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Scenario Planning as a Tool to Promote Innovation in Regional Development Context

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Abstract

Scenario planning is a tool that can be used to project and promote innovation activities in organizations. The more disruptive the innovation is, the more beneficial effects can be expected to come out of utilizing a scenario planning process. This planning approach may be considered when discussing innovation in relation to introduction of new therapies, education and other regional development initiatives as well as for most other novel and potentially radical innovations. In this paper, we discuss and exemplify the utilization of scenario planning to promote innovation in a regional development context, which will be linked to innovations as well as the potentials for innovations in the health care area. In this paper we present how we have utilised scenario planning in educational situations to improve strategy for new innovations and what may be done as a preface to introduce major changes in regenerative medicine and thirdly how a new strategy for a new regional strategy for life science industry may be developed.

In contrast to other future planning techniques, scenario planning may provide possibilities for creating various alternative but plausible outcomes (scenarios) of the future and may further provide the possibility to examine them in depth. Scenario planning considers the uncertainties and driving forces that may have an impact on the dynamics of regional development.

In this paper we present how we, in educational situations have utilised scenario planning to improve strategy for new innovations and what may be done as a preface to introduce major changes in regenerative medicine. Thirdly, we discuss the policies and strategies, which are required to promote and enhance the application of the scenario planning technique in initiating and sustaining progress and development in the Nordic region and European perspective.

Keywords:

Scenario planning, innovation, regional development, plausible outcomes

Introduction

It would, without doubt, be helpful to have good insight into the future. Guesswork and Imagining¹ are two frequently used methods to frame what could be the potential way forward. But when dealing with larger changes as new infrastructure, regional development, new therapies, organisational changes or other kind of innovations where different stakeholders will have a major impact on the introduction and decisions for change and scenario planning will be able to consider different stakeholders positions.

The potential outcome and introduction of the innovation will define what activities have to be planned and initiated. The more uncertain the area or the outcome of new innovations is, the more resistance there will be to take decisions, as it involves change in either behaviour patterns. Therefore will the diffusion of such innovations most likely will follow a pattern described by Roger's Bell Curve.² The uncertainty we face globally results from the interaction of many forces: technological, scientific, cultural, social, political, human, economic and environmental. Substantial resources have been applied and various methods have been developed, such as the Delphi method^{3,4}, without noticeable improvement in our insight into the future. But another method deserves closer inspection. In planning processes, which involves different kind of stakeholder to define and participate in the discussion, scenario planning (Royal Dutch/Shell by Kahn and Weiner) is becoming a robust method for taking the guesswork out of the equation as far as possible, while retaining the ability to consider a variety of plausible eventualities.⁵ The term 'scenario planning' was coined somewhat later by the RAND Corporation.⁶ This approach is therefore particularly useful when considering the long term and/or situations in which unexpected changes may disrupt previous trends and where different decision makers, politicians, companies lobby groups etc may part-take in the process. The participation in the process is essential the more complex, disruptive, uncertain and policy affecting the issue is.

There is a drive to see regional development through the lens of knowledge-based approach.⁷ Because of the higher level of uncertainties in relation to planning at a regional level, one need to see to that the phase of implementation in the creation of knowledge-based region⁷ is coupled to usage of strategic planning tools such as scenario planning.

In the process for scenario planning several and plausible views, scenarios, of the future are examined then in depth. Pierre Wack - one of the originators of scenario planning as it is commonly used today- described it as a "discipline for encouraging creative and entrepreneurial thinking and action" "in contexts of change, complexity, and uncertainty".⁶ The 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 it considers and agrees on the forces and uncertainties that will impact the future and will review and stimulate to novel strategies. These scenarios is what could be, they are plausible stories^{8,9} which together with an

additional step, back casting,¹⁰ could define the very long impact of change. The agreed story making will, if captured right improve our understanding, but also acceptance of the necessary changes that have to occur to be able to introduce the innovation or make the change.

The relationship between different factors contributing to the creation of such stories was analysed and described by the *World Business Council for Sustainable Development* (WBCSD), with input from a number of global companies.⁹

Merging the work of WBCSD with that of Global Business Network What if? Report¹¹ lead to the presentation of the relationship of different forces shown in Figure 1.

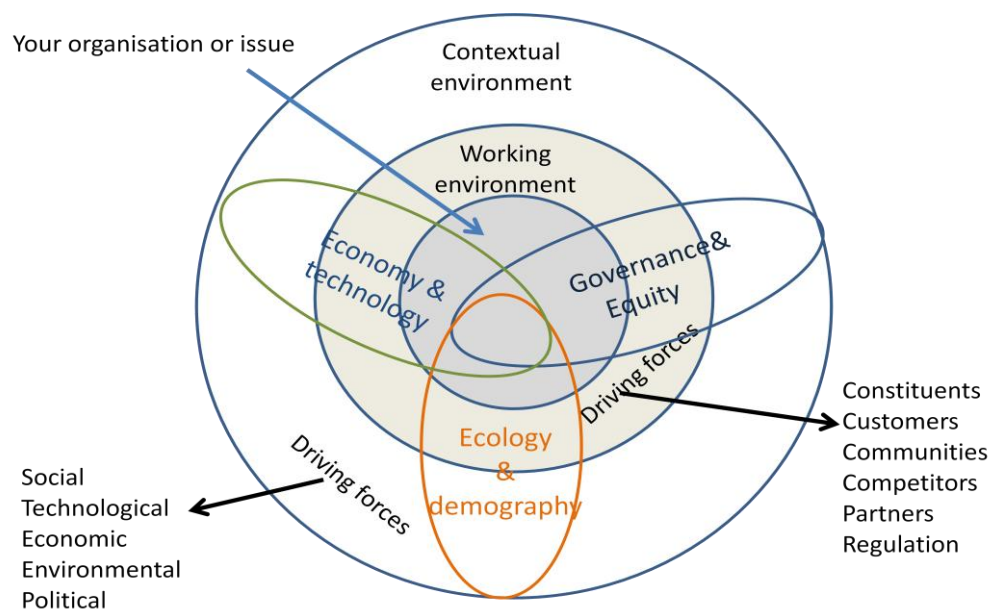


Figure 1. Different factors contribute with different questions and become driving forces to the development of our views of the future. Adapted from World Business Council for Sustainable Development^{9,12} and Global Business Network¹¹

In this paper we present how we, in educational situations have utilised scenario planning to improve strategy for new innovations with a perspective of sustainability¹³ and what may be done as a preface to introduce major changes in regenerative medicine. Thirdly, we discuss the policies and strategies, which are required to promote and enhance the application of the scenario planning technique in initiating and sustaining progress and development in the Nordic region and European perspective.

Planning methods involving uncertainties

Traditional methods tries to identify the ‘more likely’ future, based on structured knowledge, basic facts and do not normally allow for gut feeling and societal perceptions, personal belief although we all know that these provide cornerstones to a best guesstimate of future. The underlying assumptions

are that things will go on in roughly the same way as they did before. But they won't. Just consider the recent financial crisis, the H1N1, swine flu pandemic, and the Eyjafjallajökull eruption.

Predictions

A prediction regards the future at a specified time and look at it with clear assumptions, or in an scientific language conditional probabilistic statements while lay people, the not that well informed or non-scientists regards them as things that will happen no matter what they do.¹⁴¹⁵They might be a bit fatalistic. The outcome of the Copenhagen Summit on Climate change is an example.¹⁶The survival after a heart infarct is statistically, but not individually proven,¹⁷ although you have a quite a good chance of surviving. Predictions are based on how things currently are perceived, analysed and belief on how the situation could impact the predictions. The predictions are therefore model and probability dependent and also assume that the model is correct. In conclusion a prediction is the best possible estimate of future conditions under clearly specified assumptions with clearly defined drivers.

Forecasts

Forecasts are estimates from a given model or based on the compiled thoughts from one or several individuals. Or in other terms if this is done this will (e.g. if this result is realized, the share prizes will increase). With forecasting the informed decisions will increase the expected net benefits over a given time.

Regression analysis

Regression analysis is usually based on perceived need in the present and in the future, performance data, development history, and, bit of knowledge, routine and reports and models, mathematical, derived available data sets. Regression analysis is then used to extrapolate into the future. The analysis could be complicated because others will behave differently even on the same analysis, due to different capabilities, internal and external threats and the availability of funding.

The work process is similar to that in scenario planning and they will both improve the more concrete data made available to feed into the process.

Lack of responsiveness

To do nothing could sometimes be an alternative and another way, but the risk with no planning is that it does not move beyond the tangible considerations. Weather is something you cannot plan but you might plan for the weather, and relate to it. It might therefore in similar scenarios prove better for the management to adapt, anticipate and act in advance, particularly if there could be large changes.

Table 1. Summary of differences between scenarios, forecasts and predictions authors addition and adapted from Lindgren and Bandhold.¹⁸

Scenarios	Forecasts	Predictions
Plausible futures	Probable futures	Based on past performance
Based on uncertainty	Based on greater levels of certainty	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	Quantitative	Quantitative and pressured
Used rarely	Used daily	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)

Driving forces

The concept of driving forces may be compiled from different perspectives.¹⁹

Table 2: The definition of driving forces in Scenario planning.¹⁹

Driving forces	Which factors change radically under paradigm shifts ²⁰	The forces should cover the social, technological, economic, environmental and political domains ²¹	The focal issues (the driving forces) should be used to assess the system. ²²	The driving forces are the critical uncertainties ¹¹
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In addition to be linked with uncertainties, a driving force might well be a visible trend, as example, the graying of Europe is a significant trend, the increase age span in some countries is another. The birth rate decrease in several European countries, according to OECD, is as it varies an uncertainty.

Scenario planning Utilisation

Scenario planning stresses that there are uncertainties that are not controllable by the people making the decisions and focuses on plausible (and not necessarily likely) stories. This is a

different approach from forecasting or predicting, both of which focus on the more likely situation.

Scenario planning is ideal when:

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

Table 3: Reasons for using scenario planning and their relevance to regional planning

Reason	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

Uncertainty and strong trends may be demoralizing, confusing and supportive, but it can also inspire to further action due to that the future is not planned. For disruptive ideas and innovations this is normal, why scenario planning comes relatively easy. The future is being created when the scenario planning is in process by the activity of different stakeholders. Among the tools that a manager can use for strategic planning, scenario planning stands out among the crowd. It has already been used to:

- 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 (Price Waterhouse Coopers).
- Change the focus for product development for a Global Pharmaceutical Company (GSK)
- Change the governmental awareness of change (Foresight)
- Nicaragua in 2012(Foresight)
- Change the medical education (ICRAM)

The use of scenario planning will most likely continue to grow; it's proven to increase the understanding and managing of uncertain and disruptive innovations. It is challenging, time consuming as there is a stakeholder approach, but the stakeholders agree a process that promotes greater insight, innovation and adaptability as it to certain levels. The better and improved storytelling will justify a greater acceptance. From an educational perspective scenario planning could be learning tool and an instrument for shaping and defining strategic thinking. Different scenarios is when developed with solid fact base help us to grasp the logic of development, and the potential to influence¹¹ 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 improve decision-making the usual *sinistram*, tunnel vision and overconfidence often seen in a SWOT analysis.

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.²³ 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.²⁴ 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 individual is important and in relation to social change Christensen and others

²⁵outlined five categories/qualities of disruptive or catalytic social innovators:

- 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
- 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.

In an another publication from Christensen (The ongoing process) the work by Dryer et al was commented on to expand the discussion on disruptive to include innovations to be:

- that are financially unattractive to the major stakeholders
- That are financially attractive to the major stakeholders
- That is unattainable to the major stakeholders because the technology or capital requirements are simply beyond their reach.

With Minute Clinics (www.minuteclinics.com),²⁷ the innovation is provision of low-cost, walk-in clinics in high-traffic areas such as drug stores and shopping malls. They have proved successful and can be considered to be an example of disruptive innovation.

Scenario planning can be useful in exploring possible outcomes of disruptive innovations. However, as Lindgren and Bandhold have pointed out, there are also other reasons for using scenario planning (Figure 2).

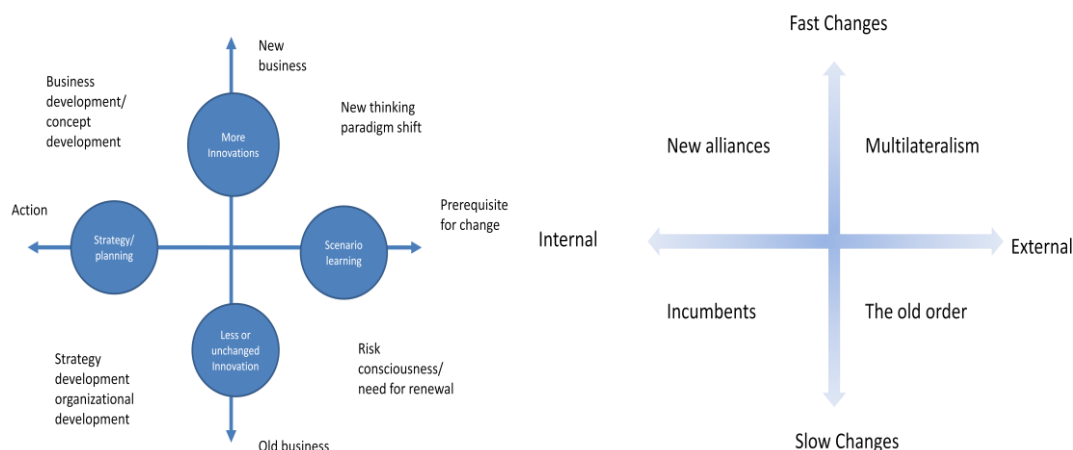


Figure 2. The visuals demonstrating scenario planning can be used for many purposes, and may have different appearances. a) Adopted from Searce D, Fulton K¹¹ and b) Adopted from Foresight examples²⁸

How we used scenario planning in education

Today, universities are increasingly acting as agents of entrepreneurship and venture creation.²⁹ 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 programs 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. 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 theory and practice.³⁰

In Gothenburg we have pioneered advanced action-based entrepreneurship education. In our schools of entrepreneurship, we systematically couple selected entrepreneurial students with high-potential inventions stemming from university research as well as corporate R&D. Beyond the schools of entrepreneurship, the business plan competition for Western Sweden – Venture Cup – shows outstanding participation per capita as compared any other Nordic region. The elective first level course integrated with the competition has approximately 200 students per year from both our universities. The action-based entrepreneurship pedagogy has also been applied to select doctoral courses in different areas such as chemistry, food sciences, molecular biology, etc. Thus, advanced entrepreneurship education today is a vital part of the innovation systems of our two universities in Gothenburg continuously developing vastly needed entrepreneurs while also developing new ventures. Our two universities also reside substantial amount of research in innovation and entrepreneurship related to the four schools of entrepreneurship.³¹

The authors of this report have all since years been involved in handling early innovations and entrepreneurship education in different settings, mostly in Sweden and in Norway, but also in Nicaragua. To be able to evaluate and develop an idea to a level where you may communicate the future potentials to investors, business colleagues, researchers and society is demanding, if you add sustainability as another topic the methods for future looking has to be adopted.¹³ The educational process is in 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 of universities, including incubators, institutes, industry collaborations, business plan competitions and seed-financiers. As a consequence teachers need to be involved in the development of innovation systems and a regional level. Such an involvement is far from the traditional teaching role of many academics. Thus, building action-based entrepreneurship education ultimately requires organizational renewal of parts of the heartland of universities. In many ways this renewal is in accordance with contemporary research and innovation policy favoring dynamic and interdisciplinary research platforms with strong focus on industry collaboration as well as innovation. 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.³¹

Action based means in our education, live cases, hands on, taking the driver seat in developing the innovation. In a ‘traditional case methodology’ the outcome is in all essential part known. We make use of such cases as well, as the students according to the originator of case methodology, Harvard Business School, will take the role of the decision maker when they identifies the problem they are faced with.³² The next practical step however is to work on cases that there is no ready or fix solution or even road to the solution. A good process and toolbox exists however.

Since three years we have added a practical idea evaluation to the two-year curriculum. The capability to evaluate and recognize opportunities new ideas is an essential³³ part of “prior experience and education”. With these findings in mind and based on our own experience we have made the evaluation of at least five ideas and the opposition on three additional ones part of the agenda at the Schools of Entrepreneurship in Gothenburg and the Business Creation and Entrepreneurship program at the University of Tromsø. (TEK 215, MED982, BED002)

The aim of the course is to ensure that students are aware of the critical role that idea evaluations play in the commercialization of technological advances, and are able to carry out idea evaluations and feasibility studies. The tools and constructions presented in the course will be understood in the context of evaluating the commercial potential of an idea, and how it is to be realized as well as its potential in improving sustainable development.

To show the value of scenario planning in different contexts we shall discuss the usage of scenario planning in our entrepreneurial education at CSE (Chalmers School of Entrepreneurship) and GIBBS (Gothenburg International Bioscience Business School). In total we have had more than 20 groups of students developing scenarios as part of their idea evaluation. We have chosen two out of these as examples as they have relevance as ‘medical’ or ‘regenerative’ ideas.

A medical device

One group of our students for the Master program 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 type in females, with around 1400 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 be 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 analysis of the drivers for the device the students identified 5 clear trends and 4 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.

Case Prothesis

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. Could a prosthesis 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 (www.integrum.se) 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.

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 4.

Table 4: 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

As a combined result the two groups proposed the combination of secured structure (IP etc) and outcome of clinical methodology to be the combined success factors for these innovations.

Not surprisingly are both structure and process important factors to consider in this kind of innovation development, and scenario panning could adjust the company strategy to reach a new position .As such scenario planning is a powerful tool to teach students in entrepreneurship field.

Scenario Planning in Health Care , others experience

Naturally there is a lot of planning involved to manage health care organisations and to be able to provide a good outcome for patients. Annually there are several discussions, meetings on national level, and international level to achieve a better and improved health care.

In September 2009 Swedish representatives from academia, health care organisations, pharmaceutical companies and politicians where gathered in Gothenburg ³⁴ to discuss how Swedish health care could be more competitive and improve the commercial potentials for an industrial development. The work was prepared by Boston Consulting Group with support

from a high capability reference group. The presentation and preparatory information was based on a value-guided health care as a platform for industrial development. Under these circumstances the cumulative 9-year savings in medical cost of 58 BSEK while the accumulated cost was estimated a mere investment of 5 BSEK under this period. This corresponds to 8 times the annual Swedish public and private medical research spends. This is a stunning recommendation and value proposal. In the same meeting the knowledge by Porter and Olmsted-Teisberg was utilised and in part presented.³⁵ The discussion is now planning and the final outcome (June 2010) will soon be available as the work is in process.³⁴

In the book³⁶ Redefining health care the carefully collected documentation and facts are gathered to serve as an valuable input to the planning discussion, that never took place in how the health care should look like in ten, twenty years time. It was not the focus, but the input was available. The proposals dealt with the forecasts and the predictions, and the importance of a high-value health care system as stressed. Importantly it is suggested that the knowledge from other fields that competition stimulates innovation and spurs value.³⁵ A similar approach has been considered in a Outside Shot in Business week (March 15th 2010) where the logic is build on cost analysis and the lack of disruptive innovations.³⁷ Cost comparisons could be a driver for the development of the health care and promote the occurrence of innovations.³⁸ Three different action points are considered, technological enabler, business model innovation and value network. Together these proposals could mean a real change in the care of patients, if discussed and agreed in a process. The background exists, the facts are impressive, but the stakeholders are not, visibly, involved.

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 states e-health are of significant importance for the EU-member (e-health).³⁹ Healthcare affects everyone and it is considered to be the fifth most important issue for the average EU citizen.⁴⁰ Health care everywhere in the world seems to have a genuine economical issue^{36, 38, 39} and considerable efforts should be devoted to plausible long term changes, that could be discussed and where different scenarios could be shared between stakeholders, and worked out to introduce sustainable changes. In Sweden, the national IT strategy several uncertainties are identified, clearly valid in a scenario planning if that should be held.

But there are scenario planning in healthcare but information seems not to be analysed or even cross-fertilised. In a study, isolating the issues defined by Porter and others, scenario planning was applied to the health-care industry, claiming to be US largest economic sector. (van der Werff) The study performed in 1998, isolated the same issues the same potential solutions as expressed twelve years later.⁴¹ Is the issues still there due to lack of decisions or lack of involvement by the essential stakeholders, or could the issue be a significant resistant towards innovations?⁴²

The council of smaller enterprises (COSE) organisation performed (when) an analysis together with Global business network with the emphasis of small business and future of US Health Care in 2015. This study resulted in four different scenarios with different outcomes for the system overall, with broad conclusions with a broader marketplace and small business' role in the future.⁴³ The four different scenarios are according to council of smaller enterprises 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*

The recommendation from COSE was that change needed was change in the quality of the “Marketplace” and a “Mindset.”⁴³, which is quite similar to the proposals forwarded in the meeting in Gothenburg. (Above). However the difference is the participation in the process, a majority of different stakeholders have taken part in the process, If the recommendation stand the new US government is hard to judge as of yet (June 2010)

Academic Medicine –the ICRAM scenarios

The results of the international Campaign to revitalise Academic Medicine (ICRAM) was published in 2005 in the midst of the summer.⁴⁴ The academic medicine was defined as the capacity of the healthcare system to *think, study, research, evaluate, teach, learn, and improve*. In an other perspective this is similar to an innovative process, so what do.

The crises for academic medicine was the diagnostic starting point for this campaign, where in medical terms ‘prognosis and treatment for academic medicine are less clear.

The academic medicine status has a significant effect on how health care will be provided paid and utilised in the future. In a new are, see below, the introduction of translational (ref) is even more important. As stressed above (Porter, Christensen, Gothenburg process, COSE) the health care sector and thereby the academic part is vital.

The scenarios presented (Clark) was summarized as:

- The academic inc; where academic medicine flourishes in the private sector
- Reformation; 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.

In summary this analysis adds to the perspective that there have to be changes on several levels. One of the proposals is therefore to seek 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 why there is a demand new insights and making trends and uncertainties work.

The background to new area; 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. The term regenerative medicine have lately been utilized for therapies based on the utilization of stem cells, and the also personalized medicine. But this is not in essence more, as the principles for physiotherapy, occupational therapy, and new treatment forms, advanced therapies and tissue engineering could collectively be named regenerative medicine. However, to perform daily exercise has a significant effect on basic blood pressure, blood sugar, and brain capacity, without being named regenerative, but they still are. However there are as wide array of major unmet medical needs for regenerative technologies ⁴⁵ and usually this is believed to be therapies associated with stem cell therapy, and then transfer of cells. If one considers a wider term of, renewal of cells as regenerative, then also walking, having fun, beta-blockers, hormones, growth factors, tissues could be included as they all renew cells or stimulate the function of cells. The area is therefore huge, potentially wrongly defined, but extremely important for a world population becoming older and will have a significant impact on all areas in medicine and will be a significant importance economically. There unsolved issues in how the cost for the development should be shared, reimbursement should work; ethics are handled as one will affect the perspectives of how long we will live.

The emerging industry in this field in Sweden has been described to from an international perspective to be in the forefront. ⁴⁵ To further understand this from an European perspective In this perspective ten bio-clusters over Europe applied and received funding to research the European perspectives for regenerative medicine to be able to increase the potentials for research and handling of innovations in the field in Europe⁴⁶.

A proposal for a scenario analysis in Regenerative Medicine

A group of bio clusters ⁴⁶ 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)⁴⁶The development of the research and development in advanced therapies and tissue engineering will be a great potential for European economic development, but Europe needs to improve research capacity, change the education in the field, accelerate technology, transfer all along the this value chain to build the competitiveness in relation to US and Asian efforts.

The research in Europe 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, 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, they are also slightly different depending on local rules and 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, legal and regulatory agencies, around Europe will then in meetings construct the story to be presented as the potential strategy for Europe in this field.

The work will be finalised and presented 2013 as a part of a policy document.

Summary discussion and a proposed process for innovations in regional development

There are a number of different approaches to scenario planning; most of them are derived from the original work carried out within Royal Dutch/Shell and research undertaken by the RAND Corporation.⁶ The method and approaches may 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 of an education in medicine (Clark) or a regional policy.⁴⁴

There are several reports where scenario planning that have been used in developing policy documents.⁴⁶ European Commission utilized scenario planning for developing one policy document that became a strategic document⁴⁷ One other example is the development of the scenarios for biotechnology in Europe.⁴⁸ This was planning in distant mode even though several stakeholders were interviewed on potential scenarios that later developed into four scenarios, described as the rat race, Breeding Ground Europe, Critical Balance and Exodus. The authors⁴⁸ states:

- *scenario definition is interesting innovation policy instrument, as it strengthens the interactions between policy makers, firms and researchers – provided the conditions are right.*

One could debate if there been adoption in the biotech strategy due to this proposal. What have happened to academic medicine since the ICRAM proposal? In essence there is no change. In principle they're as of yet no change in strategy that stems from Gothenburg meeting even if there is still an ongoing process.

Obviously a good solid baseline, convincing fact by prominent researchers is not enough. It is the process where these facts are handled and agreed on seems to be the important step. In figure 1 the different forces are described. Along with the forces there are stakeholders, in different areas, different positions.

We have proposed¹⁹ that after the first strategy proposal along with the major trends and uncertainties, the internal consistency and plausibility of the initial scenarios should be assessed. There should be an internal consistency – if there is not, put these aside and create new, plausible scenarios so that there is a wide range of outcomes. There are a few more questions to ask

- a) Are the main future trends all mutually consistent?
- b) Can the outcomes postulated for the key uncertainties co-exist?
- c) Are the presumed actions of stakeholders compatible with their interests?
- d) Assess the revised scenarios in terms of how the key stakeholders might behave.

When done try to reassess and if in need do additional research, re-examine the consistencies, and portray each of in an influence diagram. When this is reiterated construct a believable story to describe the scenarios. If agreed, present the story in line with it and act!

The Foresight Horizon Scanning Centre, the UK Government Office for Science,²⁸ have performed several cross-departmental scenario works within the UK government, to consider the impact of the emergence of new economic and political powers. The Centre proposes that;

- Between 10 and 25 people participate or more depending on the process
- They represent a wide range of expertise
- Different backgrounds with
 - Subject-matter expertise
 - Policymakers and planners that will use the scenarios
 - Operational staff with local, country or regional knowledge

The group states that the value of the scenario planning is limited without the right expertise and they are as all strategy dynamic and should be updated at intervals.

Scenario analysis, as we have seen above 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. That is more understandable if one considers the nature of the economies of today. The Information and Communication Technologies (ICTs) are creating an economy, which is very dynamic and turbulent through what is known as “e-globalization”^{49, 50}

Conclusion

Our knowledge and practical experience make us determined that scenario planning may be utilized to further extend educational experience when dealing with idea evaluation and that this kind of analysis will make it possible to arrive and regional as well as European strategies considering introduction of new innovations and other long lasting change. It is an underused method but it is a powerful tool to use when there is a high uncertainty level in the strategic planning process. Therefore scenario planning should be utilized as it is practical an approach leading to consensus especially in regional development strategies.

Useful links

www.juergendaum.com/news/09_08_2001.htm (Royal Dutch/Shell case study).

www.ibm.com/services/us/gbs/bus/html/bcs_strategyplanning.html (Enterprise of the future. Global CEO Study 2008. Analyses and gives case studies across 10 industry sectors including life sciences).

<http://www.iftf.org/> (Institute for the Future)

<http://www.altfutures-afa.com/about.asp> (Alternative Futures Associates)

www.gsk.com/investors/presentations_webcasts.htm (Andrew Witty's 'progress with strategy' videos)

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