**Scenario Methods – an Introduction**

Scenario methods originate in the strategic planning of the US Air Force after World War II. One of these air force planners (Hermann Kahn) later adapted the scenario approach as a business planning tool in the 60s in the context of the oil price shock. It helps the enterprises to develop different strategies for an unpredictable market.

Peter Schwartz and colleagues later extended the use of scenario methods for planning processes in governments and nongovernmental organizations. They are used in all fields of science and society where strategic planning depends on assumptions concerning the future, for example climate change, technological impact assessment, demography or regional planning and development.

As scenario methods are broadly used, the term scenario is somewhat used in an inflationary way, and there are lots of different definitions available. The following definition is given by the intergovernmental Panel on Climate Change:

“Scenarios are coherent, internally consistent and plausible descriptions of a possible future state of the world. They are not a forecast and this is an important attribute; rather, each scenario is one alternative image of how the future can unfold.”

The scenario method is not a precise but an argumentative approach to future conditions, which are described rather (but not urgently) in a qualitative than quantitative manner. It therefore often takes the form of a narrative. The main components of this description or narrative are clearly stated assumptions about the critical key factors or drivers of a system. But a scenario is not only the description of a future state but describes also the path of progression from a current initial state to the stated future condition. And this development path is the most interesting point to adapt measures or take countermeasures.

As stated before one important characteristic of a scenario is that it must be physically and politically plausible, this means it must be plausible concerning the natural and societal framework conditions. Plausible scenarios provide logical descriptions and explanations of possible happenings.

A scenario should also be internally consistent with the driving forces representing it. Nevertheless the developed scenarios should differ from each other substantially to avoid redundancy and to cover most of the possible future states. On the other hand they should not be too wildly extreme.

Useful scenarios should also be creative since the scenario development process itself is a creative process and should give room for divers and innovative thinking.

As the future is not a static continuation of the past, several potential futures are possible from a particular point in time. One advantage is that scenarios provide a dynamic view of the future by exploring various pathways of change, that lead to a number of possible alternative futures. This enables to evaluate possible future events through the consideration of alternative possible, though not equally likely outcomes of scenarios.

From today on future may unfold in different directions and by developing a few distinct scenarios there is the hope to cover a lot of possible, in the sense of thinkable futures to be prepared whatever will happen. The application of scenario methods forces to think of alternatives. The consideration of alternative possible, though not equally likely outcomes of scenarios enables to evaluate possible future events.
Scenarios do not replace forecasts or predictions, but they help in cases where no quantitative data are available. And the other way round predictions can be part of scenarios and complement them. Scenarios may be described as holistic. As they do not need precise data, it is not necessary to reduce complexity and that’s the reason why they take into account the interactions of many different components of a complex system. Scenarios enable to handle uncertainty as they allow a creative and flexible view onto the future. Ideally, scenarios base on the inputs of both stakeholder and experts, so that the scenario development process may bridge the gap between scientist and stakeholders.

Peter Schwartz summarizes the question, what good scenarios are as followed.

“You can tell you have good scenarios when they are both plausible and surprising, when they have the power to break old stereotypes, and when the makers assume ownership of them and put them to work. Scenario making is intensely participatory or it fails.”

Some authors argue that the purpose of scenario development is not only the result but the process itself, which creates a new understanding of the underlying processes and effects. One result of scenario development is the articulation of a common view of the future, which is the basis for all strategic planning. The following points are variations of one theme: to be prepared for future change und to take or adapt measures respectively countermeasures timely.

- Scenarios allow implementing strategic planning for impacts outlined by resultant alternative futures.
- Scenarios provide the means to anticipate coming change and prepare for it.
- Scenario applications allow for the exploration and evaluation of alternative futures by assessing the possibilities for adaptation of measures.
- Scenarios increase the ability of making more coordinated and better-informed decisions.

According to the different purposes of scenario development there are different types of scenarios defined. But all in all one can distinguish two main types:

**Exploratory** scenarios are of descriptive nature, they describe the future according to known processes of change and given extrapolation from the past. These are scenarios with no major intervention or paradigm shift. As the perspective is generally from the present to the future, they are also called forward scenarios.

**Anticipatory** scenarios are based on different desired or feared visions of the future. They correspond to a specific future that is achievable or avoidable only if certain events or actions take place. Here the conclusions for the development process are in most cases derived from the future, so they are called backward scenarios.

In most cases it’s suitable to have a reference scenario also called base-line scenario. This can be either the status quo, which is in fact no scenario, or a business as usual scenario, also called official future or surprise free scenario. Their purpose is to know what would happen if nothing new happens.

Results of interest are delivered by the so called contrast scenarios, which can be exploratory or anticipatory. In the first case there is to distinguish between prospective scenarios, which project forward trends experienced over some past period. Perspective scenarios anticipate upcoming change that significantly varies from the past.
Anticipatory scenarios differ in the question whether a desirable or an avoidable future is defined.

Scenario development is an iterative process with several progressive phases: scenario definition, scenario construction, scenario analysis. There are many different, though often similar procedures or scenario techniques known from literature. The scenario **definition phase** selects the issue and identifies the specific characteristics of scenarios that are of interest, such as the spatial and temporal scales of the scenario. It identifies the key factors that drive the system looked at and makes assumptions, whether the future is considered to be a trend of the present or has the potential for a paradigm shift in system behaviour. This is a prerequisite to choose the appropriate type of scenario, as shown before.

After the scenario definition **scenario construction** (or writing) starts with formulating a first draft storyline. As told before, it is important to check, whether scenarios and all basic assumptions are consistent.

The last step is the **scenario analysis**, this is the analysis of the scenario outcomes, the evaluation of the possible impacts and at last the development of new strategies for the future.