

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

## Technological Forecasting & Social Change



# Exploring the cognitive value of technology foresight: The case of the Cisco Technology Radar

Siri Boe-Lillegraven <sup>a,c,\*</sup>, Stephan Montere <sup>b</sup><sup>a</sup> Aarhus University, School of Business and Social Sciences, Department of Business Administration, Bartholins Allé 10, 8000 Aarhus C, Denmark<sup>b</sup> Cisco Systems, Inc., Corporate Development, Business Development, Avenue des Uttins 5, 1180 Rolle, Switzerland<sup>c</sup> The Sino-Danish Center for Education and Research, Beijing, China

### ARTICLE INFO

#### Article history:

Received 1 July 2013

Received in revised form 27 March 2014

Accepted 29 July 2014

Available online 13 October 2014

#### Keywords:

Organizational future orientation

Technology foresight

Technology radar

Cognition

Decision-making

Dual process theory

Mental models

### ABSTRACT

There is much literature on how corporate foresight should be practiced, but fewer explanations of through which mechanisms it creates value. We seek to deepen this understanding by applying a cognitive lens. We mainly explore how and why foresight can influence ways of processing information, first conceptually and then empirically through the case of the Cisco Technology Radar. Through consulting multiple individuals, opposed to focusing solely on statements from top managers or observable outputs on the firm level, we uncover a broad set of “hidden values” from this technology foresight initiative. We conclude that a critical mechanism of a system such as the radar is its probing of analytical thinking, as well as its way of making people connect and exchange views across functions and departments. We also observe that deeper and more frequent involvement corresponds with greater perceived value of the system. Our findings have implications for research seeking to further understand through which mechanisms foresight creates value, and for the practice of designing, implementing and motivating for participation in technology foresight.

© 2014 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

## 1. Introduction

By the end of 2012 the Cisco Technology Radar – a foresight system for identification, selection and verification of emerging technologies (Rohrbeck et al., 2006) – was widely considered a success. This was not only due to the several hundred scouted technologies. More importantly, the technology reports were increasingly spotted on the tables of key decision-makers within the company. The radar scouting process also arose considerable interest from external clients. Still, as one of the authors can personally testify, people kept asking for the ultimate “proof” that the radar created value. “So what”, they asked. Where was the story of the technology that thanks to the foresight system had been turned into a successful business?

Where was the profitable innovation that would never have happened had the radar project not existed? Exactly how or why did the technology foresight system make a difference?

Generally, foresight is known to bring value through different roles; exploring new business fields (strategist role), increasing the number of innovation concepts and ideas (initiator role) and increasing the quality of the output of innovation projects (opponent role) (Rohrbeck and Gemünden, 2011). Research within the scenario foresight literature also specifies the usefulness of foresight for changing mindsets and decision-making styles, which is important for enabling managers to realize the need for change and take action. However, direct links between the role of foresight and specific outcomes can be hard to establish. This was also the situation with regard to the Cisco Technology Radar. True, some of the technologies that have been sourced by Cisco could be tracked back to the scouted technology reports. Proving that it was the radar initiative that made the difference was still hard. In a large multi-national company there

\* Corresponding author at: Bartholins allé 10, 8000 Århus C, Denmark. Tel.: + 45 24247457 (cell), + 45 84165028 (office).

E-mail addresses: [Siri@badm.au.dk](mailto:Siri@badm.au.dk) (S. Boe-Lillegraven), [smonterd@cisco.com](mailto:smonterd@cisco.com) (S. Montere).

are thousands of internal and external factors impacting the organization. Even if all those variables could be controlled for, the effort required to measure the impact of the radar would be too demanding and costly.

In Cisco, the people responsible for the radar were more distracted than truly disturbed by the “So what?” question. They considered other factors as proof enough that the foresight system was creating corporate value – for example that more and more people asked to be involved and that certain departments requested tailored versions of the process. It was still hard to describe this kind of value more accurately. “They really like it!” is hardly a satisfactory answer to the “So what?”-question. Or is it?

In the broader literature on strategic management there has been a growing interest in the role of cognition – or managerial mindsets – for enabling change. In this paper we make an effort to further specify how and why the technology radar makes a difference by looking into cognitive aspects of foresight. Instead of searching for examples of technologies, products or services that were sourced and developed thanks to the foresight initiative, we are in this paper focusing on the potential role of technology foresight for changing *mindsets* and ultimately, how this relates to value creation. We do this theoretically in [Section 2](#) and empirically in [Section 3](#) by asking the following guiding research question:

*How and why can engagement in foresight impact ways of thinking and processing information?*

In other words, we contribute to the understanding of value creation from foresight by highlighting benefits not likely to be directly measurable through looking at products or other end results, but rather by keeping an eye on the process. This makes it necessary to look deeper than the “corporate level” descriptions of value stemming from foresight, and consider also how individuals might perceive the benefits from participating. Through our framework and analysis we show how systematic probing for analytic thinking through foresight can be a key catalyst for changing mindsets, which will ultimately influence strategy as well as decision-making. We also highlight how the organizational context and the design of the foresight process can catalyze mental model updates.

The paper is structured as follows: First, we establish a theoretical framework from which to approach the case ([Section 2](#)). To help us specify our focus we derive in total 8 propositions – 5 regarding individual and 3 regarding collective aspects of the cognitive role of foresight. After summarizing the propositions ([Section 2.5](#)) we present our case ([Section 3](#)), more specifically the setting and methods ([Section 3.1](#)), the background of the Cisco Technology Radar ([Section 3.2](#)) and our results ([Section 3.3](#)). Finally, we discuss our results ([Section 4](#)), highlight key implications and limitations as well as suggest several avenues for further research before we conclude ([Section 4.3](#)).

## 2. Literature

In the following we theoretically consider not only the final outcomes of foresight, but also its potential for affecting habits and mindsets of individuals and thus creating value by enabling organizational renewal and change. We find that there is a

research gap particularly with regard to three aspects. I) Most current research considering the value of foresight does it on the organizational level – meaning that “deeper” parts of the foresight process concerning the value perceived by individual stakeholders are less accounted for, particularly from a cognitive perspective. II) It is somewhat open whether the link between foresight and mental model change can be established also for activities that do not include scenarios, for instance technology foresight. III) While there are some arguments for why foresight can change mindsets, such as due to the memorability of scenarios, there is lack of a solid theoretical foundation from which to explore the cognitive value of foresight. A better understanding of the collective cognitive process of foresight – what happens when individuals come together as participants in a foresight system – is also needed.

Whetten (1989) refers to theory-development authorities such as Dubin (1978) when listing four essential elements a complete theory must contain; what, how, why and who/where/when (see [Fig. 1](#)). Our aim, in addition to exploring the “how”, is to contribute with further developments especially for the “why” related to the cognitive dimensions of foresight. We are attempting first to build and then to verify the theoretical framework.

In our efforts to identify literature describing the value creation of foresight, and more specifically cognitive factors, we have encountered a problem described by Rohrbeck and Bade (2012) in a recent review: The literature explores similar phenomena, but uses different terminologies. We identified papers describing the value creation of corporate foresight, of strategic foresight, of technology foresight and of specific tools and methods such as scenario planning and horizon scanning. Our empirical study is focusing on a specific case of technology foresight, but we are concerned with processes and mechanisms that can also be found in other approaches to foresight. We therefore felt it would do more harm than good only to consider literature on specific technology foresight tools. Instead, we have chosen to consider a broader literature on value creation from foresight, as long as the foresight dealt with in the papers involves systematic efforts to interpret and look out for the future. We follow the example of Rohrbeck and Bade and consider the larger field we position ourselves within as organizational future orientation. While our empirical study certainly makes our results more relevant for other radar projects or technology foresight initiatives on a more general level, we would argue that our theoretical framework can also serve as input for future research on any organizational foresight effort that takes the form of a widely implemented process, close to the best practices described in the literature (Rohrbeck and Gemünden, 2008).

### 2.1. Current understanding of foresight and cognition

Literature on the value creation of foresight is often concerned with its role for managing uncertainty. For example, foresight systems have been highlighted as a means for identifying drivers of change to handle the effect and response uncertainty through “betting” on discontinuities, or more often creation of strategic options (Vecchiato and Roveda, 2010). Corporate foresight is also seen as valuable for perceiving, interpreting and responding to change as well as influencing other actors and enabling learning (Rohrbeck and Schwarz,

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات