Technological Forecasting & Social Change xxx (2013) xxx–xxx

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage:

Novels and novelty in trend research — Using novels to perceive weak signals and transfer frames of reference

Jan Oliver Schwarz [a,*], Rixa Kroehl [b,1], Heiko A. von der Gracht [b,1]

[a] Aarhus University, Business and Social Sciences, Department of Business Administration, Haslegardsvej 10, 8210 Aarhus V, Denmark
[b] Institute for Futures Studies and Knowledge Management (IFK), EBS Business School, Konrad-Adenauer-Ring 15, 65187 Wiesbaden, Germany

ARTICLE INFO

Article history:
Received 10 November 2012
Received in revised form 7 September 2013
Accepted 13 September 2013
Available online xxxx

Keywords:
Science fiction prototyping
Weak signals
Trend
Novels
Frames of reference
Sense-making

ABSTRACT

Science fiction (SF) prototyping uses fictional stories about the future to investigate the implications of science and technology not yet feasible at present. Since such a setting enhances creativity and perception, it has been identified as a means to develop new products, services, and business models. Novelty starts with weak signals of change within an environment and leads to innovations. From a constructivist perspective, in which knowledge needs to be processed or "constructed", weak signals of change are not perceived by the outside environment. Rather, they have to be conceptualized in a cognitive process. We use this theoretical perspective to illustrate the value of novels in identifying and cognitively conceptualizing weak signals. With the support of sense-making theory, we illustrate how novels contribute to comprehending novelty in two frames of reference: by broadening the perspective, enhancing the creativity, and increasing the sensitivity of managers/corporate decision makers to detect weak signals; and by ensuring that the customer comprehends the link of an SF prototype to a future product or service. Our theoretical considerations are illustrated by an example from the novel, *Super Sad True Love Story*, in which the SF prototype is part of a broader fictional story.

1. Introduction

Minor changes in the business environment can evolve into major trends or herald the next innovation and can therefore be decisive for the success or failure of a company [1]. Such modest developments are called weak signals because they are not immediately obvious and are difficult to identify [1]. Due to their potential impact, they play a considerable role in corporate foresight.

Ansoff [2] first introduced the concept of weak signals and thus laid the basis for trend management [3]. Ansoff's [2] concept aimed at detecting indicators of environmental changes early that could lead to strategic surprises and events, which have the potential to jeopardize an organization's strategy. He described weak signals as external or internal signs, occurrences, and developments too immature to precisely assess their impact or complete reactions [4]. A weak signal can also be perceived as an upcoming trend.

However, how can companies benefit from detecting weak signals if we assume that the future cannot be predicted, it can only be shaped? What does this imply for organizations trying to detect and make sense of weak signals in their environment earlier than competitors in order to create and sustain competitive advantage? Furthermore, how can companies distinguish between significant and insignificant weak signals? From a corporate perspective, what makes weak signals attractive or worthwhile to invest in? And how can companies safeguard themselves from disregarding relevant weak signals and reduce blind spots?

One challenge for companies appears to be how to link weak signals to the world of the customer, in respect to designing products and services. However, we cannot predict

* Corresponding author. Tel.: +45 89 97895072.
E-mail addresses: mail@joschwarz.com (J.O. Schwarz), rixa.kroehl@ebs.edu (R. Kroehl), heiko.vondergracht@ebs.edu (H.A. von der Gracht).
[1] Tel.: +49 611 7102 2100; fax +49 611 7102 10 2199.

0040-1625/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.techfore.2013.09.007

the future. We need to find creative ways to imagine a variety of possible futures. In a sense, identifying and analyzing weak signals require individuals to imagine how weak signals could evolve in the future and how they can impact other developments or be linked to new or existing products or services. Thus, creativity, openness, sensitivity, receptiveness and an open mind are central in the search of weak signals [5]. This notion implies that creativity is vital for organizations. The challenge appears to be twofold: creativity and thus perception must be enhanced in order to detect weak signals; and the identified weak signals must be made relevant to the customer, or related to how the customer constructs his or her view of the world.

Davies and Sarpong [6], drawing on Chia [7], argued that art and literature can contribute to developing foresight since they address uncertain and social phenomena. Moreover, the authors contend that this aspect has been widely overlooked in research. Furthermore, the argument has been made that cultural products – such as novels, movies, comics, or works of contemporary art – can be used to assist organizations in developing strategic foresight [8–11]. More specifically, science fiction based on science fact can be applied not only to imagine the future but also to further develop new technologies, products and services. Science fiction can also be employed to explore the implications of future technologies. Therefore, science fiction prototyping (SF prototyping) can support corporate management [12].

In this paper, we determine how SF prototyping, or the use of fictional stories of the future to test scientific implications, can be implemented to detect weak signals and how organizations can benefit from SF prototyping. In answering these questions, we strive to explain how SF prototyping encourages creativity in an organization and serves as a source of reference to customers. Our objective is to introduce SF prototyping as a vehicle for managing weak signals more effectively. We support the double function of SF prototyping: detecting weak signals and making sense of their context for the customer. Since this is a novel approach to managing weak signals, we cannot apply a case study. However, by drawing on several theoretical fields we support our argument and illustrate our idea by providing an example of an SF prototype.

The remainder of this paper is organized as follows: we discuss weak signals from a constructivist perspective, elaborate on the concept of SF prototyping, and discuss how organizations can apply both. We present our ideas of how SF prototyping can influence frames of references and discuss an example of an SF prototype taken from the novel *Super Sad True Love Story* [13] in more detail. We draw conclusions, identify limitations, and make suggestions for future research.

2. Weak signals from a constructivist perspective

A constructivist perspective of weak signals is adopted for this paper because it supports in explaining why weak signal identification and management differ in scope among companies over time. Constructivism assumes that individuals do not have direct access to an *absolute reality* [14] that is independent from cognitive statements [15]. Statements about reality are entirely based on individual and subjective impressions [16] and are highly influenced by individual experiences [17]. Cognitive statements about reality are thus always subjectively constructed [18]. Individuals create their own *subjective reality construction* [19], or picture of the world in their minds, from how they individually perceive impressions.

The perception of weak signals is influenced by different factors. After examining the literature on trends and weak signals, Rossel [20] found it to be surprising how many authors do not recognize that the concept of weak signals is only a metaphor. Rossel [20] referred to weak signals, not as tangible language or occurrences, rather as intangible related concepts and processes, developments, shifting influences, and dynamic cultural changes.

Seidl [21] introduced a constructivist perspective to determine weak signals, which has been highlighted by other scholars in the field [e.g. 22, 23]. He criticized the epistemological assumptions regarding weak signals as being naive in the respect that cognitions are conceptualized as direct representations of the external world. He argued that weak signals would have to be integrated as experiences with one's existing constructions, which indicate future problems in some form [21]. Moreover, Seidl [21] argued that weak signals are not out in the external environment waiting for organization members to perceive. Rather, the signals are perceived differently by individuals because their personal cognitive conceptualization determines their interpretation. Therefore, it is questionable what actually influences a cognitive system, or what determines the perception and interpretation of weak signals.

In addition to the individual level, we would also like to provide insight in the collective level of perception. If individual reality constructions are introduced to the interaction process with other individuals, a socially shared (subjective) reality is created that serves as a basis for actions and behaviors in society [24]. Socially shared reality does not replace or disregard the individual with his individual interpretation background. In a social context, individual reality constructions are influenced by interaction with others and knowledge individuals acquire through this interaction. This interaction and shared knowledge in turn influence how an individual perceives, constructs and interprets the world [24].

The adoption and diffusion of weak signals are thus dependent on social interaction. Rogers' [25] work on the diffusion of innovations can be considered to be the basis for Wacker's and Mathews' [26] life cycle of a trend or of McCracken's [27] concept of “flock and flow”. The premise of these concepts is that weak signals emerge from the fringe of society and may diffuse over time to a mass-market phenomenon, thereby developing from weak signals to strong signals, i.e. trends. However, this also implies that in the process of normalization, a group reconstructs their perception of a weak signal over time, and a product or service previously perceived as abnormal is transformed into normality [28].

In the context of searching for weak signals, this implies that the aspect invention and diffusion are of relevance [28]: Invention refers to identifying what is new and what constitutes new; diffusion refers to the extent to which something new becomes widespread. Hence, searching for weak signals can be understood as researching novelty [28]. From a constructivist perspective, the consequence is accordingly also twofold. The detection of weak signals is dependent on the sensitivity and subjectivity of the observer based on his or her individual experience (invention). At the same time, the adoption of weak

Please cite this article as: J.O. Schwarz, et al., Novels and novelty in trend research — Using novels to perceive weak signals and transfer frames of reference, Technol. Forecast. Soc. Change (2013), http://dx.doi.org/10.1016/j.techfore.2013.09.007