



Integrated roadmaps and corporate foresight as tools of innovation management: The case of Russian companies[☆]



Konstantin Vishnevskiy^{*}, Oleg Karasev, Dirk Meissner

National Research University Higher School of Economics, Moscow, Russia

ARTICLE INFO

Article history:

Received 20 August 2013

Received in revised form 20 April 2014

Accepted 21 April 2014

Available online 16 May 2014

Keywords:

Corporate Foresight

Integrated roadmap

Technology roadmap

Innovation management

Technology management

Market routes

ABSTRACT

The article elaborates an approach of combining Foresight and integrated roadmapping for corporate innovation management. The proposed management instrument goes beyond the existing roadmapping and corporate Foresight approaches by integrating them and showing the interface to corporate strategy building. Corporate Foresight and integrated roadmaps are closely interlinked and show reasonable potential to maintain the current level of organizational innovation culture and also enable future improvements. We propose a new roadmap structure and reveal the main ways to use this technique in business planning. Finally, the paper applies the suggested approach through case studies of major Russian companies in the oil & gas, energy, and aviation sectors.

© 2014 Elsevier Inc. All rights reserved.

1. Introduction

The scientific community is increasingly interested in developing effective methods to analyze and predict potential future challenges. The reason is that industrial and consulting companies developed most approaches to identify potential future challenges and problems; as such, these approaches had a strong focus on companies' actual requirements and needs and were usually developed ad hoc or at short notice. Consequently the known approaches are suitable and applicable for company-specific interests but are mostly characterized by a narrow view of the actual external conditions related to companies rather than considering the overall picture. Thus, the scientific community has developed a number of techniques to solve this problem, one of which is corporate Foresight. A survey of 26 companies with corporate foresight

experience conducted by Reger (2001) illustrates the need for practically-oriented foresight in the corporate sector [1].

Corporate Foresight can have multiple applications and impacts on the overall innovation process. Gracht et al. (2010) argue that Foresight can provide information on the potential environments in which the corporation is active, notably the contribution to product development and the innovation pipeline as an input item for the innovation process [2]. In addition Foresight can contribute to the innovation process itself, e.g. in input terms for stage gate processes which are commonly applied for innovation projects. In this constellation Foresight is used as one of many input data for the assessment of technological progress and technology related feasibility. However we argue that corporate Foresight is also suitable for strategy development in different ways. Hence the understanding of corporate Foresight needs to be extended beyond the information delivery function. Such a view of corporate Foresight is inherent in the assumption that corporate Foresight influences the product development and innovation pipeline or the use of respective information for decision making in the stage gate process. Corporate Foresight has a more influential role to play not only in the overall

[☆] The study was implemented within the framework of The Basic Research Program of the Higher School of Economics in 2013.

^{*} Corresponding author at: Myasnikitskaya st., 18, 101000, Moscow, Russia, Tel.: +7 495 772 95 90x1544.

E-mail address: kvishnevsky@hse.ru (K. Vishnevskiy).

organization of companies' innovation activities but beyond. Accordingly, the role of roadmaps as tools for visualization and priority setting support for strategic decisions needs to be understood.

Until recently, companies rarely used a combined approach of corporate Foresight and integrated roadmapping. This is partially because integrated roadmapping is a rather new conceptual approach combining technology and market roadmaps and because so far, limited evidence exists for the effectiveness and efficiency of corporate Foresight. Furthermore many companies are quite restrictive about how much information they disclose regarding their methodologies and tools used for strategic management, corporate Foresight and especially, roadmapping.

Consequently the following research questions arise:

- What are the limitations of the current research on corporate Foresight and roadmapping?
- How can Corporate Foresight and integrated roadmapping be combined to impact corporate decision making and roadmap/strategy implementation?
- How should roadmaps be structured and integrated into business planning?

The work aims to answer these questions and elaborate fields for future research.

2. Methodology and approach

First, we conducted a literature review to establish the current state of knowledge and the usage of both approaches and the combination of the instruments. We then used the findings of the literature review to develop a combined corporate Foresight and integrated roadmapping approach. Next, we carried out a total of 42 structured interviews with Russian companies on our combined approach. We followed a structured template for all interviews. Following the interviews, we implemented the combined corporate Foresight–integrated roadmapping approach in more than 20 pilot applications. We synthesized the experiences from the pilot applications for future developments of the approach.

The paper is structured as follows. First the literature review outlines recent developments in both areas. The next section introduces the methodological concept for the combined corporate Foresight–integrated Roadmapping approach. The third section shows the pilot implementation using a case study approach. The final section discusses the findings and possible areas for future research.

3. Literature review

Due to the complexity of corporate Foresight and roadmapping the literature review is split into two sections: roadmapping and corporate Foresight.

3.1. Roadmapping

The Roadmapping approach was initially developed and introduced by Motorola in the late 1970s to improve the alignment between technology and innovation [3]. Following this first experience by Motorola, the technique then extended to other innovative large firms including Phillips [4], Royal Mail

[5], Lucent Technologies [6], Corning, General Motors, Lockheed Martin, Erickson and British Telecom [7]. A survey undertaken by Phaal, Farrukh and Probert (2000) estimates that 10% of manufacturing firms (mostly large) have applied technology roadmaps [8]. This demonstrates the wide distribution of this tool. It testifies to the wide dissemination of the tool at the end of the 1990s.

At the beginning of the 21st century, the scope of roadmaps expanded to cover product or technology groups and whole industry sectors. It entailed expanding state involvement in employment roadmaps in public policy. At first governments used roadmapping to promote the development of existing competitive industries. However the next step of roadmapping applications involved using this tool to introduce new and emerging technological solutions to social goals. It makes roadmaps a part of the process of priority setting for a country's social and economic development [9–12].

Although the first roadmaps were developed in the 1970s, significant methodological progress was only achieved in the 2000s when Rob Phaal and colleagues published their practical 'T-plan' workbook [13]. Since then, a number of modifications to Phaal's approach [6,14,15] have appeared but the basic concept has remained constant.

There are two main directions of roadmapping – the market pull and technology push approaches. The first considers market demand as the major driver of R&D [6,7,13,15,16]. The latter starts with the most important technologies and tries to identify the market needs that could address the challenges arising from the use of the new technologies [7,17–19].

The continuing rapid expansion of the available science and technology base imposes an increasing need for fast and coordinated decision-making while maintaining the quality of these decisions. To do this, corporations are required to have clear action plans for given situations, and therefore, possible scenarios. Thus there is a need for specialized tools that enable corporations to identify concrete steps to achieve the desired results in the future. The growing demand for such tools led to the emergence of corporate roadmaps. A roadmap is a visual reflection of the different scenarios and the implications of these events. Managers appreciate its visual and schematic approach as it helps them more rapidly understand and analyze the roadmap. Such time-saving is particularly important when there is a need to minimize decision making time [20].

In line with the diffusion of publications on the application of roadmap methodologies as evidenced by the significant number of articles, roadmaps for sectors and regions were developed. As shown by Phaal there are more than 2000 public-domain roadmaps [21]. The simultaneous emergence of both practical and conceptual publications allows us to conclude that roadmapping as a conceptual tool has constantly been improved and modified in line with the nature or scope of the industry.

Comparative statistics suggest that the analysis of the practice of roadmaps has attracted researchers' attention more than the theory. However it should be emphasized that applying roadmaps (for example, the theoretical concept which includes a reasonable number of algorithms) strongly depends on practical knowledge and observations as inputs to the algorithms.

Therefore a reasonably large empirical basis for theoretical study of the principles of roadmapping is required. These

متن کامل مقاله

دریافت فوری ←

ISIArticles

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