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Multi-layered foresight: Lessons from regional foresight in Chile



Mikko Dufva^{a,*}, Totti Könnölä^b, Raija Koivisto^a

^a VTT Technical Research Centre of Finland Ltd, Tekniikankatu 1, Tampere, P.O. Box 1300, 33101 Tampere, Finland

^b Insight Foresight institute (IFI), Avda Concha Espina 8-1, Dcha, 28036 Madrid, Spain

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ABSTRACT

The design, management and evaluation of foresight is challenging firstly due to the vast diversity of foresight practices and secondly due to its embeddedness in the context of other policy processes. To help overcome these challenges we look at the contributions of foresight from multiple perspectives in a systemic way and propose the concept of multi-layered foresight, which analyses the contributions of foresight to knowledge, relations and capabilities on four layers: landscape, system, organisation and individual. We construct these layers building on earlier literature and illustrate them with a case example from the region of Antofagasta in Chile. We argue that foresight exercises benefit from considering multiple levels and respective different emphases in analysis. For instance, on the landscape layer the focus tends to be on contributions to knowledge while on the organisational layer it is more on capabilities. The layers help position the foresight exercise and its effects in relation to the broader context. Thus, we expect the concept of multi-layered foresight to support the design, management and evaluation of foresight.

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1. Introduction

Foresight is used in national, regional and organisational contexts to anticipate the changes in the environment and create responses to them (Georghiou & Keenan, 2006; Uotila, Melkas, & Harmaakorpi, 2005; Rohrbeck, 2011). While the focus was at first on rationalist technology forecasting, the domain in which foresight is applied today covers science and technology policy, innovation system performance, organisational future-orientation and societal challenges (Rohrbeck, 2011; Von Schomberg, 2002; Salo, Konnola, & Hjelt, 2004; Miles, Harper, Georghiou, Keenan, & Popper, 2008; Kuosa, 2012; Andersen & Andersen, 2014). As the domain has broadened, the definition of “foresight” has become more ambiguous and generic (Miles et al., 2008; Da Costa, Warnke, Cagnin, & Scapolo, 2008; Harper, 2013; Hines & Gold, 2013), which has led to the use of more specific terms such as “fully-fledged foresight” (Miles, 2010), future-oriented technology analysis (Cagnin et al., 2008), corporate foresight (Rohrbeck, 2011), strategic foresight (Slaughter, 1997), innovation system foresight (Andersen & Andersen, 2014; Andersen, Andersen, Jensen, & Rasmussen, 2014), and national, regional and sectoral foresight studies (e.g. Georghiou & Keenan, 2006; Uotila et al., 2005; Grupp & Linstone, 1999). In addition, the terms within foresight are used to mean slightly different things (van der Helm, 2006). Still, several shared perspectives remain on the purpose, goals and contents of foresight.

* Corresponding author.

E-mail addresses: mikko.dufva@vtt.fi (M. Dufva), totti.konnola@if-institute.org (T. Könnölä), raija.koivisto@vtt.fi (R. Koivisto).

At the same time foresight has become more contextual and further embedded in policy processes (Harper, 2013). Foresight is seldom an end in itself, but rather a supporting and complementary process to other activities, such as policy making, strategic planning, priority setting or capacity building (Georghiou & Keenan, 2006; Miles, 2012). In addition, foresight has evolved from merely informing policy to being a policy instrument in itself (Da Costa et al., 2008; Habegger, 2010). A similar shift is observed to some extent also in the domain of business, where the practice of foresight has become more contextual and participatory (Daheim & Uerz, 2008).

The diversity of foresight practices, the emphasis on context, and the linkages to other policy processes have led to a situation where the management of a foresight process becomes challenging (Könnölä, Ahlqvist, Eerola, Kivisaari, & Koivisto, 2009). The planning and implementation of foresight can benefit from a multi-faceted approach, which looks at the different rationales and functions of foresight in a systemic way (Harper, 2013). This leads to our research question: *how can the effects of foresight be structured in a systemic way taking into account the differences in the foresight approaches?*

To answer the research question we elaborate on the concept of multi-layered foresight that perceives foresight principally as a system of knowledge creation constructed of four archetypal layers: landscape, innovation system, organisation and individual. To position the exercise and its contribution in a wider context, we suggest that these layers can be observed through three facets of foresight: knowledge, relations and capabilities. We relate our construction of the facets and layers of foresight to effects and benefits addressed in the foresight literature and illustrate them with a case example from a regional foresight exercise in the region of Antofagasta in Chile. We also emphasise some neglected aspects of foresight, such as capacity building. While some studies exist on the contribution of foresight to capacity building of individuals, these aspects need to be studied further as an integral part of foresight rationales. All in all, we expect the concept of multi-layered foresight to provide structure for the design, management and evaluation of foresight.

The article is structured as follows. After this Introductory section, in Section 2 we describe the rationales and contributions of foresight mentioned in the literature on the four layers using the facets of foresight. Section 3 illustrates the layers and the facets with a case example. Section 4 discusses the dynamics between the layers and Section 5 concludes.

2. Multi-layered foresight

2.1. Facets of foresight

While much of the discussion on the benefits (e.g. Irvine & Martin, 1984; Martin, 1995), functions (Da Costa et al., 2008) and objectives (Salo et al., 2004; Barré, 2002; Van der Meulen, De Wilt, & Rutten, 2003) of foresight has been driven by empirical observations, it can be argued that they relate to the notion of foresight creating new knowledge (see, e.g. Eerola & Miles, 2011). Further theoretical linkage can be made in particular with evolutionary and institutional economics, which consider knowledge as a consequence of interaction between individuals, organisations and their environment. Herein, the knowledge resides also in habits, routines (Hodgson & Knudsen, 2004) and skills (Nelson & Winter, 1982), thus pinpointing the importance of engagement of people in learning and participatory processes in foresight. Building upon the work of Barré and Keenan (2008) and Van der Meulen et al. (2003), Salo et al. (2004) coined three interdependent foresight objectives: (i) improved systems understanding, (ii) enhanced networking and (iii) strengthened innovation activities. From these objectives and the premises of knowledge creation we can derive three general dimensions of foresight contributions named facets of foresight: (i) knowledge (ii) relations and (iii) capabilities (see also Table 1).

2.1.1. Foresight creating knowledge

Perhaps the most defining characteristic of foresight is its orientation towards the future or long-term developments (e.g. Miles et al., 2008). While foresight systematically gains insights about alternative futures, it also improves understanding of the present and fosters participants to (re-) position themselves in the innovation system. In particular, foresight produces knowledge about alternative futures. This knowledge is different from the knowledge about the present or past in that it is contingent on present actions. Foresight can produce forecasts, descriptions of future possibilities or perceptions of the future, and an understanding of the consequences of actions (Eerola & Miles, 2011). This knowledge can then be used to, e.g.,

Table 1
Three facets of foresight.

Facet	Definition	Examples of effects
Knowledge	The production of new knowledge and insights about possible future developments and the consequences of present actions that help stakeholders to (re-) position themselves in the innovation system	Improved understanding of future developments articulated as forecasts, scenarios, roadmaps, weak signals, wild cards, emerging issues and recommendations
Relations	The creation of new connections between different stakeholders and across sectors, and the restructuring and enhancing of existing networks	Alignment of stakeholders (e.g. from industry, research and public sector) into joint envisioning, new contacts, enhanced networks
Capabilities	The learning of new capabilities that contribute to the future orientation of an organisation and the system at large	Changing habits and mindsets, and learning new skills and methods, which strengthen foresight and innovation capabilities

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