



Introduction

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For several decades, foresight studies have been receiving more attention in science, economy and politics. Originating from war games and military strategy planning, foresight studies offer a great number of methods to identify potential futures. Rather diverse methods and their combinations have been applied in the last decades in relation to numerous studies and in a great variety of contexts. A solid number of theoretical descriptions, manuals and study results exist, which are written by experienced practitioners. This present volume approaches scenarios from two distinctive perspectives: Firstly, from a special thematic angle and secondly from a methodological angle.

The thematic focus that is present in all given articles is: Security and privacy issues of different kinds. People might think that *Security* is a national issue and doesn't really affect them— but that is a misunderstanding. Security issues are present in everyday life as well as in complex regional or global contexts.

Security issues are omnipresent, if people are aware of them or not. The majority may think about security whilst withdrawing money from an cash machine (ATM) and wondering if anyone is able to spy on their pincode. Only few consider security implications when using new gadgets or think about food supply. In statistical terms, people in Western Countries are more secure than ever before but, rather ironically, feel less safe. That may be caused by an increasing complexity of (inter)national politics or technical systems and devices. It is this increasing complexity at which security research is aiming when future potential security issues are at stake.

The improvement of security measures in aspects of everyday life as well as on national or international levels therefore became one of the leading issues in research and politics. Nowadays, interrelations between people and technical systems are increasingly intertwined *inter alia* by globalization in all fields. The so-called information revolution is a strong symbol for this development. New technologies, international cooperation, climate change or the global markets and traffic can lead to emerging challenges and threats but also new chances – depending on the perception of threats, their assessment and according countermeasures.

Security challenges differ strongly depending on region or the field of interest. Where high-tech systems and devices are common, the Internet of Things (IoT) may cause security implications. In rural areas, water distribution in a disruptive state may be the main challenge. On an international level, the future of forthcoming UN Peace operations may change with significant ramifications. Such examples do have the potential to have serious impacts on day-to-day life – be it on the micro level or the macro level – and are worth shedding light on. To be able to think about future challenges and possible measures to deal with them, it is necessary to look ahead and try to display potential developments – based on existing knowledge and estimates for the future.

What is a serious and useful way to address such challenges? How is it possible to catch the attention of decision makers as well as the general public to a matter? How can identified challenges be discussed properly in order to initiate countermeasures or solutions? This is the point where the methodological focus of this volume comes into play. The challenge is not only to think about the future but to establish a method or procedure for a structured approach, which is accepted by relevant stakeholders.

A number of foresight methods are available and used regularly but one of the most favored is a scenario method. Scenarios differ in style and development process but are meant to enable easy access to complex situations or relationships. Foresight offers reasonable arguments as to why something might happen and something else not. This way, foresight research provides methods to describe (different) potential futures. Such potential futures do not appear out of nowhere but are the product of systematic research and analysis. It depends, however, on the relevant actors if and which one of these materializes actually.

This volume centres upon a special form of scenario that receives increasing attention in research but is not represented accordingly in literature: narrative scenarios. Narrative scenarios combine a number of specifications, which enable implementation in a broad range of contexts. Using different security issues in this volume, the method will be presented through its characteristics, its preconditions and advantages as well as limitations.

Narrative scenarios can be roughly described as short stories, which aim to include relevant aspects of a topic and transform it into a vivid narration with characters in an everyday context. This way, recipients are immersed in the story and the respective characters and are able to perceive a context as much intuitively as deliberately. They focus on a specific problem - and take into account (in a coarse, sketchy way) the wider context.

For security issues, this method appeared to be very useful since future threats or challenges are difficult to communicate through blank statistics or descriptions. Narrative scenarios depict a potential future situation and trigger pictures and images in the mind's eye. They display scenes, which the reader finds easy to perceive and provoke a reaction – ranging from approval to rejection in all its facets. Whatever it may be, the reader thinks about a scenario and wonders if he likes it or not, how he would react or if there is a way to circumvent or counter the threat.

Such mental pictures are important for a comprehensive analysis. Pictures, drawings and stories have a long history in terms of warnings and oracles. They have always been used to warn people about the future – for return and change or as a promise. Dürers' famous *Four Horsemen of the Apocalypse* shows, in warning, the divine apocalypse and the Last Judgment and reminds people of the inevitability of death. The same applies to pictures of the Ten Plagues or other images that are intended to maintain people's belief in a monolith god, a sinless life or other concepts. The mythological Delphic Sibyl became more famous than the practice of interpreting omens from the observed flight of birds (Augury), as in Roman religions. What they have in common is people's desire to be ahead of the future: To be prepared when catastrophe hits or to avoid it completely, to guarantee an afterlife in heaven and not in hell, or to be successful in life. The reasons differed but the intention is similar: To influence the future by "knowing" what is going to happen.

In opposition to historical creations, scenarios do not predict the future or claim to "know" what happens in the future. The only similarity is the approach of being interested in the future and to think about possible developments and according measures to influence it. In contrast to oracles, scenarios develop different images of a potential tomorrow based on different qualitative or qualitative methods in order to facilitate a necessary discussion on future challenges. The scenarios and research projects in this book use pictures and images not to predict, but to transform potential threats into perceivable mental pictures.

Dark scenarios in projects like FESTOS use narratives to depict potential threats in a future society with reason. Like historical dystopias they are intended to shed light on critical aspects, be it intended technological misuse by a terrorist or a looming conflict on water distribution. Today's actions – or non-actions – might have severe consequences in the future, for future generations. By describing different plots, decision makers and people concerned are able to attain a comprehensive understanding, which is a precondition for reasonable decisions.

A timely adjustment of strategies may save resources of all types in the medium or the long run. One of the aims of foresight is to reduce surprises or to be prepared for sudden events and enable a solid course of action instead of ad hoc solutions, which are seldom the best.

Narrative scenarios push their recipients to think about the implications of future events and situations. Scenarios convey sociopolitical questions through narration in a broader context: How do we want to live in the future? Are we aware of the explicit and implicit threats we might face in the future? How can we set the course for a secure and desirable future?

The articles in this book have been gathered to answer the question on how scenarios can be developed based on research experiences and to give a number of examples to show how such a scenario could look and be implemented further.

Often scenario development is described as a theoretical task. In this volume researchers show how they adjusted the theory to fit implementation. Implementation is marked by limited resources (e.g. time, money, manpower) or specific topics (e.g. security, local government). Such limitations lead to specific adaptations of methods and therefore influence the output. All present articles are experience-based descriptions of scenario development written in a way that addresses the formation of scenarios and give samples of the final scenarios or suggest how to utilize them. Most articles are written so that they can be used as an experienced-based manual for scenario development.

It was the intention of the publishers to bring researchers and experts for foresight and scenarios together in one volume with the goal to improve foresight and scenarios through a more frank exchange of experiences, perspectives and visible results with the motive to learn from each other. Mostly, the results of research projects or studies end up being cast aside, into a drawer or elsewhere. What a waste! In order to deliver results to a broader audience and initiate more exchange between researcher, recipients and clients it seems to be necessary to initiate an open discussion on the chances but also the limits of scenarios. In the *lessons learned* chapter we tried to address critical aspects of scenarios and their development and contribute in this way to a more realistic understanding of the power of scenarios.

This book is designed to give an insight into studies executed, which applied foresight methods to gain insights into a potential tomorrow. It describes the objectives of the studies, explains the methods used and procedures which

were implemented to achieve results and ends with lessons learned. In this way, this volume is designed to work as a manual showing examples and including suggestions on how to improve such studies in the future.

All articles reflect a special angle on foresight in the context of security and privacy. They illustrate how scenarios work as a vehicle to raise awareness for security and privacy issues in very different contexts.

In his article *Narrative Scenarios as an Analytical Instrument*, Karlheinz Steinmüller constructs a red line from early scenario works until today. He describes the typology of scenarios and reflects the use of story lines as an artistic form of scenarios. To be a writer on one hand and bound to a specific scenario on the other enables the introduction of contextual backgrounds, everyday behavior as well as action and interaction, which can lead to new insights. In this way, narrative scenarios become an analytical instrument and a “collective learning process”.

Scenarios that tell a Story. Based on this statement, Robert Gaßner and Karlheinz Steinmüller explain the several steps in the development process of narrative scenarios. They present several examples of its implementation and their comprehensive experiences with this technique. The core claim of their experiences is the impact of the process itself, in which the client is involved. By being part of the development, participants are affected by it and the scenarios reach a higher level of impact. However, Gaßner and Steinmüller emphasize that scenarios are meant to work “in the minds of their readers”.

Lars Gerhold and Karlheinz Steinmüller discuss the impact scenarios are able to evolve in their article *Security 2025: Scenarios as an Instrument for Dialogue*. The scenarios themselves are only a part of a wider concept. In the context of future security concepts, threat scenarios were utilized to trigger fundamental questions, how risks are perceived and communicated, assess uncertainty and how politics is embedded in dealing with security concepts. It is stated that “scenarios do not give answers – they ask questions and point out problems”. These questions are a precondition to gain new perspectives and a deeper understanding of the complexity of problems.

The authors Massimo Moraglio, Hans-Liudger Dienel and Robin Kellermann address the important aspect of the utilization of scenarios by looking at a real life market. In *The Didactical Functions of Dark and Bright Scenarios: Examples from the European Transport Industry*, the authors highlight the impact of several dark scenarios on the transport industry market and highlight the

adjustment of the industry as a reaction to them. The dark scenarios successfully displayed a decreasing market for European companies if nothing changes. As a communication instrument scenarios triggered adjustments which enabled a (re)strengthening of the European transport industry in the global market.

One of the core questions regarding the content of scenarios is, how many different futures are they able to display and remain reliable? In *Surprising Scenarios*, Hauptmann and Steinmüller focus on Science Fiction literature as a fruitful source to enrich scenarios. Although science fiction writers are usually more interested in a good story than in scientific accuracy, SF literature places the stories in a regular future social environment and is much more tangible than usual scenarios. By pointing to Wild Cards and Weak Signals, the authors emphasize the usefulness of implementing more un-consensual views in scenarios to challenge usual scenarios and prepare for unlikely but high impact events.

In *The Future of Water Use: Scenarios for Water Management in Telangana*, Jain and Dannenberg show how scenarios can also be used- as a trigger for future visions. These visions were developed through the implementation of an innovative follow-up method: the salon method. Confronted with the increasing problematic context of water distribution in rural India, narrative scenarios were constructed in close collaboration with local experts not only to highlight potential future developments but also to utilize them as starting point for the development of common visions and strategies on how to deal with the problem in the future – in practical but also political ways.

Björn Theis and Stefan Köppe deal with a global security problem in their article: International peacekeeping missions. In *Peace Operations 2025* their scenario process for identifying potential future action in this sensitive field is elaborated. Based on iterative workshops and continuous reflections, key factors, which may influence the development of international missions, could be identified and are presented here,. The detailed explanation of thoughts and decisions during the whole process enables the reader to follow the whole process and gives insights for future works.

Roman Peperhove describes in his article on *The Development of FESTOS Scenarios* the preparation and generation of narrative scenarios in a security research project. The challenge in general and more specifically in security projects is to show not only the first impact of an event which comes to mind, but also side-effects or cascade effects. Besides, the FESTOS scenarios take place in future societies, which had to be reflected. In the article, the whole process

from research design to the finalization of scenarios is explained to enable transparent access to the process and results.

The FESTOS Scenarios contain the four detailed narrative scenarios that were developed in context of the EU-funded security research project FESTOS (Foresight of Evolving Security Threats Posed by Emerging Technologies). Designed as short stories including characters and future daily life contexts, they show vividly the easily accessible complexity of potential misuse of future technologies. This is shown with varying story lines from the vulnerability of future society to emerging technologies and several levels of impact in case of intended misuse.

Liisa Luoto and her colleague Annika Lonkila give a detailed example on how to exploit the explicit or implicit information included in scenarios. *The Use of SWOT Analysis for Future Scenarios* is not only a theoretical explanation but also a critical reflection on the advantages and limits of SWOT for scenarios based on experiences in an international foresight study. Their aim is to evolve the method in order to enable “a more detailed, transparent and systematic analysis of scenarios”. Their concept allows a value-based interpretation of scenarios for better decision making.

Finally, in *Reflections on how to Improve Future Scenarios*, Roman Peperhove discusses a number of critical aspects in the development of scenarios, which go by the board too often. He claims for a more transparent and frank handling of information on the development process in order to increase not only the reliability of the output but also the reputation for foresight as a serious profession.