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Future scenarios to inspire innovation

Peter De Smedt [a,*], Kristian Borch [b], Ted Fuller [c]

[a] SVR, Research Centre of the Flemish Government, Boudewijnlaan 30, B-1000 Brussels, Belgium
[b] Department of Management Engineering, Technical University of Denmark, Lyngby, Denmark
[c] Faculty of Business and Law, University of Lincoln, Lincoln, UK

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ABSTRACT

In recent years, accelerated by the economic and financial crisis, complex global issues have moved to the forefront of policy-making. These grand challenges require policy-makers to address a variety of interrelated issues, which are built upon yet uncoordinated and dispersed bodies of knowledge. Due to the social dynamics of innovation, new socio-technical subsystems are emerging, however there is lack of exploitation of novel ideas and sustainable solutions to address these grand challenges. In this paper we argue that issues of how knowledge is represented can have a part in this lack of exploitation. For example, when drivers of change are not only multiple but also mutable, it is not sensible to extrapolate the future from data and relationships of the past. This paper investigates ways in which futures thinking can be used as a tool for inspiring actions and structures that address the grand challenges. By analyzing several scenario cases, elements of good practices and principles on how to strengthen innovation systems through future scenarios are identified. This is needed because innovation itself needs to be oriented along more sustainable pathways enabling transformations of socio-technical systems.

1. Introduction

In the context of this paper, future scenarios can be seen as narratives set in the future to explore how the society would change if certain trends were to strengthen or diminish, or various events were to occur. Future scenarios substantially differ from predictions, i.e., extrapolations or trends, substituting the criterion of plausibility for probability [1]. Scenarios are not equivalent to images of the future, but they consist of images of the future. Images of the future are snapshots of future states, whereas scenarios consist of a logical sequence of images of the future [2].

1.1. Developing and using future scenarios

Scenario analysis is practiced across many domains and is not restricted to specialized futurists or scenario specialists [3]. Developing and using scenarios can contribute at various levels of society by generating appropriate inputs for planning and decision-making and by facilitating dialogues between various stakeholders [4]. The value of the scenario exercise depends on the ways in which the resulting insights are implemented in on-going and forthcoming actions. However, the explicit and direct uses of scenarios in predefined decision-making contexts are just part of a broader social process [5]. Also important indirect and diffuse links exist between developing and using scenarios and orienting innovation systems and research priorities [6].

* Corresponding author. Tel.: +32 2 5535785; fax: +32 2 5535808.
E-mail address: peter.desmedt@dar.vlaanderen.be (P. De Smedt).

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Developing and using future scenarios can:

- contribute to society's strategic intelligence by stimulating future-oriented thinking and by widening the perspectives and knowledge base of researchers, policy-makers and business decision-makers.
- be useful in creating a common language and understanding between the various interest groups.
- create and support a systemized negotiation process among key stakeholders (social actors).
- be helpful in engaging decision-makers in specific issues, legitimating a chosen course of action, and supporting fruitful debates among stakeholders.

Although the use of scenarios has gained much adherence, its subjective and heuristic nature leaves many academics and decision-makers uncomfortable [7]. How do we know whether we have credible and salient scenarios? And how does developing and using scenarios lead to the expected direct and indirect inputs for orienting innovation systems? These concerns are legitimate and the use of scenarios would gain in academic standing if more research were conducted on their comparative performance and underlying theoretical premises [7]. While the scenario literature makes explicit the methodological differences and similarities of various approaches, it tends to pay little attention to the underlying epistemological assumptions [8]. For example, scenarios that imaginatively represent plausible futures will meet resistance if they are used as predictions.

1.2. Grand challenges

The aim of this paper is to initiate a discussion on how scenario analysis can help to better cope with the grand challenges and to disclose some principles by which scenario processes can inspire innovation. Today's grand challenges – from climate change to unemployment and poverty – go beyond economic and social policies [9]. Grand challenges are usually interrelated and operating at a global scale [10]. Often it is not clear what the real causes are and different policy options are competing, causing shifts in problem perception and priority setting. One result of the above described complexity is a type of uncertainty about the future, an uncertainty whose distinctive feature is disagreement among experts and stakeholders about the long-term consequences of present-day innovations [11]. In addition, uncertainty increases as policy targets move progressively further from the present and it is uncomfortable: fear of the unknown generates resistance to change [12]. But also efforts to control, manage, and engineer the future produce increased uncertainties [13]. For instance, developments in science and technology have a strong potential to influence social change. There are, however, many reasons why the practical use of scientific knowledge and technology varies widely between countries. Societies differ, just as economies, and governments deal with international scientific developments in different ways through the policies they pursue [14]. This analysis indicates that policy and systems of innovation are shaped by social, cultural and political power as well as by technological rationalism and such indeterminism makes systemic approaches to innovation policy far from linear or predictable.

The recent economic crisis reminds us of the importance of mobilizing science, technology and innovation not solely for generating economic benefits, but also for anticipating and responding to the grand challenges [15]. At a strategic level, the European Union took up this challenge via the Innovation Union Flagship Initiative as part of the Europe 2020 strategy launched in 2010. This initiative is an example of a strategic approach integrating research and innovation instruments and actors to tackle the "innovation emergency" related to the grand challenges the European Union is facing [16], p1. Futures thinking is an essential element of developing such a strategy. For example, Hamel and Prahalad [17] emphasize that strategy should draw up consistent visions of the future. In addition, several scholars state that scenarios constitute a major tool for considering the future in strategic planning [18–23].

The traditional concepts and models of innovation are not always adequate to embrace the complexity for addressing the grand challenges [10,15]. Grand challenges require that policy-makers address a variety of interrelated issues, which are built upon as yet uncoordinated and dispersed bodies of knowledge. It has been well documented that the innovation process is interactive including a multitude of short-term and long-term feedback loops between the different stages of the innovation process [15,24]. Looking at the grand challenges, innovations are not only contributing to the solutions. Innovations in the past have been also part of the current unsustainable trends. Therefore innovation research needs increasingly be oriented towards the challenges presented by environmental complexity and socio-economic turbulence [25].

In order to investigate how scenario analysis can help better cope with the grand challenges and inspire innovation, we analyze several scenario exercises to better understand the role future scenarios can play as a tool for orienting innovation systems. The remaining sections of this paper are organized as follows: Section 2 sets out the methodology of how we use reflexive inquiry to analyze the scenario case studies. Section 3 describes how we conceptualize inspiring issues and paradigms from different scientific disciplines such as business and innovation research, futures studies, sociology and policy analysis. These concepts and paradigms are then used to analyze the selected scenario case studies. For example, we look how the applied or perceived modes of thinking about the future and multiple stakeholder values are initiating enablers or barriers for the scenario process. In this paper we argue that this kind of reflexive inquiry can and does provide a sound basis for challenging current practice, learning from experience and better articulating our underlying theoretical premises. The outcomes of this inquiry are presented in Section 4 including also implications for practitioners by elaborating elements of good practices and areas of improvement. In Section 5, we further discuss our findings addressing how scenario practice can orientate innovation systems in the view of the grand challenges. Finally, in Section 6 we summarize our findings and conclude with suggested points of departure for further research.