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A Scenario-based Approach to Strategic Planning –

Tool Description – Scenario Matrix

HHL – Leipzig Graduate School of Management

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INTRODUCTION

In this paper we describe the fourth-stage of our six-step scenario-based approach to strategic planning, the scenario building. Having completed the trend and uncertainty analysis using the *'Impact/Uncertainty Grid'* tool in stage three, we will present in this paper how plausible scenarios can be created based on the identified key uncertainties using the *'Scenario Matrix'* tool (Figure 1). The overall goal of the scenario building step and its *'Scenario Matrix'* tool is to generate and develop four distinct future scenarios. Of particular interest in this context is the actual process of deriving the scenarios out of the previously identified two critical influence factors using the so-called 'scenario influence diagram' and 'scenario fact sheet' (Wulf, Meissner and Stubner, 2010). Before explaining the *'Scenario Matrix'* tool itself we will examine what scenarios actually are, what the basic idea behind them is and how they can help a company to think ahead.
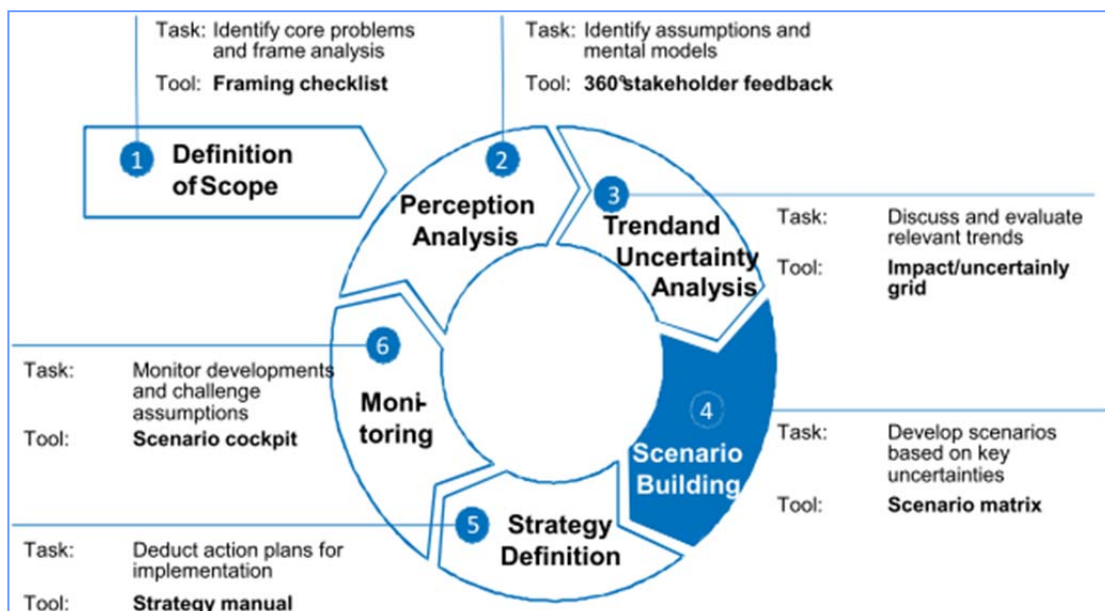

Figure 1: Six-Step Scenario-based Approach to Strategic Planning

BACKGROUND INFORMATION SCENARIO BUILDING

Building sound and plausible scenarios is a challenging task that needs to follow a structured process. However, before describing the scenario building itself, one should first identify the purpose that the creation of scenarios fulfills. Academics usually distinguish between three purposes which scenarios can accomplish:

- First, scenarios are used as a onetime activity to predict and evaluate a specific, already defined strategic plan of action.

- Second, scenarios are used as a onetime activity to support and enhance a specific strategic planning process including related decisions.

- Third, scenarios are used from a onetime activity to an ongoing course of action within an organization's strategic planning process supporting the way in which an organization learns (Bradfield, Wright, Burt, Cairns and van der Heijden, 2005).

What all three purposes have in common, however, is that scenarios enable managers to be better prepared for strategic decisions, especially in times of increased volatility and environmental uncertainty.

The scenario building approach presented in this paper can be used for all three purposes explained above. Nevertheless, it is mostly applicable to the third purpose as its holistic approach aims at utilizing scenario planning for a company's continuous strategic planning activities. Establishing a common understanding, we see scenarios as a plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key relationships and driving forces (Metz, Davidson, Bosch, Dave and

Meyer, 2007). Scenarios in the context of our approach are not meant as a forecast or precise prediction nor do they state a desired future (Lindgren and Bandhold, 2009). Rather they produce a picture or a story describing a possible future which, as explained in the previous paragraph, supports organizational learning and readiness for unforeseen events. In the sense of this paper, scenarios provide different views on the nature of the future (van der Heijden, Bradfield, Burt, Cairns and Wright, 2002). Put differently, scenarios try to answer so-called 'What if…?' questions, evidently bringing risks as well as opportunities to an organization's attention, rather than concealing them (Lindgren and Bandhold, 2009). In our six-step scenario-based approach to strategic planning, scenarios go even one step further by answering 'What if, then…!' questions and hence giving strategic recommendations for a specific course of action to be undertaken by organizations in the four scenarios (Liebl, 2002). This aspect however, will not be examined in this paper, but in the subsequent one focusing on the *'Strategy Manual'* tool.

As explained in the previous steps (see *'360° Stakeholder Feedback'* tool and *'Impact/Uncertainty Grid'* tool), scenarios examine critical uncertainties and variations of uncertainties in addition to important predetermined trends (van der Heijden, Bradfield, Burt, Cairns and Wright, 2002). Different tools have been developed in the past trying to fulfill the task of developing scenarios based on uncertainties as well as trends. Again, three different approaches to scenario building can be distinguished. The first approach uses extrapolative data analysis and trend models giving each scenario a specific probability of occurrence and is subsequently forecasting oriented. This quantitative approach is expert-led, that is the planner controls the process, completes the narrow-focused scenario building task using

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proprietary tools, expert judgment and historical time series data. The outcome usually is a brief document explaining the produced quantitative data with a short storyline for three to six scenarios (Bradfield, Wright, Burt, Cairns and van Der Heijden, 2005).

The second approach uses both quantitative and qualitative analysis focusing on intuitively run workshops as well as complex computer-based mathematical models to develop multiple future scenarios. It is expert-led with some participation from senior managers within an organization. The outcome is an extensive set of data-driven scenarios supported by an extensive storyline as well as possible actions and their consequences (Bradfield, Wright, Burt, Cairns and van Der Heijden, 2005).

The third approach is qualitatively and organizationally focused. The scenarios are constructed within an organization using inductive or deductive processes monitored by an experienced scenario practitioner. The outcome is a logically, qualitatively and discursively described set of two to four scenarios all being equally probable (Bradfield, Wright, Burt, Cairns and van Der Heijden, 2005).

Examining the descriptions of the three approaches in more detail one can see that each one has a different agenda and goal that it tries to achieve. The first approach follows the classic idea of strategic planning, that is, it tries to find "the one best" strategy by giving various scenarios different probabilities (Ansoff, 1965). Based on these probabilities managers feel more certain about the future, develop specific strategic actions for the most probable scenario and execute them. The focus hence lies on obtaining better forecasts by perfecting

extrapolative data analysis or trend models (Wack, 1985a). This approach might work well in a stable economic environment, but is very difficult to apply under volatile or uncertain conditions. Additionally, the quantified scenarios are developed by experts who have hardly any interaction with the outside world or the decision makers responsible for acting upon the developed scenarios (Wack, 1985b). Of course, as for the other approaches the outcome of this method is a document explaining the scenarios. However, the decision makers were not part in developing the document meaning they seldom feel inspired, motivated or energized by the scenarios usually describing a situation beyond their focal point of attention.

The agenda and goal of the second approach is slightly different and to a certain extent tries to overcome the limitations of the forecasting oriented approach. By not only focusing on computer-based models that try to attach a probability of occurrence to each scenario, this approach involves workshops with senior managers discussing the results and scenarios obtained from computer models. Senior managers might thus obtain strategic insights that go beyond being presented with a specific figure on which they can develop a strategy. However, they will still find it tremendously challenging to understand the uncertainty factors and forces driving their value chain and subsequently the developed scenarios. Put briefly, involving someone else's model where only the results are discussed substitutes thorough and concise thinking by senior managers, which is crucial when it comes to developing as well as executing strategies (Wack, 1985b).

The third approach takes its agenda one step further by using company-internal inductive or deductive processes to develop scenarios. At this stage all relevant stakeholders are engaged in the scenario-development process. This also means that the probability of the scenarios representing actual significance to a manager is higher. Nevertheless, scenarios do not only represent information about a specific state of the world. Rather, they are also about perceptions (Wack, 1985b). Thus, if one keeps the scenario building process only within the cosmos of the organization, there is the danger of sticking to established mindsets and ignoring previously identified uncertain factors that might have a high impact on the future development of the business. Rather, the inclusion of internal and external stakeholders seems necessary in order to incorporate the philosophy of expanding one's mind and of discussing what could happen into the scenario development process (van der Heijden, 2005).

This last approach is best suited to our understanding of scenario planning since it enables all key stakeholders to advance organizational learning and readiness for unforeseen events within a company. The other two approaches are either too complex or too expert-focused to be fully integrated into an organization's strategic planning process.

Having briefly explained the various scenario building approaches one can see that each one has certain shortcomings beyond the ones discussed. In summary, they are very resource intensive, lack a method for identifying extreme or unforeseen events and are often difficult to be introduced into an organization's existing strategic planning activities (Lindgren and Bandhold, 2009). We believe that the *'Scenario Matrix'* tool described in the next section

overcomes these shortcomings by giving extensive methodological support for developing and visualizing scenarios. The tool known as the matrix approach was first described by Kees van der Heijden (2005) and best fits our definition of how we perceive scenario planning.

DESCRIPTION OF THE 'SCENARIO MATRIX' TOOL

The *'Scenario Matrix'* tool described in this paper follows an approach which was first introduced by van der Heijden (2005). The scenario matrix is a deductive method useful for constructing and describing scenarios in uncertain and volatile situations. Deductive scenario methods are perceived as the most analytical and exhaustive ways of building scenarios from an outside-in perspective (van der Heijden , 2005).

The scenario matrix builds and visualizes four scenarios based on two key uncertainty factors. Four is regarded as the maximum number of scenarios that decision makers are still able to manage (Wack, 1985b; van der Heijden, 2005). The scenario matrix is complemented by two other tools that are important for scenario building - the fact sheet and the influence diagram. Overall, four sub-steps are necessary in order to design and describe scenarios on the basis of the scenario matrix tool.

Sub-step 1: Scenario identification

At the heart of scenario identification is the scenario matrix. The scenario matrix is based upon the two key uncertainty factors that have been identified in step three, the trend and uncertainty analysis, of our six-step process to scenario-based strategic planning using the *'Impact/Uncertainty Grid'* tool. In order to construct the scenarios, it is necessary to project each key future uncertainty with an extremely positive and negative outlook along the x and y axes of the matrix. Subsequently, one can position the scenarios in the four quadrants of

the developed matrix, thus automatically generating four distinct scenarios (Figure 2). The two key uncertainty dimensions are hence the basis for building as well as describing the four scenarios. We commonly develop scenarios that look three to five years into the future. This matches the typical time frame for strategic planning activities. Each scenario should be given a concise and easily memorable name. When brainstorming for relevant names one can for example consult historical events associated with the scenarios such as Greek mythology. The scenario name should enable the reader to quickly capture the story of the scenario and to understand the alternative worlds which the scenarios describe. It is important to focus the name on the chain of causes and effects behind the scenario description, the so-called influence diagram, rather than its end-state (van der Heijden, 2005).
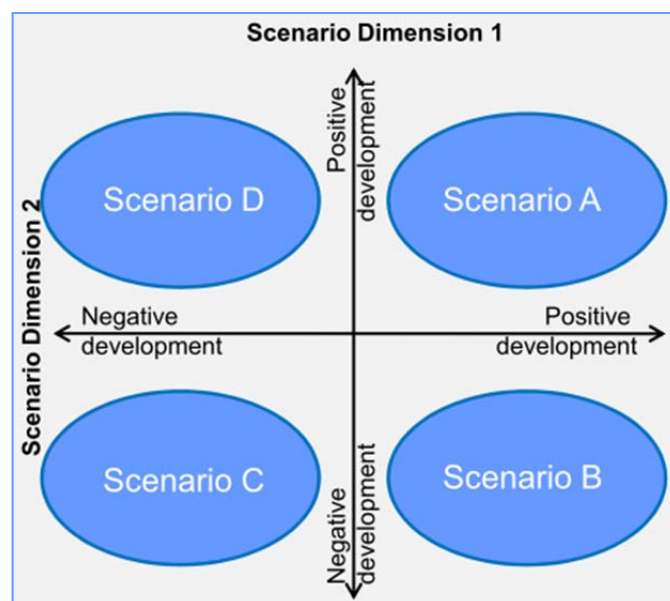

Figure 2: Scenario Matrix

Sub-step 2: Creation of an influence diagram

In the second sub-step the stories behind the scenarios need to be built. These stories describe the paths along which the world will arrive at the four alternative scenarios (van der Heijden, 2005) In order to derive these stories, we generally build a chain of causes and effects leading to these end-states. This chain of causes and effects is called the 'influence diagram' and describes the strategic levers behind the scenarios (van der Heijden, 2005).

In order to develop the influence diagram it is necessary to establish a list of factors, forces, trends and their interrelation. Here, the trends and uncertainties identified in step three of our six-step process are a good starting point. It is important to select the most important factors, to link them together, to look for interdependencies and to analyze how one development impacts on another from the moment the scenarios are written up to five years into the future.

When visualizing different future developments using an influence diagram it is important to ensure the authenticity and consistency amongst the various developments. Linking a trend with a critical uncertainty needs to be done unambiguously using arrows displaying the influence one development has on another. For example, describing a future scenario where an increase in taxes for venture capital firms leads to high investments in biotech start-ups is not plausible and consequently discredits the whole scenario building process. This can be avoided by clearly distinguishing developments from specific events and testing whether the developments are capable of going up or down, e.g. putting an 'increase in' in front of taxes (Figure 3);(van der Heijden, 2005). It is thus the role of the scenario project leader to

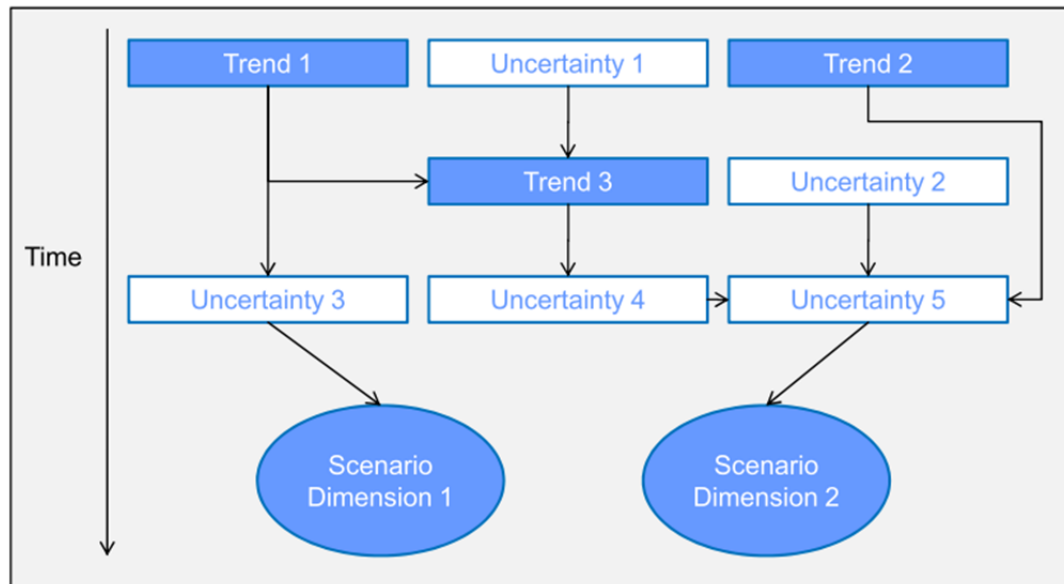perform a sanity check testing each linkage amongst trends and uncertainty factors for inconsistencies.

Figure 3: Influence Diagram

At this stage it should be noted that we advise the development of the scenario axis and influence diagram to be conducted in a workshop setting. Contributors to the workshop should be the participants identified in step one of the process using the *'framing checklist'* tool. Usually, these contributors consist of senior executives, industry experts and specialists involved in a company's strategic planning activities. The workshop should be facilitated by a moderator guiding participants through the steps described above. The key advantage of developing the scenarios in a workshop setting stems from the fact that all key participants are actively involved in the process of ensuring consistent and plausible scenarios.

Sub-step 3: Scenario description

Once the influence diagram has been completed and all interdependencies have been checked, one can start describing the four scenarios in continuous prose. Here, the previously explained influence diagram should be used as a basis for describing the dynamic nature of each development. By systematically describing why a certain development happens and how this influences another development one creates the basis for writing the story (van der Heijden, 2005). At this stage there are two writing techniques: First, one can write small text modules for each trend and uncertainty on the influence diagram. Depending on the type of scenario, these text modules have different forms, e.g. positive development of GDP for scenario A versus stagnating GDP growth for scenario B. Upon completion of writing the text modules one needs to place them in a logical order as done in the influence diagram. Subsequently, the different text modules need to be connected. When writing the scenarios in this manner one usually starts with the global or macro perspective breaking it down to an industry or company level depending on the scope of the scenario project.

Second, one can apply a more creative technique by not focusing on each trend and uncertainty on the influence diagram individually, but looking at the whole picture and taking the influence diagram as an orientation. Here one should start with the final outcome of the scenario and explain, using the various trends and critical uncertainties, what has to happen in order to arrive at the final state. Given that this technique focuses on a free writing

style there exists the danger of giving strategic recommendations rather than describing the environment of the scenarios.

At this stage looking back at the *'Impact/Uncertainty Grid'* one can see that our method for describing the scenarios is not a random task of putting together unsystematic future developments, but a precise and well structured process based on a thorough and validated set of developments for the future. Next, one can complete the literary description of the scenarios by giving each scenario a concise headline and sub-header as it is done in newspaper articles. This step helps to capture the scenario reader's attention, makes it easier to communicate the essence of each scenario and above all stimulate creative thinking about future developments.

Sub-step 4: Creation of a fact sheet

The last step of the *'Scenario Matrix'* tool is to establish a brief fact sheet for each scenario. A fact sheet should contain the relevant numbers, key indicators and a short description of each scenario. When looking at a fact sheet, the reader should quickly understand the current situation given the scope of the scenario, the relevant measures on which it is based and what the scenario actually looks like (Figure 6).

Having completed the description of the scenarios and the fact sheet one should perform a final check examining whether the scenarios fulfill the purpose they have been developed for: Do the developed scenarios help to understand and anticipate uncertainties as well as

risks? Have the scenarios revealed strategic opportunities one was previously unaware of (Wack, 1985b)? If the answer to both questions is yes, then the scenarios should lead managers to perform certain actions based on the scenarios. If the answer to the questions is no, than the scenarios are simple guesswork and should hence be revised.

Application to the European Airline Industry

We recently applied the *'Scenario Matrix'* tool to the European Airline Industry in a scenario study written from the perspective of European Network carriers. The two key uncertainties identified are *'degree of regulation of the industry in Europe'* and *'price sensitivity of the customer base'*. Afterwards, we conducted a workshop with industry experts to develop four industry scenarios. In this workshop each uncertainty was placed on one axis of the matrix respectively and given a more positive and a more negative connotation – positive and negative from the perspective of the companies for which the scenario analysis was done, in this case European network carriers like Lufthansa, Air France-KLM or British Airways. In terms of the *'degree of regulation of the industry in Europe'*, the positive development is a *'protectionist regulation of the industry in Europe'* and the negative development an *'open regulation of the industry in Europe'*. In terms of the *'price sensitivity of the customer base'*, the positive development is a *'decreasing price sensitivity of the customer base'* and the negative development an *'increasing price sensitivity of the customer base'*. Afterwards, each scenario was given a concise and easily memorable name (Figure 4).

Each name symbolizes the various developments within the scenario, e.g. 'Europe under Siege' represents European Network Carriers having to deal with a very open regulation of their industry while at the same time experiencing a decreasing price sensitivity of its customer base. Hence, due to the open regulation their home market is under attack by airlines from outside Europe while the whole market is benefiting from a consumer's willingness to pay more for flights.

Figure 4: Future Scenarios for the European Airline Industry

In the next step, an influence diagram displaying the developments necessarry to take place until 2015 for the key uncertainties to develop was established. Developments included in the influence diagram are e.g. the *'level of innovation of European Airlines'* or the *'service/comfort/price expectation of clients'* (Figure 5). As one can see, the authenticity and consistency amongst the various developments is ensured. Based on these consistent developments, the scenarios were extensively described in continuous prose.
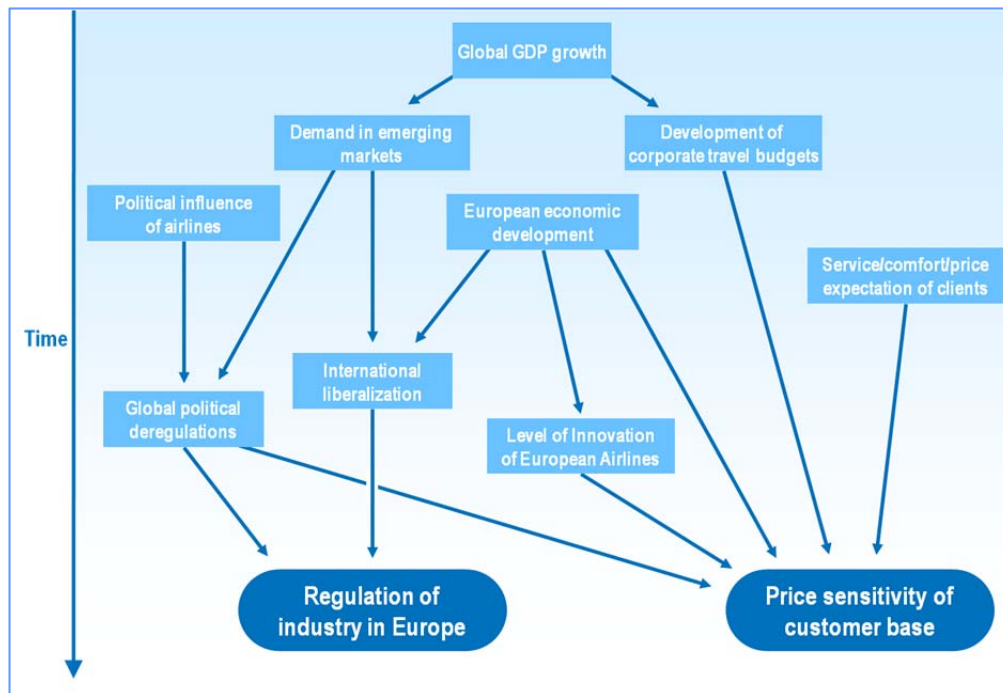
Figure 5: Influence Diagram for the European Airline Industry until 2015

In a final step we produced a fact sheet for each of the scenarios (Figure 6). The fact sheet for the 'Network Fortress' scenario contains relevant numbers, key indicators and a short description of the scenario. The final outcome of having applied the 'Scenario Matrix' tool to the European Airline industry is a precise set of four different industry scenarios until 2015 as well as an influence diagram and fact sheet for each scenario. Performing the check if the developed scenarios fulfill their purpose provides a positive result. Feedback received from industry experts having read the scenarios indicates that the scenarios anticipate uncertainties and risks and show managers strategic opportunities that they were previously unaware of.
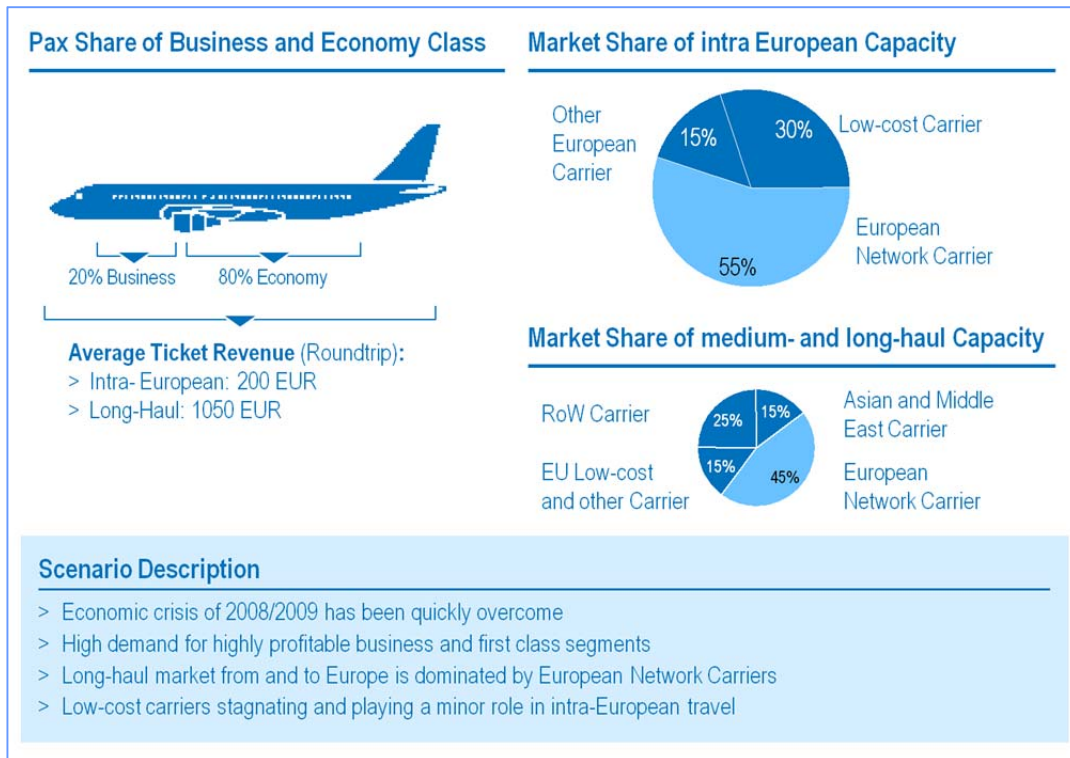
Figure 6: Fact Sheet 'Network Fortress' Scenario for the European Airline Industry

EVALUATION

The *'Scenario Matrix'* tool is a well-structured, efficient and clear-cut method for developing four scenarios supported by an influence diagram and a fact sheet. Its main advantages lie in the logical and quick way in which the scenarios are developed. Thoroughly applying the tool in an extensive form as it was done in the scenario study on the European Airline industry takes about five to six man-days plus the resources required for the half to one day long scenario workshop. Hence the manpower and resources required to apply the tool and develop extensive scenarios are marginal compared to other scenario development techniques.

Nevertheless, applying the tool to the European Airline industry produced some controllable shortcomings. First, developing four scenarios based on two key uncertainty factors supported by an extensive list of future developments stemming from the influence diagram does not guarantee full completeness of the scenarios. Second, despite establishing an influence diagram checking the authenticity of each influence factor, there remains a certain danger that logical pitfalls do appear within the scenarios. Even so, when applying the 'Scenario Matrix' tool as part of the whole six-step process to scenario-based strategic planning according to the specifications given in each tool description, the risk of the two shortcomings appearing is only limited.

Concluding, the outcome of the *'Scenario Matrix'* tool is a plausible set of four scenarios indicating how an industry can develop in the future. These four scenarios enrich the strategic planning process by leading to creative thinking and an active engagement with the future and thus respond to a manager's deepest worries. To further benefit from the various scenarios one has to derive strategic implications for an industry or company for each scenario. This process will be explained in our tool description focusing on the *'strategy manual'*.

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