THE ‘CIRCULAR FORESIGHT PROCESS‘

–

integrating ´signposts´ in ´landscapes´ for a dynamic and transparent foresight procedure

by

Tanja Schindler and **Michael Schönmoser**

4strat GmbH | Torellstr. 1 | 10243 Berlin | www.4strat.de | info@4strat.de

Abstract

The primary goal of the approach introduced as ´Circular Foresight Process´ is to develop methodical interaction of Horizon Scanning and Scenario Building. As an integrated system, it mainly provides in-depth data analytics and data monitoring. Further, the paper recommends a software supported analysis of quantitative and qualitative data to increase efficiency and interdisciplinarity. The key benefit is to make the dynamics of empirical evidence visible and to challenge pre-existing scenarios with monitored data and ongoing discussion about occurring impacts. Therefore, the process unfolds the full advantages of an integrated approach by combining Horizon Scanning with Scenario Building identifying and connecting ‘signposts‘ with ‘landscapes‘. Also, the process suggests statistical inference analysis and plausibility, coherence, and validity within foresight projects.

Keywords:

Foresight, Scenarios, Horizon Scanning, Foresight Method, Software Support, Scenario Building, Data Evaluation, Data Monitoring, Statistical Inference, Dynamic Analysis, Criteria of Scientific Theories.

1 Introduction

In recent years, the number of foresight projects has continuously increased [Haegeman, Spiesberger, Könnölä 2017]. Supported by organizations, state institutions, and private companies, the supply followed the rising demand. At the same time, the range of methodological approaches within foresight projects began to expand. In addition to traditional methods, such as Scenario Building, Delphi, Visioning, Road Mapping, or Horizon Scanning, practitioners promoted more creative approaches and new combinations of different methods - the so-called method mix. At present, this results in a comprehensibility problem of the theoretical-conceptual foundations within diverse projects, especially regarding their plausibility, coherence, and validity. Further, the growing amount of empirical data collected and incorporated during the projects makes it more difficult to track the statistical correctness and accuracy - without the traceability of what data and how this data is analyzed. At the level of policy planning and implementation, a significant challenge for policymakers is to address the complex and interconnected nature of the seemingly incoherent social, economic and environmental issues facing modern societies [UNDP 2014]. Therefore, it is necessary to create a comprehensible process for policymakers.

Foresight projects are always new and unique in their approach. Only a few scientific studies are subjecting the projects and their application of methods to comparative monitoring. Since it is not foreseeable which actors will drive the monitoring process, the only option is to solve this problem methodically to make the application and the results comparable (see 2).

To make the empirical foundations comparable through indicators, the use of web-based applications verifies the process' success. To this end, software support enables a continuous update of these indicators if the underlying conditions may change (see 3). Therefore, this paper describes a new circular process which makes the application of multiple foresight methods comparable and subjects the results to continuously monitoring (see 4). As a result, the circular process implies continually updating and validating images of the future.

Foresight calls for coherent factors to be considered within a dynamic process and to anticipate its development. Further, numerous examples prove that the developments of many variables in the long-term are surprisingly regular, as they repeatedly fall on the trend despite temporarily persistent short-term deviations [UNDP 2004]. Hence, this makes it possible to avoid having to frequently start new foresight processes in the event of recurring, dynamic changes in influences

or general conditions. By making the used data and the analysis transparent to the different stakeholders who are part of the subsequent decision-making process the consensus building can be integrated into the foresight process itself (see 6).

The new circular process combines Horizon Scanning activities with the traditional Scenario Building. It includes challenging and re-evaluating pre-existing scenarios as well as developing new scenarios by identifying a set of future-critical indicators (here called 'signposts'). Thus, it provides guidance in challenging and monitoring scenarios at an early stage. Furthermore, it may condense the Scenario Building phase by developing time-related 'landscapes' rather than full scenarios (see 5). This leads to the main idea of introducing a circular process and interlinking identified indicators and trends with future driven 'landscapes'. By using foresight software within the circular process, the evaluation includes an on-going quantitative and qualitative re-estimation by experts and stakeholders. With a continuous data monitoring that includes underpinning and updating scenarios, an agile process evolves that continuously assimilates the topography of the landscape.

2 The current state of research

Applying Strategic Foresight aims to stretch our biased mindsets and stimulates critical thinking as it invites us to think and to pursue preferred futures while avoiding undesired futures. It generates agile strategies highlighting the consequences of our today's actions [Slaughter 1995]. Organizations must identify the driving forces that influence environmental changes and understand their dynamics and interaction. With this, they uncover emerging patterns signaling critical future changes and anticipating essential shifts of events [Martelli 2014]. Because there is no standardized way of doing so, every foresight project is different and needs a reasonable assessment of underlying assumptions and expectations to make them comparable. Foresight projects also vary in their sizes and durations. Some are of immense scale, involving extensive consultation, detailed research and stakeholder workshops to identify and advise on futures policy challenges. Others are smaller, requiring only a single workshop with an internal policy or strategy team to explore what is driving change in the futures and the resolving implications for their strategic plan. The extreme variations in the use of foresight regarding methods, data, and analyses make it difficult to evaluate and monitor the future. Therefore, it is almost impossible to measure the scientific quality of the findings regarding its plausibility, coherence, validity.

A ubiquitous example in the application of a foresight method is Scenario Building. A scenario is a picture and/or a story with comprehensible connections, which links a future state with the present and illustrates significant decisions, events, and consequences in the story [Kosow/Gaßner 2006]. Since the future is unknown, it cannot only describe a single "most likely" image of the future. Instead, scenarios aim to systematically capture consistent and alternative future environments that appear plausible in the context of the identified question. Scenarios can help to develop long-term strategies and plans to improve the perception and coordination of the desired and probable circumstances of the future [Glenn/Gordon/Florescu 2011]. They are widespread in futurology and beyond, but there is often a lack of methodical-critical (self-)reflection of scenarios [Steinmüller 2012]. Hence, it is important to outline each step of the Scenario Building process in detail. Scenario Building is a Strategic Foresight tool designed to explore and anticipate change by challenging strategists´ beliefs and perceptions [Ringland 2006].

Evaluating *takes a broader scope at all performing aspects, looking at whether the changes and any achievements towards the defined objectives are - at least partial- due to the intervention and why intervention has been more or less successful in achieving its objectives. It looks at what has happened, why something has occurred, and in particular, how much has changed as a consequence.*

Alternative futures strive from various combinations of critical factors and their description in rich narratives. The narratives themselves provide the backbone for discussion of strategic options and recommendations. The shortcomings of scenarios are that they only reflect present assumptions of the future, and their progress depends entirely on technological or social developments. Their factors may include the increase of external risks and internal weaknesses as well as conditions mitigating, adapting to, or overall avoiding crises. For scenarios, the horizons scanning method plays a variety of roles. Horizon Scanning aims to continuously and objectively explore, monitor and assess current developments and their potential implications for the future [Miles/Saritas 2012]. When integrating Horizon Scanning activities into the Scenario Building process, it engenders continuity and gives on-going purpose to scenario narratives [Ramirez et al. 2013]. The method helps to visualize plausible futures based on current trends or signals. Further, it provides a possibility to identify present challenges and opportunities that current decision-makers and organizations are not prepared to address. Finally, this integrated approach

provides context to test the robustness of current assumptions shaping policy and planning [Bishop/Hines/Collins 2007].

***Monitoring** generates data on an intervention's activity and impacts over time continuously and systematically. It helps to identify and to address any implementation problems of intervention at the same time as it generates factual data for futures evaluation and impact assessment. Monitoring is used as an on-going process to challenge the dynamic development of scenarios.*

3 Methodological approach

The primary goal of this paper is to provide a methodology, further described as 'Circular Foresight Process'. The key benefit of this new approach is to make the dynamics of empirical evidence visible and challenge pre-existing scenarios with monitored data and an on-going qualitative discussion on occurring impacts. Therefore, this paper unfolds the full advantages of an integrated approach by combining Horizon Scanning with Scenario Building and identifying 'signposts' and 'landscapes'.

3.1 Advantages of regular Horizon Scanning activities

Although the terms Environmental Scanning and Horizon Scanning are used synonymously, there are some key differences between them. Environmental Scanning focuses on the macro-level environment by applying frameworks such as STEEP or PESTEL and is an on-going process to discover weak signals [Choo 2002]. Horizon Scanning, on the other hand, tries to additionally uncover emerging issues and long-term driving forces within a specific future or scenario context [Miles/Saritas 2012]. Further, Horizon Scanning requires a more data-driven approach identifying and gathering indicators to validate possible future developments [Marsh et al. 2014]. Nonetheless, to anticipate future shifts and events, organizations need to continuously conduct Horizon Scanning activities by evaluating the past and present data and its current dynamics and interactions. This ensures that the gained knowledge finds its periodical application in the decision-making progress. Additionally, it assures that the strategic plan still matches the overall strategy and is validated through existing future scenarios. As such, an overall integrated process, where regular Horizon Scanning activities challenge existing scenarios or pictures of the future, affirms that current decisions still reflect future developments [Cunha 2006].

3.2 Using pre-existing scenarios for enhancing Horizon Scanning

If Horizon Scanning remains an isolated activity at the beginning of a scenario process, its scope focuses solely on current possible futures and their empiric data in the form of weak signals and emerging issues [Rowe et al. 2017]. By using pre-existing scenarios to identify those emerging issues, a broader angle of possible warning signals evolves. Hence, Horizon Scanning underpins the evaluation of whether existing scenarios have already become redundant or need to be updated. Additionally, the approach identifies early signals of change indicating whether the created scenarios or pictures of the future are still valid. In a recent study conducted by Nokia and Statoil, Horizon Scanning activities were linked to the outcome of prior developed scenarios to identify subsequent weak signals [Rowe et al. 2017]. They defined pre-set topic-related search fields to gather qualitative and quantitative information from diverse sources and monitored them supported by a web-based analysis [Rowe et al. 2017]. Consequently, the integration and combination of pre-existing scenarios with Horizon Scanning activities based on identified search fields as counterpart create a robust approach. Further, by combining pre-existing scenarios alongside evidential data of the present and past reduces the underlying biases and assumptions of our current mindsets.

3.3 Including automated Media Analysis in Horizon Scanning activities

To successfully conduct the described approach above, organizations need to assure that they see through the noise embedded in information to avoid their current blind spots [Rowe et al. 2017]. Today's ubiquitous availability of information may overwhelm analysts just by the massive amount of daily generated news. Therefore, a web-based and automated Horizon Scanning algorithm software, e.g., a social media analysis tools, can support analysts to filter and evaluate genuinely relevant data. Another benefit of such web-based activities is that those tools continuously gather data and new information in real-time that may enlighten new challenges in time while simultaneously saving time and resource for organizations.

4 Advantaged of using a foresight software

In addition to social media analysis tools, a supporting foresight software evaluates the accuracy of pre-existing data and information to be able to evaluate current and future states. The advantages of using such software are that it can perform a systematic data analysis by applying

different filters and identifying potentially incomplete, contradictory or non-reliable data or information. Using a web-based foresight software makes foresight processes more efficient by saving resources and time. A software-based approach can also improve the collaboration between internal project members and other external stakeholders. Hence, a foresight software allows to interactively and collectively access data and to evaluate trends and factors with a decentralized expert team. An additional advantage of using a foresight software is that updating and developing scenarios and strategies is transparent and traceable over time. Further, an online tool evolves new reasoning in making sense of the dynamics of identified data and trends and the possibility of an inferential statistic display. Until now, bar charts or pie charts are used almost exclusively for display, which are descriptive-statistical charts whose subject matter is the description of statistical totals or random samples without consideration of estimation or test aspects [Laerd Statistics 2018] which are not relevant for futurology for the presentation of developments. Finally, Scenario Monitoring and Horizon Scanning within single scenarios become faster and more comprehensive.

To support the Horizon Scanning activity, a semi-automated and software supported media analysis gathers relevant information periodically and topic-related. Additionally, horizons scanning activities can be undertaken effortless and save. With software-support, interactions are monitored semi-automated and time-efficient. Thereby, a quantitative analysis, as well as a qualitative discussion, is necessary.

As a result, the methodology aims instead of developing new scenarios from the start every time new issues emerge, to rather build upon already existing scenarios. Therefore, the defined and continuously monitored indicators lead to new or updated scenarios and ‘landscapes‘, shifting the scope of existing or pre-defined scenarios to adapt to the identified issues. Hence, the following methodological approach creates a dynamic process that decision-makers can use and participate in by applying a dialectic knowledge transfer and a holistic analysis.

5 Developing a Circular Foresight Process

The general tasks of every holistic foresight project include desk research, data analysis, interviews, Horizon Scanning activities (incl. Trend-Impact Analysis, Media Analysis, Environmental Analysis), Trend Monitoring, Scenario Building, and strategy or policy development as project output. While foresight projects evolve with every new scenario built, a remaining

challenge is to update pre-existing scenarios with quantitative and qualitative analysis so that they are not becoming redundant. The common approach is to develop possible and probable future scenarios based on trends, whereby on the one hand the trends are not developed but copied and on the other hand - depending on the necessity of the topic to be dealt with - incomprehensible and incomparable developments are projected on the way to the scenarios. Further, the discussion of experts and stakeholders generates two essential processes: it obtains dynamic monitoring and integrates stakeholders in the dynamic changes and challenges. Traditionally, a Delphi is the first step to achieve expert opinions in order to generate the respective influences or to evaluate the respective trends.

In the end, there is a need for a dynamic foresight process describing a circular approach of how to redefine and update existing strategies and policy options within an on-going scenario evaluation and Horizon Scanning activity. The ‘Circular Foresight Process’ aims to develop an incremental and dynamic analysis by extracting indicators from scanned data and pieces of information.

With this, the challenge is to build a methodical interaction of Horizon Scanning and Scenario Building as an integrated system which fulfills plausibility, coherence, and validity within foresight. Therefore, the ‘Circular Foresight Process’ strives from these foundations. As the process is circular, there are two possible starting points.

The first option is to start with the use of pre-existing scenarios. Here the aim is to record such factors and indicators, such as trends, signals or projections in their entirety and to make their analysis comprehensible and valuable. This is enhanced by recording their dynamic developments empirically (through using inferential statistical analysis) and not through mock empiricism. This procedure helps to deconstruct already existing scenarios by monitoring and to challenge their fundamentals regarding today's changes. Herewith, the process initiates the deconstruction to identify their drivers of change, stakeholders, barriers, semantics, paradigms and underlying assumptions. The aim is to determine so-called ‘landscapes’ which underlie the variety of exiting scenarios.

Landscapes are topographic maps to explore possible pathways to alternative futures. Such topographies are drivers of change, stakeholders, barriers, semantics, assumptions, and paradigms. The aim is to develop a strategic pathway to the desired future.

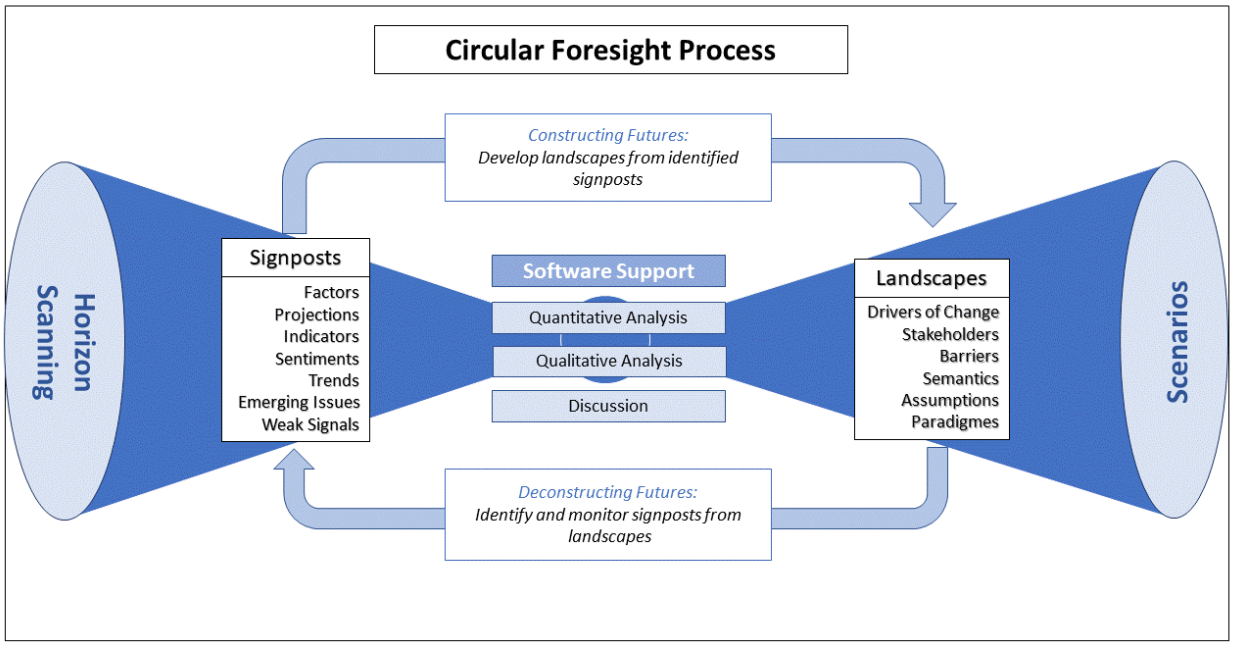

Figure 1: The Circular Foresight Process

Compared to scenarios describing a fixed state of the future, landscapes focus on the developments that occur while stepping from the present towards the future. Hence, they represent a more liquid environment of change factors and how future challenges may evolve rather than a fixed state of the future. Through the description of future developments in the landscapes, it is possible to match influencing impacts of the present, so-called 'signposts' with the identified components (topographies) of a landscape.

Signposts are the sum of the qualitatively or quantitatively detectable and comparable factors trends and projections, which serve as directional preconditions or as indicators for a specific development. They support organizations in making future-relevant decisions today.

A cluster analysis of the results such as projections, trends, indicators, impacts or factors (here so called signposts) from the Horizon Scanning process helps to understand their relations in a specific context (here called landscapes). Horizon Scanning identifies signposts and may suggest their further development. Then, quantitative and qualitative analysis merges gained insights into signposts. Finally, validating and monitoring of signposts check if pre-existing scenarios have already become redundant (factor monitoring) and need to be updated or have to be created entirely new based on the continuing grown insights and assumptions.

The second option is to start with Horizon Scanning activities and to identify trends, factors and emerging issues first, before building from them the directional signposts. Once the action has added new information clustered in signposts, it leads to a holistic and systematic landscape. Therefore, alternative futures and visions of the future are constructed and set the scope of the landscape. The Backcasting method, as well as systems-thinking, enrich the landscape´s topography through, e.g., stakeholders, drivers of change and underlying assumptions. Signposts provide empiric data to enrich the Backcasting with information whether a possible pathway through the landscape has changed. Through this, organizations can decide to make choices actively and change the pathway of the future through their operational actions. The landscape is fluid and provides guidance rather than one strategic solution. Scenarios, visions, or pictures of the future work as a goal and final state of a landscape. Nonetheless, the process started from Horizon Scanning is not necessary depending on a holistic scenario process. Instead, deeper insights are provided by developing the landscape rather than focusing solely on its future destination.

6 Developing strategies and policy options

Coherence and validity within foresight are necessary not to rapture the scientific quality criteria but also to be able to include the policy-makers in the foresight process. On the one hand, policy- and decision-makers have to understand the foresight process to use its results as a baseline for future policy options. On the other hand, the policy and decision makers are the ones who have to implement resulting decisions and necessary changes and, thus, they have to take an active part in analyzing the possible, probable, and preferable futures.

The first condition is secured by setting up the ‘Circular Foresight Process’ in which the so-called signposts are firstly challenged and then updated and monitored. It is not helpful to set up a new foresight process whenever a significant impact occurs. Therefore, a software-supported foresight system will update and monitor the process. The second condition is rewarded by making the data and analysis transparent. A software-supported foresight system will endorse this task as well. When the different stakeholders - who are also part of the subsequent decision-making process and the consensus building - take an active role in the foresight process itself the approach of using foresight methods in a participative way is pleased. If software and web-based tools are used to build and use the instruments for doing this, it reflects the achievement of foresight and exerts it.

7 Results, discussion, and implications

The discussion at the beginning of the paper made the need for a circular and ongoing foresight process clear. Further, an ongoing process is needed to update and monitor the identified signposts regularly. The new approach of creating landscapes rather than focusing on the final state of multiple futures in scenarios offers a time-related view of the future and its progress from the present. Nonetheless, scenarios or fewer complex visions and pictures of the future build the finish line and frame each landscape. They do not become redundant but are an integrative step rather than the only step of developing strategies and policies. Instead of stopping with scenarios and developing strategic options for them, landscapes build a more present related approach to describe the complexity and uncertainty of the future. By using the Backcasting method, not just for each scenario independently, but rather to develop multiple possible pathways through a landscape, policy-makers and organizations become more confident in the understanding of how the future unfolds. With this, they can create and adapt their strategic and policy options to multiple futures without losing the relation to today's dynamic changes and imperative for action.

8 Conclusions

The paper has shown that every foresight project includes repetitive tasks such as desk research, data analysis, expert evaluation, Environmental and Horizon Scanning activities as well as Scenarios Building and Trend Monitoring. While scenarios provide main insights of multiple futures, their creation and evaluation are time and cost intensive. Over-time, the remaining challenge is to reuse pre-existing scenarios by evaluating their redundancy or need to updated multiple views of the future rather than building them new from scratch.

Further, the quality and success of a foresight process depends highly on transparency in data analysis as well as integrating diverse stakeholders, and decision-makers early in the process. The 'Circular Foresight Process' fulfills these condition by challenging pre-existing scenarios and identifying future-critical signposts. The main benefit lies in uncovering dynamics of empirical and qualitative data in relation to existing alternative futures through an ongoing discussion of new occurring impacts. Therefore, this integrative process combines regular Horizon Scanning activities with traditional Scenario Building. The results are landscapes that reflect current decisions and their influence on future developments. Another important prerequisite of a foresight process is its continuity. The circular approach guarantees that neither the Horizon Scanning

method nor the Scenario Building method remains in isolation. Instead, they are challenged periodically over time while putting their results in permanent relation to generate a fluid picture of the future – the landscape. In the end, this dynamic process provides guidance how to build new strategies and policies and how to interact and shape the future. As it is building a bridge between present times and multiple futures (scenarios), it focuses on future progress and change and supports the decision-making process for several time horizons. Being a continuous and integrated system, it fulfills plausibility, coherence, and validity within any foresight project enabling diverse stakeholders to take an active role in the future by making future relevant decisions and creating future relevant policies.

Supplementary, the paper stated that web-based media analysis tools, as well as an online foresight software, support the data gathering, traceability, and transparency of a foresight process. New information is available in real-time and topic related whereas external and internal experts share their qualitative opinion on the future without being limited in time or space. Foresight software makes the analysis and traceability of signposts (indicators, trends, factors, projections or impacts) comprehensible and enables a collective validation of the future.

Finally, the approach of exploring landscapes rather than building new scenarios for each process cycle creates a time-related connection between the present and the future. As foresight deals often with the prejudices of being not relevant enough for current decisions, the ‘Circular Foresight Process’ refutes this statement by providing a visible connection of the present and multiple futures and outlines the required arrangements to established a preferred future. Therefore, organizations become more confident in understanding how futures unfold and what their active part is within.

9 References

Bishop, P., A. Hines, T. Collins (2007). The current state of scenario development, Foresight, Vol. 9, No. 1, pp. 5-25. http://www.samiconsulting.co.uk/training/documents/BishopHinesCollins.pdf.

Choo, C.W. (2002), Information Management for the Intelligent Organization: The Art of Scanning the Environment, 3rd ed. Information Today, Inc., New Jersey.

Cunha, M.P., Palma, P., da Costa, N.G. (2006), Fear of foresight: knowledge and ignorance in organizational foresight. Futures 38, 942–955. https://doi.org/10.1016/j.futures.2005.12.015.

Glenn, Jerome C.; Gordon, Teodore J.; Florescu, Elizabeth (2011). State of the Future. http://107.22.164.43/millennium/2011SOF.html and Salzburg Research. Methodenpool: https://methodenpool.salzburgresearch.at/methode/szenariotechnik/.

Haegeman, Spiesberger, Könnölä (2017). Evaluating foresight in transnational research programming. Technological Forecasting & Social Change, 115, 313-326.

Kosow, H., & Gaßner, R. (2008). Methoden der Zukunfts- und Szenarioanalyse: Überblick, Bewertung und Auswahlkriterien, WerkstattBericht / IZT, Institut für Zukunftsstudien und Technologiebewertung, Berlin: IZT.

Laerd Statistics (last access 05.14.18). Descriptive and Inferential Statistics. https://statistics.laerd.com/statistical-guides/descriptive-inferential-statistics.php.

Martelli, Antonio (2014). Models of Scenario Building and Planning: Facing Uncertainty and Complexity, 1st ed. Palgrave Macmillan: Hampshire.

Marsh, A., Bhagat, A., Muller, A., Clarkson, H., Knowles, H., Park, J., Goodman, J. (2014), Horizon Scanning to Improve Social Impact. The Rockefeller Foundation.

Miles, I., Saritas, O. (2012), The depth of the horizon: searching, scanning and widening horizons. Foresight 14, 530–545. http://dx.doi.org/10.1108/14636681211284953.

Ramirez, Rafael et al. (2013). Scenarios and early warnings as dynamic capabilities to frame managerial attention. Technol. Forecast Soc. Chang. 80, pp. 825-838.

Ringland, G. (2006). Scenario Planning: managing for the future (2nd ed.). Chichester: Wiley; Schwartz, P. (1991). The Art of the Long View: scenario planning: protecting your company against an uncertain world. New York: Doubleday; Van der Heijden, K., Bradfield, R., Burt, G., Cairns, G., & Wright, G. (2002). The Six Sense: accelerating organizational learning with scenarios. Chichester: Wiley.

Rowe, E., Wright, G., & Derbyshire, J. (2017). Enhancing horizon scanning by utilizing pre-developed scenarios: Analysis of current practice and specification of a process improvement to aid the identification of important 'weak signals'. https://doi.org/10.1016/j.techfore.2017.08.001.

Slaughter, Richard (1995). The Foresight Principle: Cultural Recovery in the 21st Century, 1st ed. Adamantine Press: London.

Steinmüller, Karlheinz (2012). Szenarien – Ein Methodenkomplex zwischen wissenschaftlichem Anspruch und zeitgeistiger Bricolage, in: Popp, R. (Hrsg.), Zukunft und Wissenschaft, Springer-Verlag: Berlin, Heidelberg, p. 102.

UNDP (2004). Foresight Methodologies. Training Module 2, Technology ForeSight Initiative Text Book, Vienna. https://www.tc.cz/files/istec_publications/textbook2revisedcf_1171283006.pdf.

UNDP (2014). Foresight. The Manual, GCPSE, Singapore. http://www.undp.org/content/dam/undp/library/capacity-development/English/Singapore%20Centre/GCPSE_ForesightManual_online.pdf.