy model, Health care

Paper type Research paper

Introduction

Have good insight into the future rather than using guessing is important if one wants to understand the possible outcomes of ones actions. Guesswork and imagining are two frequently used methods to frame what could be the path forward (Jolly, 1997). However, when dealing with larger changes such as creating new infrastructure, regional development, introducing new medical therapies, and initiating organizational changes or other anticipated radical change, scenario planning is able to help us (Jolly, 1997). This is particularly important as different stakeholders will have a major impact on decision-making processes in relation to such changes. This is especially true when the potential output of the innovation process defines what activities have to



be planned and initiated. For example, planning in the pharmaceutical industry is problematic, especially if a new medical invention is to be commercialized. The more uncertain the outcome of a new invention is, the more resistance there will be to take relevant decisions (Cowlrick *et al.*, 2011). The R&D decision-making processes in the drug industries require changes in the behaviour patterns of the decision makers (Hedner, 2012). Therefore the diffusion of such innovations, most likely, will follow a specific pattern described by Rogers Bell Curve (Rogers, 1962). The uncertainty we face globally results from the interaction of many forces including technological, scientific, cultural, social, political, economic and environmental ones. Substantial resources have been applied and various methods have been developed to facilitate better planning, such as the Delphi method (Kaplan *et al.*, 1950; Blind *et al.*, 2001). However, these methods did not bring noticeable improvement in our insight into the future. A method which deserves closer inspection in planning processes is scenario planning.

Scenario planning is becoming a robust method as it takes out the guesswork element as far as possible, while retaining the ability to consider a variety of plausible eventualities (Kahn and Weiner, 1967). The method considers the different kind of stakeholders in its build-up (Kahn and Weiner, 2000). The term “scenario planning” was first proposed by RAND Corporation (Wack, 1984). Scenario planning is particularly useful when considering the long-term aspects and/or situations in which unexpected changes may disrupt previous trends. In order to achieve that, some universities adopt a tacit “learning by doing” approach to complement the theoretical “learning by reading” approach in relevant academic fields as a bridge between the theory and the practice (Hedner *et al.*, 2010).

The existing literature stressed that the higher level of participation in the decision process required from the involved parties, the more complex, disruptive, and uncertain the issue is under consideration. There is a drive to see regional development through knowledge-based perspective (cf. Etzkowitz, 2004; Etzkowitz and Klofsten, 2005). Because of the higher level of uncertainties in relation to planning at a regional level, one need to realize that implementation of policies aiming at the creation of knowledge-based regional economies is coupled to usage of strategic planning tools such as scenario planning (Etzkowitz and Klofsten, 2005). In scenario planning several and plausible views of what may happen in the future are examined in depth. Pierre Wack, one of the pioneers of this method, described it as a discipline for encouraging creative and entrepreneurial thinking and action in contexts of change, complexity, and uncertainty (Wack, 1984). The scenario planning method requires that there is a thorough fact gathering process similar to a SWOT, SOAR or Delphi process. But in contrast to a SWOT analysis the method considers and weighs the forces and uncertainties that will impact the future. Such reviewing will stimulate novel innovation and business strategies. The anticipated scenarios are based on projections on what could be the outcome. They are only plausible stories (van der Heijden, 1996) which together with an additional step, back casting (Alänge and Lundqvist, 2010), could define the very long impact of change. The agreed story-making would, if it was captured in the right way, improve our understanding of the risks and potential involved, but it also could lead to the acceptance of the necessary changes that have to occur to be able to generate relevant innovations.

The first section of this paper is a general introduction. In the second section we discuss the existing planning methods that involve uncertainty. In the third section we give a general background about the method of scenario planning. In Section 4 we discuss scenario planning utilization in regional development. In Section 5, we look at

the challenges of the utilization of scenario planning in that specific area, i. e. regional development. In the same section, we argue that internetization management is a good management approach to help us to meet such challenges. In Section 6, we discuss the case study methodology. We also discuss the Narrative Textual Case Study (or NTCS) method due to its relevance to this work. In Section 7 we discuss some cases from healthcare sector where scenario planning was used successfully. In Section 8, we draw our conclusion and in the last section we discuss the policy implication of this work.

Planning methods involving uncertainties

Background

Traditional planning methods try to identify the “more likely” future, based on structured knowledge and basic facts. These planning methods do not normally allow for gut feeling, societal perceptions and personal belief although they provide cornerstones to a best guesstimate of future. The underlying assumption is that things will go on in roughly the same way as they did before. But that is not true. There are abundant evidences in our failure to plan for incoming events. Examples of such failure include: the recent financial crisis of 2009/2010, the H1N1, swine flu pandemic and the Eyjafjallajökull eruption in Iceland. There are a number of planning methods used to try to foresee the future. Among these are: predictions, forecasts, and regression analysis. In the following text, we will be discussing these methods.

Predictions

A prediction regards the future at a specified time and look at it with clear assumptions, or in scientific language, conditional probabilistic statements. The not well-informed people or non-scientists would regard these as things that will happen no matter what actions they take to prevent them (Sarewitz *et al.*, 2000). Predictions can be completely misleading. The problem with predictions is that they are generalized and not related to specific person or situation. For example, the survival after a heart infarct is statistically calculated (Smith *et al.*, 2006). However, and regardless of that proven prediction, a specific individual would have a quite a good chance of surviving as related to the existing of such uncertainty. Predictions are based on how things currently are perceived, analysed and the belief on how the situation could impact these predictions. The predictions are therefore model and probability-dependent. They are only valid under the assumption that the model is correct. In conclusion a prediction is the best possible estimate of future conditions under clearly specified assumptions with clearly well-defined drivers.

Forecasts

Forecasts are estimates from a given model. They can be based on the compiled thoughts from one or several individuals. In other terms, if the forecasting is done, the expected results should be realized. For example, in the case of stock markets, the share prizes will be increased as an outcome of a successful forecasting. With forecasting the informed decisions will increase the expected net benefits over a given time, as there is a learning element in them. Theoretically, our forecasts should improve as they are repeated over time.

Regression analysis

Regression analysis is usually based on perceived need in the present and in the future. They rely on performance data, development history, previous knowledge, routines

and reports, models, as well as mathematical and derived available data sets. Regression analysis utilizes the past information to extrapolate into the future. The analysis could be complicated because other analysts will behave differently even when assuming the same analysis, due to different capabilities, internal and external threats and the availability of funding. The process is similar to that in scenario planning and both methods improve their results as more concrete data are obtained. As thus both have a learning component imbedded in them.

Scenario planning

Background

There are a number of different approaches to scenario planning. Most of these are derived from the original work carried out within Royal Dutch/Shell and research undertaken by the RAND Corporation (Wack, 1984). The approaches differ owing to variation in the aim of the planning. All levels are possible, from defining the potentials of a new idea to defining the build-up of an education programme in medicine or a regional development policy (Clark, 2005).

A good understanding of these various approaches requires a good grasping of the economic environment within which organizations of today operate. That is more understandable if one considers the impact of the information and communication technologies (ITCs) on the economic realities and organizations' operations in modern societies. In short, ITCs are creating an economy, which is very dynamic and turbulent through what is known as "e-globalization" (Abouzeedan, 2005; Abouzeedan and Leijon, 2004).

Need for responsiveness

In cases where we do not have concrete data to build one, the methods of predictions, forecasts and regression analysis would not be suitable to use. In such a case, some people may choose not to plan and would feel comfortable with that. However, the risk with such no-planning position is that the decision processes does not move beyond the tangible clear considerations. With situations where the decisions to take care of the problem is of very high-strategic importance and the uncertainty is very high, the no-planning approach can lead to grove results and loss of money and human lives. Weather for example is something you cannot predict, but you might plan for it. Therefore in similar situations, it is better for the management of a firm or organization to adapt, anticipate and act in advance to encounter possible scenarios particularly if there could be large changes anticipated. Such conditions high lighten the ability of the scenario planning to be a tool of strategic decision-making empowerment. In Table I, we outlined the difference between the scenario planning and the other planning methods.

Driving forces

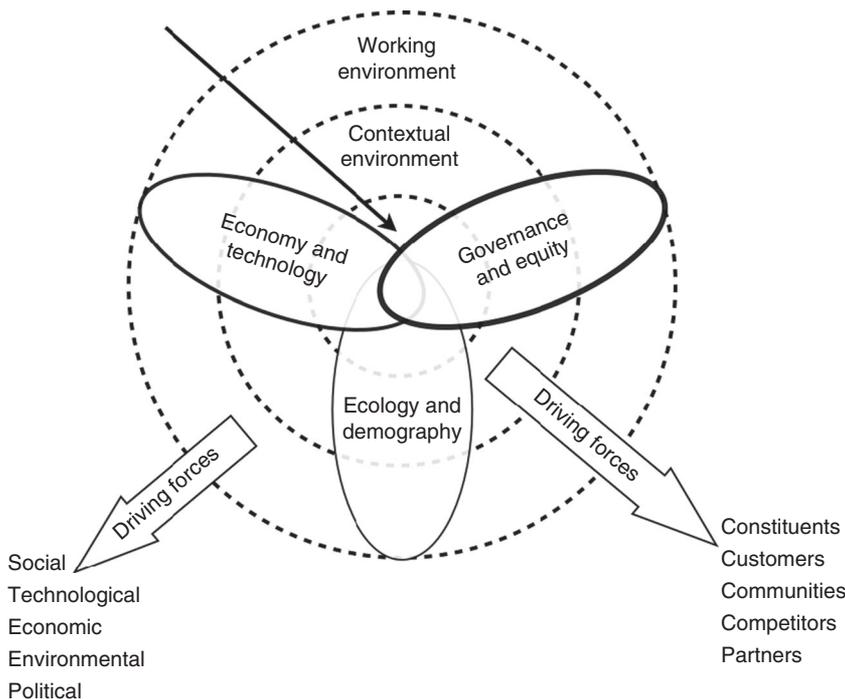
The concept of driving forces is central to scenario planning. It may be discussed from different perspectives (Edgar, 2010). In addition to be linked with uncertainties, a driving force might well be a visible trend. For example the aging of the population of Europe is a significant trend as well as the increased life span in some countries is another clear trend. The birth rate decreases in several European countries which importing the demographic development of the continent, according to OECD reports. These variations in birth rates are uncertain as it is not easily feasible to re-direct them through scenario planning. The changes which produce the exemplified phenomenon

Scenarios	Forecasts	Predictions
Plausible futures Based on uncertainty	Probable futures Based on greater levels of certainty	Based on past performance Based on political pressure/lobbying
Will make different trends visible	Based on different trends but complicated model with increasing number of trends	Based on trends usually one at a time.
Illustrate uncertainty	Hide risks and uncertainties	Well hidden risks and uncertainties
Qualitative or quantitative Used rarely	Quantitative Used daily	Quantitative and pressured Every day
Strong for a medium- to long-term perspective and when there are uncertainties	Strong for a short-term perspective and when there is a low degree of uncertainty	Strong for short-term and where there are strong political pressure (i.e. global warming)

Table I.
Summary of differences between scenarios, forecasts and predictions

Source: Lindgren and Bandhold (2003)

are caused and brought about due to forces impacting our world. Understanding these drives forces is important in building sound scenarios. These can be social, technological, economical, environmental or political. These forces can be initiated by constituents, customers, communities, competitors and partners (see Figure 1).



Sources: Adapted from World Business Council for Sustainable Development, Scarce and Fulton (2004)

Figure 1.
Different factors impacting ones views of the future

In Table II, we present the elements of the definition of the driving forces in scenario planning.

Scenario planning utilization

The potential of the scenario planning method is drawing the attention of major institutions in the world. Scenario planning can be used both by small and large organizations. It can be used both for operational as well as strategy objectives (Boden *et al.*, 2012; Cuhls *et al.*, 2012). Scenario planning was also used in developing of the scenarios for biotechnology in Europe (van Lente *et al.*, 2003). This was a practice in planning in distant mode even though several stakeholders were interviewed on potential scenarios. Out of that effort, four scenarios were developed. These scenarios were described as the rat race, breeding ground Europe, critical balance and exodus. The argued scenarios are interesting innovation policy instruments. The method of scenario planning strengthens the interactions between policy makers, firms and researchers – provided that the conditions are encouraging. One could debate if there have been increasing adoption in the biotech strategy of scenario planning due to this work of the commission. One wonders as to what have happened to academic medicine since the ICRAM proposal? Our experience tells us that in essence there is no change in the drive of utilizing scenario planning in biotechnology sector in Europe. In principle, there is no change in the strategy that stems from the Gothenburg meetings in relation to scenario planning even as these activities are continued.

Obviously, the existence of a good solid baseline case with convincing facts by prominent researchers is not enough to promote move utilization of scenario planning in the biotechnology sector. It is the process where these facts are handled, discussed and agreed upon which seems to be the important step in encouraging people to apply the method. Along with the forces there are stakeholders, in different areas and with different positions. After the first strategy, proposal along with the major trends and uncertainties, of the expected initial scenarios, the internal consistency and plausibility of these scenarios should be assessed (Edgar, 2010). There should be an internal consistency in our planning. If there is no such consistency, then one should put the proposed scenarios aside and create new, plausible scenarios are to be suggested so that there is a wider range of outcomes. There are a few more questions to ask in relation to scenario planning. Among these: are the main future trends all mutually consistent? Can the outcomes postulated for the key uncertainties co-exist? Are the presumed actions of stakeholders compatible with their interests? And do the revised scenarios have been assessed in terms of how the key stakeholders might behave.

Once done, the planer needs to try to reassess if he/she in need do additional research, and need also to re-examine the consistencies of the scenario planning process.

The element	Description
The first	Which factors change radically under paradigm shifts
The second	The forces should cover the social, technological, economic, environmental and political domains
The third	The focal issues (the driving forces) should be used to assess the system
The fourth	The driving forces are the critical uncertainties

Source: Edgar (2010)

Table II.
Elements of the definition
of driving forces in
scenario planning

The investigators will display each of the components of his/her assessment, in an influence diagram. This analysis is used to construct a believable story to describe the scenarios. The Foresight Horizon Scanning Centre of the UK Government Office for Science has performed several cross-departmental scenario works within the UK Government, to consider the impact of the emergence of new economic and political powers on British Society (Rhydderch *et al.*, 2009). The proposals suggested by this group are stated in Appendix 1.

Scenario planning stresses that there are uncertainties that are not controllable by decision makers. The method focuses on plausible (and not necessarily likely) outcomes. This is a different approach from forecasting or predicting, both of which focused on the likelihood occurrence of events. There are a couple of situations, in combination or individually, when using and utilizing scenario planning is desirable. In Table III, we reflected on these situations, we analysed reasons that may legitimized the usage of scenario planning in regional development. These situations have varying level of relevance to regional planning. Most significant are: the dealing with a strategic issue, the need for political decisions among the stakeholders and the uncertain environment.

Uncertainty and strong trends may be demoralizing, confusing and supportive, but it can also inspire us to take further action due to the fact that future is not planned. For disruptive ideas and innovations this is normal. In such context, scenario planning comes relatively easy. The future is being created when the scenario planning is conducted by the activity of different stakeholders. Among the tools that a manager can use for strategic planning, scenario planning stands out the tallest among the crowd. Scenario planning has already been used in number of areas (see Appendix 2). The use of scenario planning will most likely continue to grow. Scenario planning is proven to increase the understanding and managing of uncertain and disruptive innovations. It is challenging, time consuming as there is a stakeholder approach. However, the stakeholders can agree on a process that promotes as it to certain levels of greater insight, innovation and adaptability. The better and improved storytelling will justify a greater acceptance. From an educational perspective scenario planning could be a learning tool and an instrument for shaping and defining strategic thinking. Different scenarios are able, when developed with solid fact base, to help us to grasp the logic of development, and the potential to influence (Searce and Fulton, 2004). But to really develop the scenarios the team of stakeholders can develop a plausible story line, the scenario, that may consider the mistakes seen in other planning and

Situation	Relevance for regional planning
You are dealing with a strategic issue	High
The proposed solution is unclear	Medium
There are several different stakeholders	Medium
There is a need for political decisions among the stakeholders	High
Ethics or belief are involved	Medium
There is no clear solution to the issue (disruptive innovation should be sought)	Medium/high
You are in an uncertain environment	High
The organization(s) are open to change and dialogue	Medium
You have support for a process	Low
You can (believe) attract the necessary resources.	Low

Table III.
Reasons for using
scenario planning
and their relevance to
regional planning

improve decision making the usual sinistram, tunnel vision and overconfidence often seen in a SWOT analysis. Scenario planning can be useful in exploring possible outcomes of disruptive innovations. However, as Lindgren and Bandhold (2003) have pointed out, there are also other reasons for using scenario planning including business/concept development, strategy/organizational development, new thinking/paradigm shift and risk consciousness/need for renewal (Figure 2).

Today, universities are increasingly acting as agents of entrepreneurship and venture creation (Etzkowitz, 2003) through business incubators and regional innovation clusters. University environments enable their students and teachers to create novel ventures, products and services for the market. Although research at universities is important, innovation and entrepreneurship programmes point out the need for venture creation in order to generate novel products and services in new firms and enterprises that ultimately benefit individuals and the society.

Scenario planning utilization in regional development

Background

One area where scenario planning can be used is improving innovation strategies in relation to sustainability (Alänge and Lundqvist, 2010) and in particular in regional development. This is important due to the fact that in promoting innovation and entrepreneurship a number of actors are involved. Understanding the role of each of them is essential in developing sounding regional policies of the economic growth (Abouzeedan, 2008). There are several reports where scenario planning has been used in undertaking policy documents (Bauer, 2010).

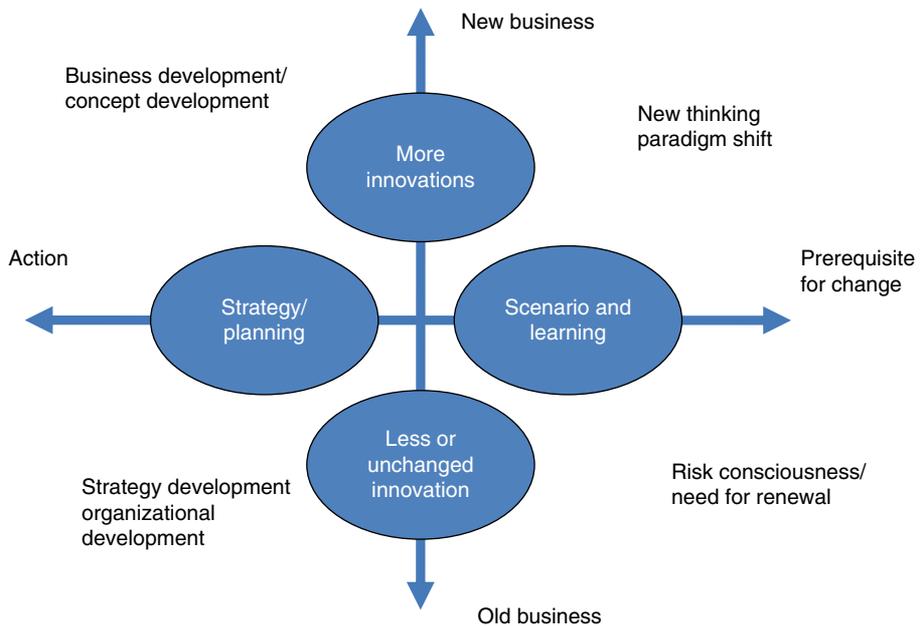


Figure 2.
Scenario planning can be used for many purposes

Source: Adapted from Scarce and Fulton (2004)

Disruptive innovations and regional development

Disruptive innovations are changes that improve a product or service in ways that the market did not expect. For example, the introduction of Losec/Prilosec led to a seismic change in the management of peptic ulcers that traditional models had not predicted. Another example relates to β -blockers, which were contraindicated in patients with heart failure until the findings of a major study by a group in Gothenburg were reported (Hjalmarsson *et al.*, 2000). The investigators achieved significant results using a lower dose than was used prior to the study and in a different kind of formulation. Even the social aspects are impeded in scenario planning in relation to social change Christensen *et al.* (2007) outlined five categories/qualities of disruptive or catalytic social innovators. These represent sound reasons for using scenario planning (see Appendix 3). In Christensen (2006) a discussion about disruptive innovations classified them into three categories: innovations that are financially unattractive to the major stakeholders, innovations that are financially attractive to the major stakeholders, and those innovations are unattainable to the major stakeholders because the technology or capital requirements are simply beyond their reach.

Promoting regional development requires special attention to the role of universities and educational institutions. A good understanding of these possible outcomes of scenario planning needs to be accounted for when planning for a good education of entrepreneurship. Thus, advanced entrepreneurship education today is a vital part of the innovation systems of our two universities in Gothenburg (Chalmers University of Technology and University of Gothenburg). It is continuously developing vastly needed entrepreneurs while also developing new ventures. Our two universities also reside on substantial amount of research in innovation and entrepreneurship (Fredman and Markides, 2009).

To be able to evaluate and develop an idea to a level where one may communicate the future potentials to investors, business colleagues, researchers and society is required that topics like sustainability and the methods for future projections has to be adopted (Alänge and Lundqvist, 2010). However, such research and innovation platforms in selected areas will also depend upon the ability of advanced entrepreneurship education platforms providing both the skills and entrepreneurial drive to develop innovations into economic value (Fredman and Markides, 2009).

The entrepreneurship educational process is our case clearly action based, which requires substantial collaboration, incubation and coordination efforts far beyond what a traditional course leader and course budget can accomplish. Action-based entrepreneurship education that couples students and ideas depends upon a strong integration with the innovation system. Actor like universities, incubators, institutes, industry collaborations, business plan competitions and seed-financiers has to cooperate officially. As a consequence teachers need to be involved in the development of innovation systems at a regional level.

Challenges related to utilization of scenario planning in regional development

The five challenges

One area where scenario planning did not receive a clear attention is in regional development. This is a promising area of application for scenario planning and the potential for which, in our view, have not been appreciated yet. There are a number of challenges that faces the investigator, if he/she wish to apply the method of scenario planning in this particular. These challenges include: understanding the driving forces,

decoding the different roles played by different player, coordinating the effect of the different players, understanding the embedded conflicting between the parties and how they can be solved, and producing policy recommendation base on the scenario planning.

Understanding the driving forces. The driving forces which impact policy decision in regional planning are complex. Understanding these force and decoding them is the first challenge faces the plane. This requires a deep understanding of the social, economic and political conditions prevailing in the region at the time of analysis.

Decoding the different roles played by different player. It is important that the planer understands the different roles played by the different players and what is their motivation. Often different players at the regional playground have, conflicting in sometimes, motives which can be and cooperative in other. The planer ability to see through and understand what motivate the different players is central in successful scenario planning.

Coordinating the effect of the different players. One of the major challenges in scenario planning is how to coordinate the effect of the different players on the outcome scenarios. That is specially difficult, if these roles are conflicting and colliding.

Understanding the embedded conflicting interest between the parties and how they can be solved. Good scenario planning requires that the planers are aware of how conflicting interest of the different parties are taken in consideration. For the planer, imagining and perceiving a clear a clear strategy to handle conflicting interest of the parties is, a must for a successful scenario planning.

Producing policy recommendation base on the scenario planning. The final challenge to scenario planning is to be able to conceive a sound policy recommendation which affect and produce the desire outcome. Actually, that is the ultimate cause why one run scenario planning on the situations of uncertainty.

Internetization management as approach to enhance scenario planning

The ability of the organization to meet the challenges of having a sound scenario planning strategies in very much attached to its management practices. Good scenario planning demands a good insight into the driving forces which affect and direct the way the different scenario are anticipated. Dealing with high level of information demands an approach to management which emphasizes the ability to deal with larger input of data. It necessitates high level of responsiveness and flexibility to act, respond and cope with the dynamics of today's organizational operations.

The traditional paradigms of management such as localized management and networking management cannot deal with high flux of information. They fall short in their ability to response to high level of turbuance and changes in the socio-economic environments of today. One candidate which is able to deal with this problem is the internetization management (Abouzeedan and Busler, 2007). The term "internetisation" or "internetization" first appeared in a paper by Dana and Wright (2002). Abouzeedan and Busler (2007) used the term "internetisation amangement" to argue for a new approach to managing the operations of organizations in the age of e-globalized economy (Abouzeedan, 2005; Abouzeedan and Leijon, 2004).

Optimal scenario planning requires also a clear access to relevant information and input from various actors in the system. As thus the operational and managerial aspects are of central significance to the ability of organizations and firms to conduct a sound scenario planning strategy. Accordingly, the management paradigm and approach utilized by the organization or the firm is to be most coupled to the nature of

the economic environment and realities of today. In this work, we argue that one management paradigm candidate which can deliver an optimal utilization of scenario planning solutions is internetization management (Abouzeedan and Busler, 2007). This paradigm emphasized a dynamic and visionary analysis of management practices which is a core element in scenario planning practices.

Case study methodology

Background

Action-based educational methods encompass live cases, hands on and it requires the student to take the driver seat in developing the innovation. In a “traditional case methodology” the outcome is known before hand as they are history cases and their stories are finished at the time of analysis. We make use of such cases as students take the role of the decision maker when they identify the problem they are faced with (Pettersen, 2005). The next practical step, however, is to work on cases that are not ready-made or fixed solutions or even a road map to the solution. A good process and toolbox exists, however. It is three years since we have added a practical idea evaluation to the two-year curriculum. The capability to evaluate and recognize opportunities in new ideas is an essential third part of “prior experience and education” (Barett and Peterson, 2000).

NTCS method

Case methodology in traditional sense use primary sources for the data. When one using more of the secondary sources of information, which are based at internet and other electronic resources in the public domain then one is talking about the NTCS method (Abouzeedan and Leijon, 2007). The NTCS is a very valuable case study method to use when the electronic resources and web site are used for the covering of the needed data (Abouzeedan and Leijon, 2007). The cases is this paper use secondary data to a larger extent so the methodology is closer to NTCS approach.

Cases from health care

Significance of the healthcare to regional development

In March 2010, a European congress in e-health was held in Barcelona, under the Spanish leadership for EU, based on a document agreed on a governmental level within EU already 2009, that emphasized e-health significance for the EU member. Healthcare affects costs everyone and it is considered to be the fifth most important issue for the average EU citizen (Eurobarometer, 2009). Healthcare costs everywhere in the world is a genuine economic concern (Porter and Teisberg, 2006; Christensen *et al.*, 2009) and considerable efforts should be devoted to plausible long-term changes, that could be discussed and analysed. In such analysis different scenarios could be shared between stakeholders, and worked out to introduce sustainable changes. In Sweden the national IT strategy incorporate several uncertainties which are identified. They are clearly valid in a scenario planning if such planning should be held.

Scenario planning is used in healthcare but information seems not to be fully analysed or even cross-fertilized. In a particular study the issues defined by Porter and others, was isolated and the scenario planning was applied to the healthcare industry, claimed to be US largest economic sector (van der Werff, 1998). Naturally there is a lot of planning involved to manage healthcare organizations and to be able to provide a good outcome for patients. Annually, there are several conferences and meetings both

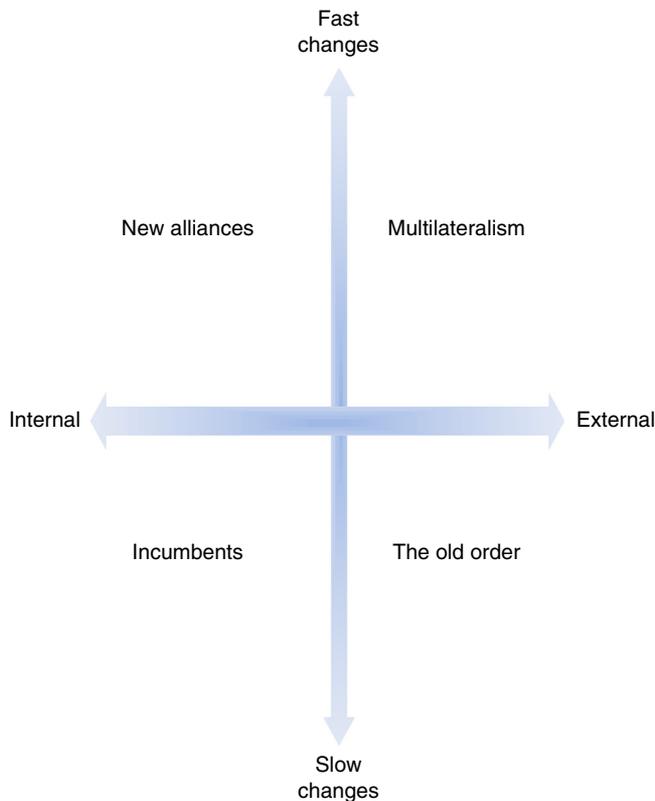
at the national and international level to achieve a better and improved healthcare service. In September 2009 Swedish representatives from academia, healthcare organizations, pharmaceutical companies and politicians were gathered in Gothenburg (Bennett, 2010) to discuss how Swedish health care could be more competitive and improve the commercial potentials for an industrial development. The work was prepared by the Boston Consulting Group with support from a highly respected reference group. The presentation and preparatory information was based on a value-guided health care as a platform for industrial development. Under these conditions the cumulative nine-year projected savings in the medical costs mounted to 58 BSEK while the accumulated cost was estimated at 5 BSEK under this period. These savings amounted to eight times the annual Swedish public and private medical research spends. This is a stunning fact which raised the value of the proposal. In the same meeting the experiences by Michael Porter and Olmsted Teisberg was utilized and partly presented in Porter and Teisberg (2007). The current discussion is about planning and the final outcome will be available in due course as the work proceeds (Bennett, 2010).

Porter and Teisberg (2007) proposed redefining health care by looking carefully at collected documentation and facts. These can serve as a valuable input to the planed scheme. Never before such discussion took place as to how the health care would look like in 20 years ahead. The proposals used both forecasts and the predictions, and emphasized the importance of a high-value healthcare system (Porter and Teisberg, 2007). Importantly it is suggested that the knowledge from other fields which stimulates innovation and spurs value should be called upon (Porter and Teisberg, 2006). A similar approach has been considered where the logic is built on cost analysis and the lack of disruptive innovations (Christensen, 2010). Cost comparisons could be a driver for the development of the health care and would promote the occurrence of innovations (Christensen *et al.*, 2009). Three different action points were considered, technological enabler, business model innovation and value network. Together these proposals could mean a real change in the care of patients, if evaluated and agreed upon in a process. The background justifying the existing situation and the facts are impressive, but the stakeholders' analysis is not visible. Rhydderch *et al.* (2009) discussed some foresight examples (see Figure 3).

The Council of Smaller Enterprises (COSE) organization performed an analysis together with Global business network with the emphasis on small business and the future of US Health Care in 2015. This study resulted in four different scenarios with different outcomes for the system overall, with broad conclusions about marketplace and small business' role (The Council of Smaller Enterprises (COSE), 2007) (see Appendix 4). The recommendation from COSE was that the change needed was the change in the quality of the "Marketplace" and a "Mindset", which is quite similar to the proposals forwarded in the meeting in Gothenburg. However, the difference did lay in the participation in the process, as majority of different stakeholders have taken part in the process. If recommendations stand, the political change occurrence in USA is hard to judge.

Scenario planning in cancer treatment

It is possible to perform scenario planning on potential business cases coming from academic medical research. In this case using students who are enrolled in university innovation and entrepreneurship education programs is at advantage. One group of the GIBBS master program students at University of Gothenburg, Gothenburg,



Source: Rhydderch (2009)

Figure 3.
Foresight examples

Sweden, were asked to do a scenario planning for a new business idea concerning the local administration for the treatment of pre-stage endometrial cancer via hormone therapy. This kind of cancer is a common cancer types in females, with around 1,400 cases in Sweden alone. Current treatment methods are limited to surgery, chemotherapy and radiation treatment, all representing a significant cost to both society and the patient. The cancer is estimated to cost around 200 M SEK for the Swedish society per annum. Thus, an alternative treatment method with little inconvenience to the patient and low cost to society is attractive. In the scenario planning, the analysis of the drivers for the device the students identified five clear trends and four key uncertainties. Out of that they outline four different potential scenarios. The analysis helped the students to see the value of scenario planning in business development strategies. More important it help business develops to see how to tackle the issue of cancer treatment in a specific case.

The case of prosthesis

Every year people need to have parts of their body amputated due to various reasons, such as vascular diseases, natural disasters, wars, etc. For decades, there had been no effective long-term mobility solution for amputees. This part of regenerative medicine has a significant market attraction. About 4.5 million potential candidates worldwide

make up for an estimated market value of \$254 billion USD. So there is a reason for an interest. If prosthesis is to be made to sense, such a solution would provide both customer and societal utility in form of fewer complications, reduced infections, less prosthetic maintenance and a much easier and normal life for the patient. Integrum AB is using a method for attaching prostheses called “direct bone anchorage” which means that the prosthesis can be attached without using a socket, and could the sense be changed, this could alter not only the pattern of movement but also the market acceptance for these kind of prosthesis. In this system the patient preserves all the remaining degrees of freedom that are usually compromised by using a socket. For the patient this means a more stable mechanical coupling. Two groups of students (two groups) were asked to deliver a scenario analysis as part of the feasibility analysis. In this analysis a wide perspective from the development side were identified (see Table IV).

As a combined result the two groups proposed the combination of secured structure (e.g. IP e) and outcome of clinical methodology to be the combined success factors for these innovations. Both structure and process important factors, not surprisingly, are to be considered in this kind of innovation development. The scenario planning could adjust the company strategy to reach a new position. As such scenario planning is a powerful tool to educate students in the entrepreneurship field.

Academic medicine – the ICRAM scenarios

The results of the international campaign to revitalize academic medicine (ICRAM) were published in 2005 in the midst of the summer (Clark, 2005). The academic medicine was defined as the capacity of the healthcare system to think, study, research, evaluate, teach, learn, and improve. Put in other perspective, this is similar to an innovative undertake in health care. The crises for academic medicine was the diagnostic start-point for this campaign, where in medical terms “prognosis and treatment” for academic medicine are less clear. As stressed above the healthcare sector and thereby the academic part is vital. The scenarios presented by Clark (2005) are summarized in Table V.

Table IV.
Major trends and uncertainties in relation to improved prosthesis

Major trends	Major uncertainties
Growth in welfare	Result in clinical trials and clinical practice
Alternative solutions	Superior solutions (by competitors)
Resource availability (> funding)	Regenerative stem cells
Increase patenting	Available patenting
Production capabilities (nano technique)	Changes in social healthcare systems

Table V.
Possible scenarios for the academic medicine

Stakeholder	Perspective
The academic	Where academic medicine flourishes in the private sector
Reformation inc	Where all teach, learn, research and improve
In the public eye	Where the success comes from delighting patients, the public and media
Global academic partnership	Academic medicine for global health equity
Fully engaged	Academic medicine engages energetically with all stakeholders

Source: Clark (2005)

This analysis adds to the perspective that there have to be changes on several levels. One of the proposals is therefore to seek for broader thinking and agreement between different stakeholders, to be able to change and have an impact on innovation process in a national and regional context. New fields of medicine are added and that is why there is a demand for new insights and understanding for the trends and uncertainties involved.

Scenario planning in regenerative medicine

Regenerative medicine is a collective and partially a new science, which seeks to devise new therapies for patients with severe injuries or chronic diseases. In essence, as the principles for physiotherapy, occupational therapy and new treatment forms, cell transplants and tissue engineering have been collectively around for a time now. What is new is having all of these fields under one ceiling with the name of regenerative medicine. Sometimes this regenerative medicine is framed as stem cell transplants. Performing daily exercise has a significant effect on basic blood pressure, blood sugar and brain capacity, without being named regenerative. There are as wide array of major unmet medical needs for to solve using regenerative technologies (Rickne and Sandström, 2009).

These fields believed to be therapies associated with stem cell therapy, and then transferring of cells. If one considers a wider term of, renewal of cells as regenerative, then also activities such as walking, having fun, β -blockers, hormones, growth factors and tissues could be included as they all lead to the renewal of cells or stimulating the function of cells. The area therefore, has a huge potential and extremely important as the world population is becoming older. It will have a significant impact on all areas in medicine and will be of a significant economic importance. Unsolved issues in relation to regenerative medicine includes: how the cost for the development should be shared, how reimbursement should work; how ethics are to be handled. This field in Sweden has been described, from an international perspective, to be in the forefront line of new emerging industries of the life sciences (Rickne and Sandström, 2009). To further investigate these important issues, from a European perspective, ten bio-clusters over Europe have applied and received funding to do research focusing on the European perspectives of the regenerative medicine. The aim is to increase the potentials for research and handling of innovations in the field of the regenerative medicine in Europe (Bauer, 2010). A group of bio-clusters (Bauer, 2010) in Europe agreed earlier in 2010 to apply for a project in the FP7-regions application (Region of Knowledge) in an effort to increase the linking of research clusters in fields of tissue engineering and regenerative medicine (TERM) (Bauer, 2010).

The development of the research and development in advanced therapies and tissue engineering will be a great potential for European economic development. However, Europe needs to improve its research capacity, change the education in the field, accelerate technology and transfer all along this value chain competencies to build the competitiveness. The TERM research in Europe, in relation to USA and Asian efforts, is still fragmented and the resources and knowledge is not shared and there are no models for openness available. Laboratories and companies are still small in an international comparison. That is why the regional support will be needed to attract more investment in research and product development. The expected barriers are scientific, economical, structural, ethical, legal and regulatory ones. They are also slightly different depending on local rules and level of knowledge. Within the consortium a regular SWOT analysis will be performed to gather and agree on the basic knowledge by mapping the actors, the facilities, support measures, the national research priorities

and networks. From the detailed analysis new potential scenarios will be developed to understand the clearly available trends and the uncertainties. The stakeholders, scientist, academics, medical professionals, industry, regional authorities, venture capitalists and legal and regulatory agencies, around Europe, with further meetings construct the story to be presented as the potential strategy for Europe in this field. The work will be finalized and presented 2013 as a part of a policy document.

Conclusions

Planning and economic projecting of the future is becoming a challenging task. Scenario analysis, as we have seen from the given examples, is a strong tool of planning. In regional development the stakeholders (i.e. planners, administrators and policy makers) need to understand possible routes of action related to the development of a region, in a very uncertain environment. Scenario planning is an underused method but it is a powerful tool to use when there is a need to deal with a high uncertainty level in the strategic planning process. Our knowledge and practical experience make us aware that scenario planning can be utilized to further extend our educational experience when dealing with business idea evaluation that. However, introduction of new innovations and other long lasting change. Scenario planning has great practical potential in regional development strategies. In this paper we discussed the embedded potential in using scenario planning in different application areas where high uncertainty is a reality, such as in planning of regional economic growth.

In applying scenario planning in regional development one meets a number of challenges including: understanding the driving forces; decoding the different roles played by different players; coordinating the effect of the different players; understanding the embedded conflicting between the parties and how they can be solved and producing policy recommendation base on the scenario planning. Meeting these challenges requires a new way of thinking in regarding to managing the input into the scenario planning scheme. Planning at high level of uncertainty requires the ability to have a straightforward access to information and the ability to process it quickly and efficiently. Traditional approach to organization's management such as localized management and networking management would not be able to cope with this. This can be granted by applying the internetization management to the organizational and operational aspects of the process. This kind of analysis will make it possible to tackle the challenge of utilizing scenario planning in regional development.

Policy implications

In this paper, we discuss, at the theory level, the utilization of the scenario planning in strategy building in organizations. Scenario planning also provide a practical tool for planners to discuss possible scenarios of the way things proceed in relation to the objectives of their organizations. The tool has potential usages in important areas related to economic and social progress of societies. We hope that this work shall motivate the local policy makers to incorporate scenario planning as a major tool in their strategic planning activities in future. The utilizing of scenario planning in the discussion around healthcare policies can lead to cost savings and elevating the quality of healthcare services in a region. Although this particular paper looked at utilization of scenario planning in regional development schemes, the tool has the potential to be applied in diverse fields.

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Appendix 1

The centre proposals by The Foresight Horizon Scanning Centre, the UK Government Office for Science:

- between 10 and 25 people participate or more depending on the process should participated;
- they should represent a wide range of expertise;
- they should be of different backgrounds with;
- the subject-matter expertise;
- the policy makers and planners that need to use the scenarios generated; and
- operational staff with local, country or regional knowledge has to apply these scenario.

Appendix 2

Examples of areas where scenario planning has already been used:

- spot and utilize disruptive political changes (Eastern Bloc);
- develop service business models (Electrolux, SKF);
- anticipate the 1973 energy crisis (Royal Dutch/Shell);
- identify future needs in biotechnology (WBSCD);
- create new product ideas and new business opportunities (General Electric);
- formulate business proposals for non-profit organizations (Global Business Network);

- develop capabilities and education for the future (PriceWaterhouse Coopers);
- change the focus for product development for a Global Pharmaceutical Company (GSK);
- change the governmental awareness of change (Foresight);
- Nicaragua in 2012 (Foresight); and
- change the medical education (ICRAM)

Appendix 3

Reasons for using scenario planning:

- they create systemic social change through scaling and replication;
- they meet a need that is either over served (because the existing solution is more complex than many people require) or not served at all;
- they offer products and services that are simpler and less costly than existing alternatives and may be perceived as having a lower level of performance, but users consider them to be good enough;
- they generate resources, such as donations, grants, volunteer manpower or intellectual capital, in ways that are initially unattractive to incumbent competitors; and
- they are often ignored, disparaged or even encouraged by existing players for whom the business model is unprofitable or otherwise unattractive and who therefore avoid or retreat from the market segment.

Appendix 4

The four different scenarios are according to COSE analysis:

Where's the traction for a change? The power of inertia is profound, and leads to a continued erosion of benefits and functioning of the system.

Don't just stand there – do something! It is politically irresistible drive that forces the federal government to intervene and guarantee a minimum level of health care for all Americans.

No news [...] good news? Which will leads to proliferation of market-based phenomena (transparency, low-cost innovations, alternative therapies).

New powers, new systems. In a difficult economic environment, individuals, businesses and others find themselves forced to think and act.

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