

## Method Workshop on Constructing Future Scenarios and Using Problem Structuring Methods

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### Overview / Abstract

This workshop aims to give an introduction on the following two techniques and how they may be combined to tackle complex, uncertain and highly interconnected problems (aka 'wicked problems'):

1. Generating scenarios using a modified Shell method
2. Tackling each scenario using Problem Structuring Methods developed in the UK Operational research environment

Given the short time, about 90% of the workshop will be devoted to generating scenarios to the following focus question:

*Europe 2030: How might driving forces in the MENA region affect human migration to Europe?*

The workshop is suitable for all attendees but in particular to those participants involved in long-term planning, contingency analysis, policy and decision makers.

The workshop will employ a mixture of small group work with presentation throughout and particularly at the end when the tutors will give interim results of their analysis and an introduction to Problem Structuring Methods.

### Introduction

Scenario analysis is a process of analysing possible future events by considering alternative possible outcomes (sometimes called "alternative worlds"). Thus, the scenario analysis, which is a main method of projections, does not try to show one exact picture of the future. Instead, it presents consciously several alternative future developments.

In contrast to prognoses, scenario analysis does not use extrapolation of the past. Nor does it not rely on historical data and does not expect past observations to be still valid in the future. Instead, it tries to consider possible developments and *turning* points, which may only be connected to the past. It is useful to generate a combination of an optimistic, a pessimistic, and a most likely scenario. Although highly discussed, experience has shown that around three scenarios are most appropriate for further discussion and selection.

In politics or geopolitics, scenario analysis involves modelling the possible alternative paths of a social or political environment and possibly diplomatic and war risks. In economics and finance, a financial institution, for example, might attempt to forecast several possible scenarios for the economy (e.g. rapid growth, moderate growth, slow growth) and attempt to forecast financial market returns (for bonds, stocks and cash) in each of those scenarios.

Unlike forecasting which extrapolates past and present trends to predict the future, scenario planning is an interactive process for exploring alternative, plausible futures and what those might mean for strategies, policies, and decisions. Scenario planning was first used by the military in World War II and then by Herman Kahn at RAND (“Thinking the Unthinkable”) during the Cold War, before being adapted to inform corporate strategy by Pierre Wack and other business strategists at Royal Dutch Shell in the 1970s. The key principles of scenario planning include thinking from the outside in about the forces in the contextual environment that are driving change, engaging multiple perspectives to identify and interpret those forces, and adopting a long view. There are several steps in scenario planning - each will be briefly attempted in this short workshop. These are listed below:

- Step 0: Focus question: - what we want to explore, understanding our assumptions
- Step 1: Trends – current events, how we got to where we are? (Events: things that happen; Trends: connected events that happen frequently)
- Step 2: Driving forces – understanding forces of change, what’s certain and uncertain? (Driving forces: underlying factors that determine the direction and rate of the trend using, for example, PESTLED analysis)
- Step 3: Impacts and uncertainty: identifying the big issues, what will occur, what might (constructing the impact vs. uncertainty matrix)
- Step 5: Concentrate on developing scenarios for factors with high-medium impacts and high-medium uncertainties
- Step 6: Group factors into super-uncertainties and select two
- Step 7: Look at extremes for each of the two factors and construct scenarios (2 x 2 matrix)

Typically, generating future scenarios takes weeks if not months using experts and data from experts from widely different domains. For example, Global Business Network, a consulting firm specialising in scenario planning, has employed a core group of "practice members", and over a hundred individual network members from a range of different fields, such as Wired editor Kevin Kelly, social media expert Clay Shirky, anthropologist Mary Catherine Bateson, economist Aidan Eyakuze, musician Brian Eno, biotechnologist Rob Carlson, and China scholar Orville Schell to name a few.

In contrast, Problem Structuring Methods (PSMs) tackle the question of what to do with problem now. Whilst they are typically used on tackling current problematic situation of shared concern, they can be used to start planning activities for future scenarios. Many problems in management and science are too “messy” to be addressed effectively by the standard management scientist’s toolkit of mathematically-based techniques. Such problems are typically characterised by complexity, a high degree of uncertainty and ignorance, and multiple subjectivity (wicked problems). Structuring them into a form in which they can be addressed is at least as challenging as formally solving them. These methods are generally designed for use in the context of workshops in which the problem owners are central participants, and tend to emphasise qualitative rather than quantitative content. Similar to scenario planning techniques, several PSMs exist such as Soft Systems Methodology, Strategic Choice Approach, General Morphological Analysis and Cognitive Mapping. A brief outline of each of these will be given at the end of the workshop.

## **Biographies of the workshop leaders**

### **Dr Nasir Hussain**

Nasir Hussain is a regulatory officer at the UK Department of Health's Medicines and Healthcare Products Regulatory Agency. He is responsible for performing risk assessment of medicines, which are associated with clinical, ethical and technical uncertainties. He has co-authored and presented over 50 papers.

In addition, he is the co-founder of Strategy Foresight Limited based at the Dyson School of Design Engineering at Imperial College London. He is a methodologist and facilitator who uses a unique set of advanced decision support modelling methods such as General Morphological Analysis, Monte Carlo Simulation and Multi-Criteria Decision Analysis in addition to scenario planning techniques.

Dr Hussain works with clients in the areas of strategic decision modelling for crisis preparedness, risk mitigation, generating future scenarios and operationalising strategy. In 2014 he developed the world's first web-enabled computer aided morphological analysis as a method for modelling uncertain situations. He has carried out over 40 projects worldwide for structuring complex policy analysis, technological forecasting, business contingency planning and developing future organisational and stakeholder structures. He has published internationally on its applications.

Nasir received his doctorate in Pharmaceutical Chemistry at University College London, where he worked on theories and models of nanotechnology. Later he read for an Executive MBA at City University London developing a risk-reward framework for optimising the construction of a portfolio of licensing deals in the pharmaceutical industry. He has been a lecturer at University of London and a senior lecturer at Kingston University London. Previously, he worked for the pharmaceutical industry. Using Web 3.0 technologies, Nasir's current research resides in healthcare planning and generating and the broader decision support area of connecting islands of decision-making technologies in the development of new business intelligence systems.

### **Professor Dejana Jovanović Popović**

Dejana Jovanović Popović, PhD, is a Professor in Environmental Security as well as Environmental Monitoring and Analysis at the Department of Environmental Protection, Faculty of Security Studies, University of Belgrade, Serbia. She also holds a post in the Faculty of Geography, University of Belgrade. She has a M.Sc. in Clinical Biochemistry and went on for a research project as a visiting scientist at the University of London. She holds a PhD in novel drug delivery systems and toxicology from the University College London. Her post-doctoral research at the UCL focused on the chemical and biological assessment and characterization of nanomaterials. She was involved in several research projects receiving international funding at the University of London. Her research interest involves the environmental and health risk assessment of nanomaterials, (environmental) refugees and water security. She is a Head of the Serbian Standardization Workgroup on Nanotechnology. She has published a monograph entitled 'Environmental Security Trends in the 21st century', 'Environmental Refugees: Concept, Status and Challenges' and is an editor of '*Understanding and Managing Threats to the Environment in South Eastern Europe*' published by Springer.

**Recommended pre-reading**

- Von Reibnitz, U., 1988. Scenario techniques. Hamburg: McGraw-Hill.
- The Hawaii Research Centre for Futures Studies (Manoa School of Futures). Available at: <http://www.futures.hawaii.edu/about-contact.html>
- Article on Alternative Futures at the Manoa School. Available at <http://www.ifs.tku.edu.tw/14-2/A01>
- Future Agenda: the world's largest open foresight initiative. Available at <http://www.futureagenda.org/>
- European Foresight Platform. Available at <http://www.foresight-platform.eu/community/forlearn/how-to-do-foresight/methods/scenario/>