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Abstract

As mobile telecommunication industry experiences dramatic structural shifts caused by complex combination of technological, economical, competitive and social factors, companies are making significant strategic changes affecting future of their business. This thesis was done for Nokia Design, Research and Foresight team in order to research how future scenario planning can improve strategic management in uncertain business environments and to study applicability of the findings in practice.

More precisely the goals of the thesis were (1) to perform a theoretical study on methodology, benefits and limitations of the scenario planning in the strategic management in rapidly changing and unpredictable business environments; and (2) to apply the findings in practice during planning of and executing the scenario project at Nokia and analyze how to use successfully scenario planning in practice of the strategic management. The work relied on both secondary research of the scenarios methodology and primary research during case study of scenario planning project.

It was found that scenario planning could be successfully used for understanding the structural uncertainties and unpredictable events in rapidly changing business environments, when applied for strategic vision and strategic option planning, and demonstrated its limitations in comparison with another future planning method - forecasting.

The main impact of the scenarios was in expanding mental models of decision makers and it was found in practice that understanding stakeholders' mindsets by involving them in the process was extremely critical for the success of the scenario planning project. Experimenting with modifications of the scenario planning methodology during case study also discovered benefits in development of the scenarios in iterative approach when scenario creation workshops were followed by desk research or field research work.

Finally, the thesis unveiled potential future research questions for (1) application of scenario planning methods in multiple geographically distributed teams, and for (2) effectiveness of foresight for finding the right answer to strategy vs. fast learning from visionary trial-and-error practical strategy application in unpredictable business environment.

Key words: *foresight, scenario planning, strategic management, forecasting*



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“My interest is in the future because I am going to spend the rest of my life there”

- Charles Franklin Kettering, founder, A.C. Delco, and Vice President, General Motors Research (1876-1958).

1. Introduction to Future Scenarios in Strategic Management

1.1 Scenarios in Strategic Management

Strategic management starts its history from 1950s and 1960s, when it was adopted as the primary way to create and implement strategies, and since then it was profoundly developed (Mintzberg, 1994a). Nickols (2000) provided a concise overview of various definitions of strategy, but for the purpose of this thesis the following definition was used:

“Strategic or institutional management is the conduct of drafting, implementing and evaluating cross-functional decisions that will enable an organization to achieve its long-term objectives” (David, 1989).

Strategic management make use of various approaches and has many schools of thought, but most of them revolve around understanding the external business environment and making the organizational decisions with the impact on the long-term goals.

Term **future scenario** has various meanings in business and strategy literature. In the scope of this thesis the following definition was used:

“Future scenario is a rich, data-driven story about future that drives better decisions today. Scenarios offer a way to organize and test assumption about the future despite inherent complexity and uncertainty. Scenarios provide a framework for recognizing and adapting to change over time – ahead of time” (Global Business Network, 2008, p.11).

Wilkinson (1995) explains that scenario planning takes the assumption that it is impossible to know how the future plays out. The good strategy is the one that is robust across different future scenarios. Therefore, scenarios are always created in sets and they are distinctive from each other, presenting a plausible model of the future environment.



For example, Hammond (1998) presented future scenarios for seven major world regions for the next fifty years. The scenarios were based on long-term analysis of demographic, economic, social, environmental, and security trends and were summarized as follows:

- Market World – a future based on market forces and new technology bringing prosperity and a brighter future;
- Fortress World – a future in which disproportional economic growth created prosperity in few countries, surrounded by countries drowned in poverty and despair. This future contained stories of environmental and social deterioration, violence and conflicts;
- Transformed World – a future of fundamental social and political changes that give a hope for future of mankind (Hammond, 1998).

The core of the thesis is to study use of the **scenarios in strategic management** both in theory and practice, illustrating how scenario planning takes into account future uncertainty, complexity of the environment, and provides the way to organize the knowledge and assumptions about the future. Moreover, it is highlighted that scenario planning methodology includes a system of indicators and signposts that organization can regularly monitor in order to determine which future scenario starts to happen.

1.2 Research Questions and Goals

In order to understand the effect of the future scenario planning on the strategic management the following **research questions** were formulated for the thesis:

- 1) How the future scenario planning can be applied to the strategic management in rapidly changing and unpredictable business environments?
- 2) What are the limitations of the tool and the alternative approaches?
- 3) What are the best practices in applying this tool?

In practice the following **approach** was taken in order to answer the research questions:

- literature review of methodology for scenario planning and applicability for various strategic purposes;



- own critical analysis of the scenario planning in comparison with other future planning methods;
- summary of practical steps for using the selected approach based on the literature review and on learnings from practical application of the tool in the case study project.

1.3 Scope

This thesis was done at Nokia Design, Research and Foresight team and the **choice of the topic** was influenced by two factors:

- Mobile telecommunication industry experiences dramatic changes in the competitive and business environment. These changes are caused by structural changes as a result of a complex combination of various technological, economical, competitive and social factors and forces. Therefore, strategy formulating processes based on assumption of predictable and incremental changes in the industry are in need of revision.
- Response to such dramatic changes includes some degree of strategic diversification, i.e. moving to the new sectors of industry and new markets simultaneously. It increases the uncertainty due to complexity of change and due to events that cannot be foreseen prior to diversification. Therefore, there is a strong need to implement a system for fast reaction to unpredictable challenges caused by such strategy change.

The practical interest from Nokia Design, Research and Foresight team was to study how scenarios can improve creating strategy in industries with dramatic structural changes and to study applicability of these findings in practice to a newly created service line operating in new markets.

The intention of the thesis was to pay due attention to the **literature related to the future studies** and to future scenarios in particular. Various sources describing the intention, the process of creating future scenarios and methods of using them in the strategic management were used for theoretical background of the thesis. However, this thesis did not have an objective to describe the whole process of the strategic management thoroughly and therefore it provides only a high level overview of literature on the strategic management.

The target of the thesis is the **uncertainty in business environment** and its effect on strategy. The analysis was considering various aspects of the



future studies, the scenario planning process and the strategic management through the lenses of the uncertainty in the business environment.

The substantial part of the thesis was dedicated to the **case study** of the future scenario planning project performed at Nokia Design in 2008. As a part of the thesis work this project was prepared, planned and executed by the thesis author at Nokia Design, Research and Foresight team.

The main interest of the thesis is the methodology of the scenario planning and its applicability to the strategic management practices. The case study provides only an overview of the methods and process of future scenario building, which do not constitute confidential information. The confidential practical results and outcomes of the project (i.e. scenarios themselves) did not contribute to the description of methodology and are not disclosed in the thesis.

1.4 Research Methods

This thesis development was not a pure research project, but rather influenced by the practical objectives of creating future scenarios described in the case study in section '4.2 Case study: Future Scenarios for Emerging Markets'. Thesis work prioritized project objectives to rigorous application of any research methodology. However, the following research methods influenced the structure of research work for the thesis.

Firstly, the **hermeneutics circle** influenced general structuring thesis writing process. The hermeneutics circle is characterized by iterative approach and reflections for understanding the research area, which leads to formulating more detailed research question about the topic. Iteration cycles that were used in the thesis development: topic and goals formulation, theoretical background study, developing plan for the practical part, collection of information, analysis of information and practical recommendations elaboration. Each cycle consisted of planning, execution and reflection phases.

Secondly, **case study** research practices were used in the practical part. Case study is characterized by selecting a study area expediently (not based on any random sampling), by active interaction of the researcher with the research subject and by having a main target to reveal unexpected issues.

Also thesis work relied both on primary research during case study and secondary research during literature review and theoretical background study. All aforementioned research methods were not followed rigorously



and only certain parts of the research methodology were used where it was applicable.

1.5 Thesis Structure Overview

Chapter '1 Introduction to Future Scenarios in Strategic Management' explains the background and research goals of the thesis, outlines what is in the scope of the thesis and what is not, and introduces methodological approach to the thesis research.

Chapter '2 Solving Uncertainty in Strategic Management' provides necessary background of the strategic management. It is based on the overview of strategic management and future scenario sources, and discusses primary target of the scenario planning - the uncertainty in strategy. Summarizing scenario planning benefits and comparison with other approaches to future planning – forecasting, provides justification for the choice of the scenario planning as the selected method for future planning in this thesis.

Chapter '3 Future Scenario Planning Methodology' is based on the review of the specific scenario planning literature. The goal of the chapter is to explain history, main concepts, terminology and available methodology in scenario planning. The chapter presents the discussion of the available methods and explains why certain methods were applied during the case study project.

Chapter '4 Future Scenario Practice' presents the practicalities of scenario creation process. Five concrete steps for creating a future scenario set recommended by scenario planning practitioners are explained. Also the case study describes how these steps were applied in practical work, including required methodology modifications.

Chapter '5 Analysis and Discussion' starts with analysis and discussion of case study findings. It includes examining practical applicability of theoretical recommendations and analysis of required methodological modifications and challenges discovered during the case study work. The chapter concludes with a thorough analysis of the research question based on theoretical and practical parts of the thesis.

Finally, chapter '6 Conclusions' summarizes the most critical learning from the theoretical study, the most important findings from the case study, outlines limitations of the future scenario planning and suggests next research areas.



2. Solving Uncertainty in Strategic Management

2.1 Overview of Strategic Management

The concept of the **business strategy** was borrowed from the military, where it often referred to maneuvering troops into position before the enemy was actually engaged (Nickols, 2000).

Section ‘1.1 Scenarios in Strategic Management’ presented the definition of the strategic management that was used in this thesis. For any company defining strategy means selecting the sectors of the activities and allocating resources to maintain or develop presence in these sectors (Collard, 2006). In practice one approach to accomplish this task is to follow the process of specifying mission, vision and objectives, developing policies and plans and then allocating resources to implement these plans as shown in Figure 1.

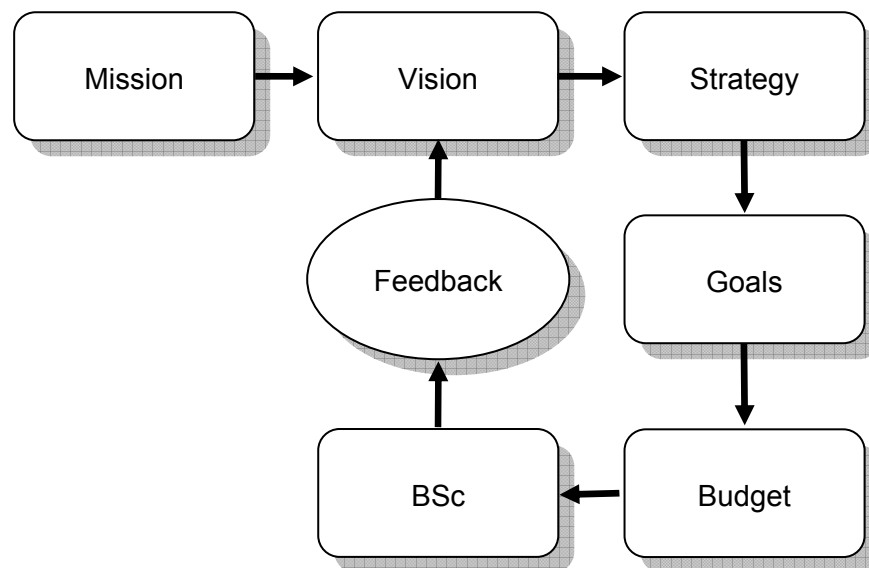


Figure 1. Strategic planning (af Ursin, 2004).

According to Collard (2006) one of the fundamental elements of strategy formulation is the competitive analysis – “*analysis of the internal characteristics, identification of the key forces which are impactful on the segment and the means of the competition*”. Strategists use various methods of portfolio analysis, like Boston Consulting Group (BCG) Matrix, Arthur D. Little (ADL) Matrix, McKinsey Matrix, Ansoff Matrix, SWOT analysis, LCAG model, and five forces of Michael Porter shown on Figure 2. These methods help to rationalize the strategy decisions and to compare



heterogeneous activities through a homogeneous framework (Collard, 2006).

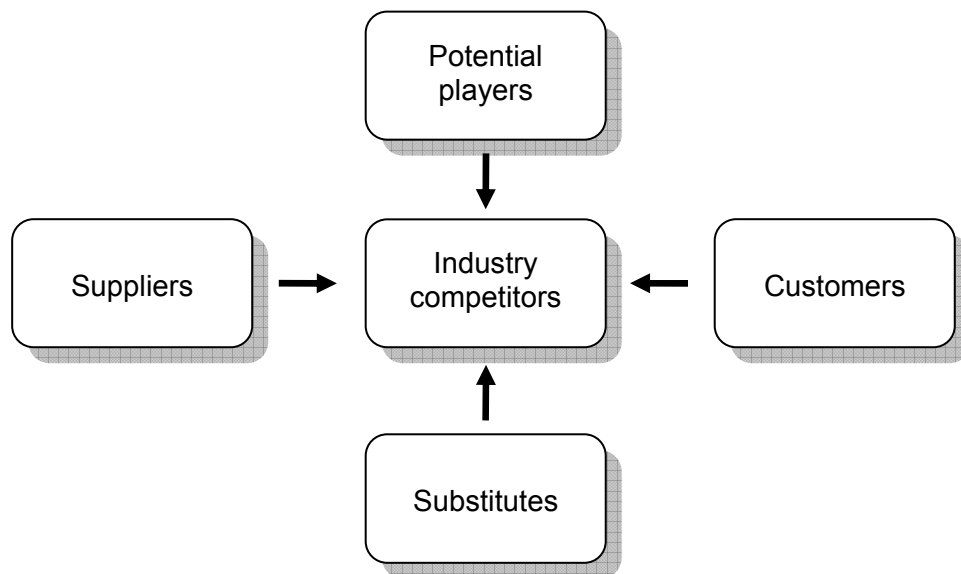


Figure 2. Five forces of Michael Porter (Collard, 2006).

Obviously, each of the tools has its advantages and limitations. For example, BCG matrix is suited for mature businesses, with low technological innovation (e.g. consumer goods) as it focuses on cost activities, and ADL matrix is affected by the subjectivity (Collard, 2006).

The full comparison of the methods was out of the scope of this thesis, but the following critique of the aforementioned portfolio analysis methods was found relevant to the thesis research in the context of future scenarios. For example special cases affected by cyclical factors (e.g. a recession) or structural factors (e.g. businesses with no competition, dead-end segment, etc) cannot be fully analyzed with the aforementioned tools (Collard, 2006). Moreover, Pine (1999) describes experience economy as the next step after agrarian economy, industrial economy and service economy. In experience economy the company's main "product" is memorable events and experiences and therefore many of the aforementioned analysis tools do not apply. Throughout the thesis and in particular in section '2.2 Benefits of Scenario Planning for Strategy' it is demonstrated how some of these concerns are addressed by scenario process.

The center of attention of this chapter is the **uncertainty** of future and how strategy process deals with it. Therefore, the strategic management is studied through the lenses of the unpredictability of the future. Planning for



the future is the integral part of the strategic management as Van der Heijden (2005, p.15) states that *“the idea of strategizing for the future is fundamentally based on the unpredictability of the future, of which some aspect, we assume can be foreseen”*.

Since 1950s strategic management developed numerous schools of thoughts and paradigms. In the next section the uncertainty is reviewed on the example of the rationalist paradigm of strategy - the most old and traditional approach.

2.1.1 Rationalist Paradigm

Rationalist paradigm of the strategic management was in use since 1950s and 60s. It is based on the principle of following linear model with three main phases: apprise – determine – act (Bar, 2005). According to Van der Heijden (2005, p.23) the *“central idea of this approach is that there is one right (best) answer to the strategy and strategic task is to find it”*.

Typical steps in such strategy process are described in section ‘2.1 Overview of Strategic Management’ and include defining the mission, SWOT analysis, selecting optimal strategy, implementation, appraisal and control.

When it comes to the future uncertainty, rationalistic strategizing for the future primarily uses the **forecasting**. The forecasting implies a variety of methods like regression analysis, extrapolation, simulation, and prediction markets, with essential commonality - possibility to extend past into the future (Van der Heijden, 2005, p.25).

According to Van der Heijden (2005, p.23) the rationalist approach and the forecasting work well when *“questions for the future are well defined and environment is characterized by the stable interfaces between actors”*, in other words, during the times when the business environment is relatively predictable and calm.

However, Mintzberg (1978) showed that cycles when industry characterized by relatively stable environment are changed with highly disruptive and **unpredictable environment** as shown in Figure 3. Therefore, all organizations from time to time appear to be facing major life-or-death situations. There are different causes for such phenomena, e.g. a change in the business environment or a disruptive innovation, but according to Van der Heijden (2005, p.27) it often causes collapse of the companies.

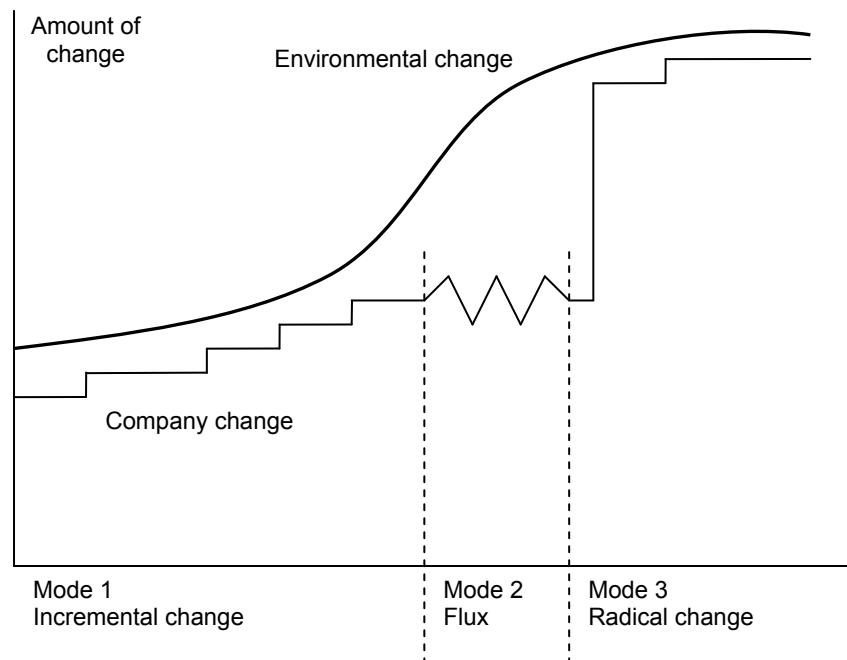


Figure 3. Period of turbulence (Van der Heijden, 2005, p.28).

Moreover, such authors as Wack (1985a) and Christensen (1997) studied the paradox of failure of successful and well-run companies during unpredictable and disruptive changes. The organizations decline because they “*develop too sharp an edge, having too narrow focus of attention, i.e. becoming too focused on doing few things well*” (Miller, 1993) and also have more consensus on the strategy and less aware of alternative approaches to the strategic management (Van der Heijden, 2005, p.16).

Thus the rationalist paradigm and the **forecasting approach fail** during such times. Van der Heijden (2005) states that two fundamental reasons for such failure are:

- Assumption of the stable structure in all forecasting methods from simple statistical approaches to complex simulation models. The forecast cannot predict the future if there are some fundamental structural shifts in the environment or the industry.
- Crisis of perception in organizations, which can be simply described as reluctance to change before crisis. It is explained by organizational difficulties to challenge decisions that are bringing the current success.



These and other shortcomings described by Mintzberg (1994b) are addressed by the scenario methods which deal both with the structural change and the crisis of perception as shown in section '2.2 Benefits of Scenario Planning for Strategy'.

2.1.2 Uncertainty and Strategy

Section '2.1.1 Rationalist Paradigm' demonstrated challenges of the rationalist paradigm and the forecasting during turbulent times due to the uncertainty. This section studies the sources of the **uncertainty** in the business environment.

Obviously the complexity of the rapidly changing business environment is causing the uncertainty about developments in the future. Models for strategic analysis like Porter's five competitive forces described in section '2.1 Overview of Strategic Management' provide simplification of the existing environment only to certain extent.

Uncertainty may create different reactions in organizations. Denial and paralysis are the two most common managerial reactions according to Global Business Network (2008) and Star and Randall (2007):

- **Denial** is most often caused by inability to see and accept the forthcoming change. In practice Star and Randall (2007) provide two examples of denial: an organization becoming attached to a current business model not appropriate for new products or an organization following a set of policies that prevent many interesting potential projects.
- **Paralysis**, on contrary, is typical for organizations willing to explore new alternatives, but unable to solve a large range of possibilities. Star and Randall (2007) argue that after a disruption in technology or new market opportunities, managers are often looking for information that suggest or confirm a final choice from the complex variety of strategic options. Usually such delay becomes a cause of the lost opportunity as this information rarely becomes available on time.

According to Van der Heijden (2005, pp.93-94) there are three major **categories of uncertainty** and corresponding responses in the strategy, that are compiled in Table 1.



Table 1. Categories of uncertainty and strategic responses.

Category of uncertainty	Strategic response
Risks , with sufficient historical precedent, i.e. similar events in the past. Risks can be estimated with probabilities for various outcomes	Forecasts can be applied as they are based on historical performance
Structural uncertainties are result of a rather unique event making impossible to assess the likelihood. However, it is possible to apply certain cause and effect reasoning for structural uncertainties.	Scenario based planning deals with structural uncertainty using multiple examples of the future. Scenarios do not eliminate uncertainty and do not provide probability. They assist in making a judgment of the degree of robustness of the strategic decisions considering the range of uncertainty.
“Unknowables” , meaning unimaginable events. There are a lot of examples of “unknowables” in the past and thus it is reasonable assume that they continue happening in the future.	Skillful reacting is the only response as any pre-study is not possible.

Van der Heijden (2005, pp.93-94) makes a note that even though the problem of uncertainty cannot be solved for “unknowables” the benefit of the scenario process is developing perceptual skills of the organization and thus improving reacting skills.

It is natural to assume that level of uncertainty increases and level of the predictability decreases as one looks further in the future. Figure 4 demonstrates how the scenario planning and the forecasting methods can be applied for different time horizons.

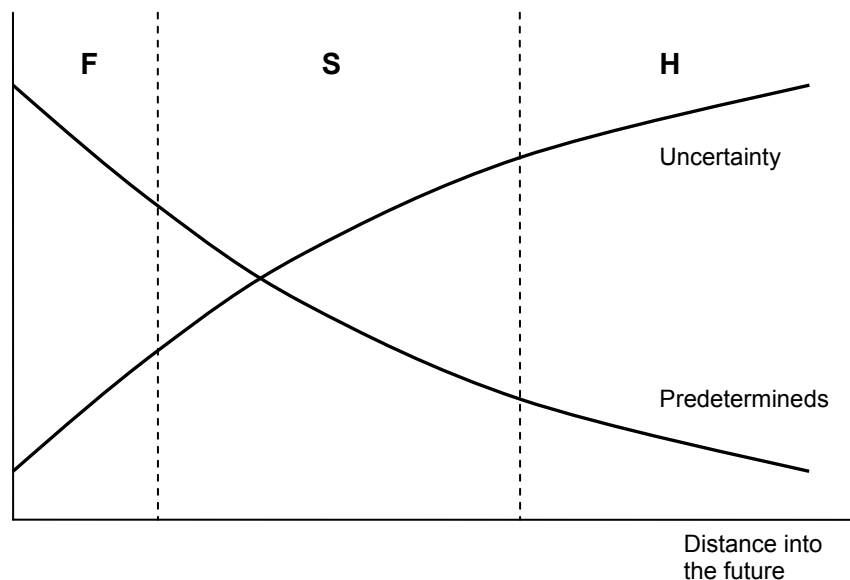


Figure 4. The balance of predictability and uncertainty in the business environment (Van der Heijden, 2005, p.98).

Van der Heijden (2005) suggests that in the short term when level of predictability is high, then the forecasting is the preferred method. In the very long term everything is uncertain and planning in general demonstrates diminishing returns with hope left as the only resort. The middle zone with the reasonable level of predictability and the considerable uncertainty is the place when the scenarios are applied best. Van der Heijden (2005) states that the middle zone on Figure 4 is the place where the structural uncertainty is the most prominent. And thus it is the horizon of strategic decisions.

Van der Heijden (2005) showed how misuse of the scenarios and forecasting can lead to wrong strategic decisions. For example, the forecasting in the middle region is causing overplanning, due to need to meet all uncertainty with various forecasts, and provides a false feeling of security, due to mismatch between predictability embedded in the forecast and real level of uncertainty. On the other hand in the short-term, using the scenario approach can lead to underplanning.

It is obvious that different industries and business environments have a different pace of change and thus the planning horizon in companies operating in these environments differ. Nonetheless, even the most volatile industries have to deal with some issues requiring long term planning, e.g.



capital investments, human resource investments, competence development (Van der Heijden, 2005, p.97). Section ‘4.1 Scenario Creation Process’ demonstrates that scenarios address both uncertainty and predictability of the environment in the long-term.

Scenarios help to **deal with uncertainty** in following ways:

1. Understand the environment. By learning more about the environment scenario based planning helps managers to become more rational in risk taking (Van der Heijden, 2005, p.111).
2. Acknowledge structural uncertainty. By understanding that certain structural shifts might happen, managers can avoid taking unreasonable risks (Van der Heijden, 2005, p.111).
3. Become adaptable. Expanding mental models leads the management and the organization in general to become receptive to unexpected events, understand a bigger strategic picture and take proactive actions (Van der Heijden, 2005, p.111).
4. Avoid denial. Challenging future scenarios help management to get out of the existing mental models and “*think unthinkable*” (Star and Randall, 2007).
5. Avoid paralysis. On another hand scenarios provide a framework for outlining a limited number of the key strategic choices for organization and help managers to make quick and rational decisions (Star and Randall, 2007).

Table 2 summarizes the conclusions of Wack (1984, p.80) regarding the **applicability of scenarios** for different business environments.

Table 2. Applicability of scenarios.

Business Environment	Decision makers' mental models	Scope of decisions	Applicability of Scenario planning
Stable times	Management's mental model and reality match well	Little adjustments and fine-tuning.	Scenarios are not suitable
Rapid change / Complex environment	Mental models do not match reality	Big strategic decisions	Scenario approach can make the difference



According to Wack (1984, p.80) during times of rapid change mental models of decision makers can become “*a dangerously mixed bag: enormously rich detail and deep understanding can coexist with dubious assumptions, selective inattention to alternative ways of interpreting evidence, and projections that are a mere pretence – blind spots and dead angles*”.

2.2 Benefits of Scenario Planning for Strategy

Section ‘2.1.2 Uncertainty and Strategy’ discussed the way the scenarios address the uncertainty in business environment. This section shows other benefits of the scenario planning for the strategic management in organizations especially related to decision making in uncertain business environments.

It was shown in section ‘2.1.1 Rationalist Paradigm’ that one of the reasons of forecasting failure in uncertain environments is the **crisis of perception**. Perception has both individual and group aspects:

- **Individual perception.** Decision makers as individuals act in accordance with the internal version of the reality, which is to greater or lesser extent different from the reality itself (Van der Heijden, 2005). Any individual perceive only a small reality through senses and those signals are cognitively filtered due to the limited attention span and personal decisions what is relevant (Van der Heijden, 2005, p.132).
- **Organizational perception.** Similar to the individual knowledge, organizations have an institutional knowledge - “*a pool of knowledge on the basis of which the organizations can act*” (Van der Heijden, 2005, p.135). According to Miller (1993) the companies that are successful are particularly likely to have a common and simplified mental model, as successful companies develop very good focus and usually have a strong consensus between decision makers.

In order to address the problems of the individual and organizational perception scenarios need to be applied in the strategy process. Global Business Network (2008) gives several examples how scenarios can be applied in organizations, from exploratory to decision making purposes:

- executive intelligence – ability to understand and anticipate changes;



- alignment and visioning – aligning key stakeholders to support a shared vision;
- innovation – continuously innovating ahead of the market;
- risk awareness – anticipating risks in business environment;
- strategy formulating and decision making under uncertainty (Global Business Network, 2008).

According to Wack (1984, p.77) the following two ways to apply the scenarios are the most effective in organizations:

- strategic vision - a clear, coherent and structured understanding of what kind of company the organization wants to be;
- option planning - Understanding what strategic options and alternatives the organization has.

Van der Heijden (2005, p.289) argues that the full benefits of the scenario planning is visible when it is **institutionalized**, i.e. adopted it as primary strategic thinking tool, as opposed to isolated projects and decisions. When the scenario planning is institutionalized, then according to Wack (1984, p.75) contribution of the scenarios is a disciplined approach to thinking and discussing the future. According to experience of Wack (1984) the first generation scenario rarely raises management teams to enthusiasm. But iterative development allows achieving scenarios that aim at the perception of critical decision makers, helping them to understand forces that drive the system, rather than rely on forecasts. Thus the grander goal of the scenarios is *“rediscovering the original entrepreneurial power of creative foresight in context of accelerated change, greater complexity and genuine uncertainty”* (Wack, 1984, p.75).

Scenario helps to **improve perception** both individual and organizational. For example the concept of “memories of the future” described by Ingvar (1985) and Rummelhart (1980) suggests that human mind stores most of its concepts by connecting them to other concepts in temporally organized manner. For example, individuals often think about the future in terms: “if X happens I will react like that”, which is a natural scenario thinking.

Also Van der Heijden (2005, p.6) illustrates how scenarios enhanced the corporate perception at Royal Dutch Shell, during the oil crisis in 1970s. Shell management was able to interpret signals of October 1973 events when oil embargo was proclaimed and shift investments ahead of the competition. He argues that scenarios made people in organization more



perceptive and able to understand events as part of the pattern described in scenarios.

According to Global Business Network (2008) scenarios help strategists to re-perceive assumption about how and why and industry may evolve differently from conventional wisdom, commonly accepted in the organization. Van der Heijden (2005) summarized that “*stretching mental models leads to discoveries*”.

Another, benefit of the scenario planning is the creating **learning-oriented** and adaptive organizational mindset (Global Business Network, 2008). To understand the organisational learning-oriented mindset it is important to introduce the phenomena of group learning which is more than the sum of the individual learnings by organizational members (Van der Heijden, 2005, p.41). According to Lindblom (1959) organizations start to exhibit specific institutional behavior when people align their ideas.

However, Van der Heijden (2005) warns about two pathologies of such alignment: lack of critical mass of consensus and groupthink. Lack of critical mass of consensus is leading to divergent strategic actions by various groups in organization. Groupthink is an opposite and characterized by the lack of diversity in mental models, which leads to a single understanding about how the world works, and thus reduces the organizational ability to perceive and react to disturbances in the business environment. Table 3 presents the summary of the learning aspects that scenarios bring to organizations described by Van der Heijden, (2005, p.49).



Table 3. Learning aspects of the scenario planning.

Individual Level	Group Level
Cognitive device: stories are efficient for giving a variety of diverse information a mutual single context	Strategic conversation language: scenario process allows to include diverse views and multiple interpretations to strategic conversation
Perceptual device: participation in scenario process expands the individual mental models	Conversation facilitation vehicle: scenario discussions taps into knowledge available in individuals across the organization
Reflection tool: scenario process helps individuals to think through ideas generated in the strategic conversations effectively	Mental model alignment tool: scenario process leads to common understanding and coherent strategic action of various organization members

Finally, Van der Heijden (2005, p.7) described also how scenarios were established as a **leadership tool** at Royal Dutch Shell. High level corporate scenarios were translated to detailed scenarios relevant to business units or reams. These focused scenarios were used ad-hoc for decision making and often had an effect of modification of the project to achieve better results in every scenario before it was submitted to top management for approval. This resulted in much more robust projects and empowering lower management to make decisions down the line.



2.3 Analysis of Scenarios vs. Forecasting

Section ‘2.1 Overview of Strategic Management’ introduced the forecasting methods and this section compares the forecasting and the scenario planning methods. The following set of criteria is suggested for comparison based on the literature review:

- approach for solving future uncertainty,
- applicability to various uncertainty types,
- horizon of planning,
- internal vs. external focus,
- applicability to various business environments,
- information quality for strategy,
- potential for verification.

Approach to solving future uncertainty. As it was shown in section ‘2.1.1 Rationalist Paradigm’ the forecasting assumes it is possible to predict the future, based on the known correlation between variables in the business environment persisting over the time. However, another perspective in the strategy thinking states that the future cannot be always predicted based on historical data (Johnston et al., 2008). The scenario theory acknowledges that the future is not predictable and contains uncertainty that cannot be eliminated and suggests that it is dangerous to create such illusion. Whereas, forecasts look at the future outcomes of the business variables, scenarios concentrate on original insight of driving forces and cause-and-effect relationships that move the business one way or another (Van der Heijden, 2005).

Applicability to various uncertainty types. Section ‘2.1.2 Uncertainty and Strategy’ discussed various types of uncertainty in the strategic planning. When it comes to dealing with known risks that have sufficient history to be estimated probabilistically, then forecasts perform better than scenarios. However, the role of scenarios is to unveil possible structural uncertainties leading to dramatic shifts that are not predictable by forecasts. Also in cause of sudden future events that are even not imaginable at present, called by Van der Heijden (2005, pp.93-94) the “unknowables”, neither scenarios nor forecasts can predict such events. However, if the scenario planning is applied, the organization can benefit from its increased receptiveness and ability to react to sudden changes in the business environment.



Horizon of planning. Section ‘2.1.2 Uncertainty and Strategy’ showed that the level of the uncertainty increased as the planning horizon was extended further in the future, and the scenario planning fitted mid- and long-term horizon planning best. Whereas, Goodwin and Wright (2001) suggest that in fast changing environment forecast are unlikely to be reliable in medium- to long-term. Therefore, forecasts are applicable for the short-term horizon planning.

Internal vs. external focus. Essentially forecasts are what Van der Heijden (2005) calls inside-out thinking. Forecasts predict behavior of business indicators based on the external and internal variables and the relationship between them. However, unforeseen variable cannot appear in future models and thus any organization needs to be aware of the perceptual limitation of forecasts. On the other hand, Johnston et al. (2008) suggest that the essence of the scenarios is in evaluating effects of the variables from the external environment. Scenario planner does not start with indicators related to products or markets, but focuses on the main uncertainties facing the organization in the external world. This approach Van der Heijden (2005) calls outside-in thinking.

Applicability to various business environments. Van der Heijden (2005, pp.95-96) states that for the environment with small incremental changes the forecasting is an effective method of future planning. However, as shown in section ‘2.1.1 Rationalist Paradigm’ that most of companies face turbulent business environments from time to time, when forecasts do not provide a viable planning support. Scenarios are designed especially for the major structural changes that are present in fast changing unpredictable business environments.

Information quality for strategy. Van der Heijden (2005, p.109) comes to a conclusion that forecast are very efficient in describing the future as they concentrate complex information in a simple form that can be directly used for operational purposes. Scenarios are not as efficient for decision making, because they provide rich cause-and-effect stories aiming for understanding why things happen, and hence requiring further judgments.

Potential for verification. Forecast can be easily tested in retrospective by comparing the real outcome of a business variable with what was predicted. On contrary, Van der Heijden (2005, p.110) points that scenarios cannot be tested like that since neither the methodology nor the practice guarantees that future is going to be materialized exactly like described in scenarios. The benefit is the extending of decision makers’ mindset to the wider possibilities of future outcomes in the uncertain environment and preparing



them for better decisions and strategies. Table 4 provides the summary of the discussion and analysis.

Table 4. Forecasting and scenario planning comparison.

Criteria	Forecasting	Scenarios
Approach for solving the future uncertainty	The future is possible to predict based on the historical performance	The future is impossible to predict, but it is possible to outline driving forces and uncertainties facing the organization.
Applicability to various uncertainty types	Risks	Structural uncertainties, Unknowables*
Horizon of planning	Short-term	Mid-term and long-term
Internal vs. external focus	Inside-out thinking	Outside-in thinking
Applicability to various business environment	Slow-moving	Fast-changing
Information quality for the strategy process	Efficient	Rich
Potential for verification	Can be tested	Cannot be tested directly

* The scenario planning does not provide the way for predicting “unknowables” in the future, but increases perception capabilities of the organization and help to react to “unknowables” faster and coherently across the organization.

The analysis demonstrated that **forecasts and scenarios** have own area of application when it comes to the future planning. The scenario planning cannot be used as the only approach to future planning nor do scenarios make forecasts obsolete.

Van der Heijden (2005, p.96) suggested the metaphor for forecasting – a car driving with the headlights in the snow storm at night. Only a small portion of the road ahead is revealed and the obstacles can appear very suddenly leaving no time to adjust. However, it does not mean that the driver does not need to use the lights. What important is to understand the limits of the view, the limits of the forecasting.

As the analysis showed the forecasting works very well in the relatively slow-moving and predictable environment when the forecasting approach can provide an insight about the risks in the form that is suitable for efficient decision making. However, the caveat according to Van der



Heijden (2005) is that organizations follow the routine implying that the same situation continues further, when there is always a point when the structural changes appear. In practice Wack (1984) observed that the forecast were not fully rejected in Royal Dutch Shell. They were used in order to understand the forces driving the system and thus fed to the scenario planning.

2.4 Summary

This chapter introduced main concepts of the rationalist approach in the strategic management and focused on how it deals with the uncertainty of the future. Reliance on forecasts as a primary method for the foresight gives sufficient results in certain business environments (e.g. slow moving, stable business environment). But in fast-moving unpredictable business environments forecasting fails and can be misleading for decision makers due to the high environmental uncertainty. Furthermore, the chapter investigated the types of uncertainty and found that forecasting methods are applicable in addressing known risk usually in shorter terms, and the scenario planning methods address the structural uncertainties and the future “unknowables” in the mid-term and long-term planning.

It was described how scenarios are applied in the strategic planning, how they improve the organizational perception, and streamline the rational decision making in the uncertain environments, and explained the benefits of the scenario planning as a leadership tool and a learning tool.

The interest of the thesis is the uncertain and fast-changing business environments and the analysis showed that the scenario planning is a suitable method for the future planning in such environments. Therefore, chapter ‘3 Future Scenario Planning Methodology explores scenario planning main concepts in further detail.



3. Future Scenario Planning Methodology

3.1 History

The scenario planning has a long **history** taking its roots in military war games. However, the energy company Royal Dutch Shell was one of the first and most consistent users of the scenario methodology during the oil crisis of 1973 (Van der Heijden, 2005, p.3).

Kleiner (1996) states that the physicist, mathematician, and nuclear strategist Herman Kahn can be considered one of the pioneers of the scenario thinking. He introduced scenario thinking in RAND Corporation and was a founder of the think-tank Hudson Institute. At Hudson Institute with his staff of about 20 people he started to look beyond military scenarios and focus on culture and economy. In the beginning of 1966, Kahn began to hold meetings for corporate sponsors, with little interest except perhaps from Ted Newsland.

Ted Newsland and Pierre Wack, two Shell employees, decided to try a novel approach for the forecasting, in the later 1960s and early 1970s and followed the example of Herman Kahn. Thus Newsland and Wack for first time aimed for the consistent use of the scenarios in the business environment (Global Business Network, 2006).

That was the time when the **first principles** for the scenario planning were defined. Firstly, scenarios were supposed to be fictional and playful according to Kahn, as opposed to rigorous forecasts that made accurate predictions (Kleiner, 1996).

Also Pierre Wack introduced the concept of *remarkable men* or *remarkable people*. Wack cultivated own network of acute observers with unending curiosity inside and outside company. Those people had the constant attention and the depth of understanding of the way the world worked and started to be involved in the scenario creation (Kleiner, 1996, p.18).

As the history shows Shell was the only major oil company that **managed to be prepared** for the shock of the oil crisis in 1973. As Kleiner (1996, p.34) stated within ten days after the 1973 Arab-Israeli war broke out, the planners had a written scenario package that explained the implications what was happening.

Even though that the benefits of the scenarios for such fast response were clear, initially the acceptance of the scenario planning in Shell met a lot of **hindrance**. Kleiner (1996, p.24) describes that many managers walked away not able to get clear numbers to act on or selected a number from one



of the scenarios and proceed further. The scenario planners were asked the question that is often asked nowadays also – “*which scenario was the most probable?*” (Kleiner, 1996, p.24). The planners had to explain that the scenarios presented various futures and each of them had serious consequences if the company was not prepared regardless of probability (Kleiner, 1996, p.24).

In addition, even after the oil crisis proved the credibility of the scenario planning thinking, Shell managers were very **slow to change their behavior**. As Wack (1984, p.58) observed in reality no more than a third of Shell’s critical decision centers were reacting on the scenario insights. Intellectually managers were able to see and understand the driving forces, but they were committed to old habits.

Hence, Wack (1984, p.58) concluded that every decision maker acted in accordance of the mental model, based on past experiences. The crucial learnings of the scenario makers at Shell are still valid today – the task of the scenario planner is not only to produce a view of the future business environment, but to target for mental models of the decision makers.

3.2 Key Concepts and Terminology

Section ‘1.1 Scenarios in Strategic Management’ provided the definition and the example of the scenarios. This section introduces the terminology helpful for a decision maker that takes future scenarios into use for the first time as defined by Global Business Network (2008).

Focal issue or question is an issue or a question that scenario thinking process addresses. For example, “What is the future of energy market in Europe in 2020?”

Official future is a set of commonly held beliefs in an organization about the future environment.

Driving forces are the major forces outside control of an organization that affect the future. Driving forces can be either **predetermined elements** – forces that are relatively certain in the given timeframe - or **critical uncertainties** – unpredictable forces that have a big impact on the environment with uncertain outcome.

Scenario implication is an insight from scenarios including challenges and opportunities that an organization can face, and options it has in response



Leading indicator or signpost is a sign that an organization can monitor in order to determine if a particular scenario begins to unfold.

It is critical for the decision makers to understand that **purpose of the scenarios** is not to create a precise picture of the future events, but to highlight large-scale driving forces that push future in different directions (Wilkinson, 1995). By making these driving forces visible and discussing them, the managers extend their mental models and thus improve the decision making at present. The example of scenarios provided in section '1.1 Scenarios in Strategic Management' showed several plausible future models that could help to stretch mindset of the decision makers and to prepare the organization for various future outcomes.

The aforementioned example is also a good illustration of avoiding **value judgments**. It is easy to assign "good" and "bad" labels to the scenarios based on individual value judgments. However, according to Van der Heijden (2005) organizations cannot think in these terms. The most useful are the scenarios that are **value neutral** as they deal with the world over which the organization do not have much control. Even though the boundary between parts of the external business environment that can and cannot be influenced blurry, identifying such boundary is a crucial part of the strategic task (Van der Heijden, 2005).

3.3 Scenario Planning Team

Section '2.2 Benefits of Scenario Planning for Strategy' stressed that scenarios is an effective tool for group learning as they involve multi-disciplinary teams. This section describes the participants of scenario planning process and their roles.

The first role is called a **client**. It is an individual or a group of people that are main beneficiaries of the scenario process (Van der Heijden, 2005, p.163). For example, a client can be a management team with the aim of reviewing the general strategic direction of the organization, or a team developing a project of strategic importance.

Stakeholders are other beneficiaries of the scenarios, but not all stakeholders need to be involved in all stages of the scenario building. In particular it is worthwhile to pay attention to stakeholders with power to act in organization. As it was shown in section '3.1 History' more than just intellectual process is required. Decision makers are needed to involve people throughout the organization to align mental models (Van der Heijden, 2005, p.150).



Van der Heijden (2005, p.163) points out that while all participants of the scenario process have a major impact on the success or failure of the project, the client and stakeholders are the ones to decide if the scenario process was successful.

The scenario team must include the **experts**, i.e. people with subject knowledge and “**remarkable people**”, i.e. individuals who can help to open up the discussion and introduce new perspectives (Van der Heijden, 2005). Section ‘3.1 History’ discussed how Wack pioneered the concept of “remarkable people”. According to him they are distinguished from the experts, as they usually have knowledge in the subject area, but also they are capable of thinking broadly to come up with new insights. In other words, “remarkable people” help to reframe the question or situation.

According to Van der Heijden (2005, p.223) some example of the traits the team is looking for are “*resourcefulness of their minds, mastery of own fields, keen and unending curiosity, idea generating, constant attention to the way the world works, acute observation, unique insightfulness, ability to push the edges of thoughts*”. Also it is important to have the people with profound knowledge of the company to make scenarios and insights relevant to the organization (Ogilvy and Schwartz, 1998).

Finally, the **scenario planner** or **facilitator** is the person (or the group of people) involved in promoting and facilitating the scenario process (Van der Heijden, 2005, p.163). Fulton and Searce (2004, p.57) recommends an external specialist, as the scenario facilitator must be skilled in basic facilitation and be able to understand more subjective issues.

Section ‘4.1 Scenario Creation Process’ provides the description how facilitator organizes the whole team to work in practice. Facilitators oversee the composition of the team and according to Ogilvy and Schwartz (1998) they must focus on creating as diverse team as possible including people from variety of intellectual disciplines: social sciences, economics, political science and history. The key to failure is exclusion of the people who are challenging, unorthodox thinkers. Ogilvy and Schwartz (1998) give an example of a scenario team consisting of the intimidating head of a business unit and his direct reports, which has a little value as no divergent thinking most likely to happen. However, it must be remembered that the scenarios are for the benefit of the client and stakeholders and involving them in the process is crucial (Van der Heijden, 2005).

Facilitators and whole scenario team need to be able to discourage disbelief and skepticism, let intuition flow freely, allow people to suggest unthinkable and have strong tolerance for ambiguity (Van der Heijden, 2005, p.221).



3.4 Analysis of Methodology

The scenario planners start with unrelated concerns of the stakeholders about “big issues” that they feel insecure about. This is the first input to the preliminary scenario agenda that starts the process according to a certain methodology (Van der Heijden, 2005).

A few decades of the scenario practice developed various methods and approaches to the scenario-based planning. On the process level the facilitator must decide if **generative** or **adaptive scenario planning** is suitable for the client. Van der Heijden (2005) gives an overview of the both methods that can be summarized as follows. Generative scenario process is an iterative process, starting with the first set of scenarios used as a way to understand the strategic situation better and proceed to next iteration of the scenario set, and repeating until the strategic situation is successfully reframed. In adaptive process scenario building phase is linear and predetermined. In most cases the first or the second generation of the scenarios is used to evaluate the strategy of the organization.

Scenarios that are created during each iteration of generative and adaptive processes can be done according to three widely used methods – deductive, inductive and incremental approaches (Fulton and Scarce, 2004).

Inductive method starts with brainstorming of the possible events in the future and the scenarios are constructed out of these events as story elements. Thus, as Figure 5 shows, the structure of the scenarios emerges by itself (Van der Heijden, 2005, p.236). This method can lead to powerful results, but however it is less structured and relies on the patience of the group to continue working until the final agreement is achieved (Ogilvy and Schwartz, 1998). The caveat is that such unsystematic approach requires a great degree of creativity and tolerance for ambiguity.

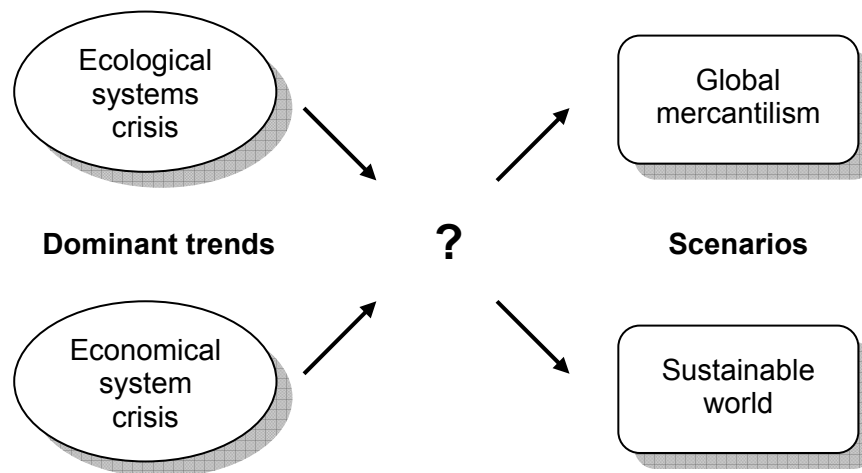


Figure 5. Scenario structure, based on inductive method (Van der Heijden, 2005, p.246).

In **deductive method** the team creates an overall framework first and then fits the pieces of data and possible future events into the framework the way they fit naturally (Van der Heijden, 2005, p.236). In practice a framework is a matrix which ensures scenarios are qualitatively different in a logical way and ensures that the key drivers are taken into account in all scenarios (Ogilvy and Schwartz, 1998) as demonstrated on Figure 6.

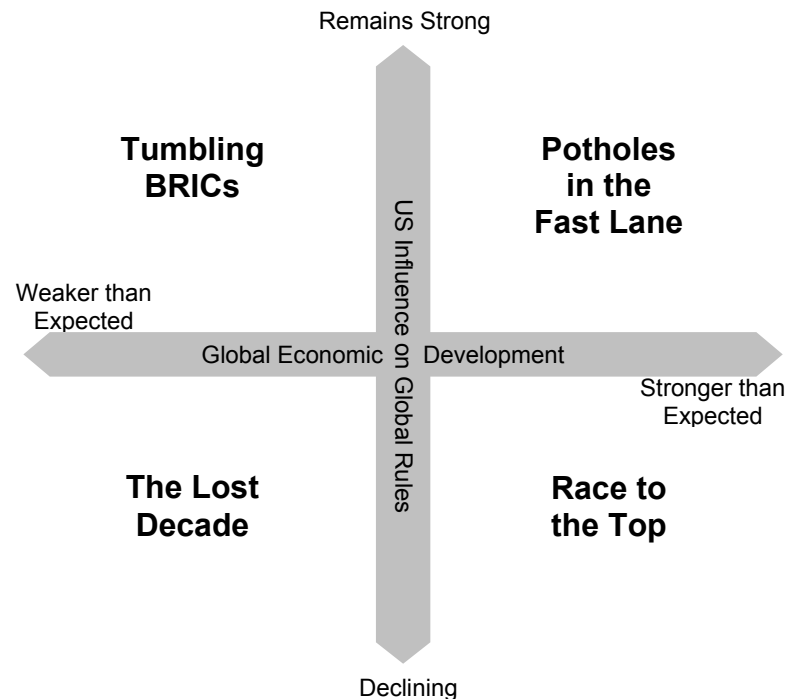


Figure 6. Scenario Matrix: Competitive environment for large multinational US companies (Global Business Network, 2008).

Deductive method is a very structured approach which gives freedom for the creativity in the group and at the same time allows robust estimation of the timing of the scenario creating process.

Third method is the **incremental method**, described by Fulton and Scearce (2004) and Van der Heijden (2005), but sometimes also referred as modified inductive method (Ogilvy and Schwartz, 1998). It starts by articulating the official future and then brainstorming for at least two different scenarios that diverge from the official future. According to Van der Heijden (2005, p.236) this approach aims lower and usually does not produce as insightful results as other methods. However, it may be useful for the clients who are not familiar with the scenario planning approach and are strongly attached to the “official future”. In this case it is easier to start development of the scenarios from a “surprise-free” scenario or a “consensus forecast”, to provide a natural bridge to the future. Often without the “surprise-free” scenario, all future possibilities may appear alien to the managers involved in the scenario planning for the first time and they may reject the project (Wack, 1984).



This research was closely connected to the case study described in section '4.2 Case study: Future Scenarios for Emerging Markets' and therefore the **choice of scenario development method** was driven by the objectives and the constraints of the case study project.

Firstly, the adaptive scenario planning was applied in the case study project, primarily due to the time limitations. The time allocated for the project allowed creation of only one iteration of the scenarios and thus multiple iterations of the generative scenario planning were not feasible.

Secondly, the deductive approach was selected as a method of creating the scenario set. The structured approach was accepted as the most efficient in creating a single set of scenarios within allocated time. Also the incremental approach was eliminated as the team of the external experts working on the scenarios was not familiar with the official future. Further review of the case study and decisions related to the methodology are elaborated in section '4.2 Case study: Future Scenarios for Emerging Markets'.

3.5 Summary

This chapter provided a brief overview of history of scenario based planning and emphasized important findings of the first practitioners of the scenario planning in 1970s. The success stories (e.g. successful strategy for the oil crisis 1973) and the failure stories (e.g. inability of managers to change their mindset) of the first scenarios at Royal Dutch Shell illustrated the valuable learnings for the scenario planning methodology.

Furthermore, the key terminology of the scenario making and overview of the most efficient team structure (stakeholders, experts and facilitators) was introduced for the general knowledge of decision makers and anyone using future scenarios.

Finally, the brief comparison and the analysis of the methodology were provided in order to explain the selected methods for case study project at Nokia. The adaptive and the deductive methods are chosen based on the requirements and constraints of the project. Chapter '4 Future Scenario Practice' shows how this methodology was applied in practice.



4. Future Scenario Practice

This chapter explains the practicalities of creating the future scenario set. In section '4.1 Scenario Creation Process' five steps of the deductive methodology are thoroughly explained. Section '4.2 Case study: Future Scenarios for Emerging Markets' provides a description of the scenario planning case study, demonstrates how the methodology was applied in the project and outlines what modification to the methodology were introduced.

4.1 Scenario Creation Process

Section '3.4 Analysis of Methodology' explained why deductive scenario method was selected for this thesis. This section addresses how deductive method is organized in practice. Different scenario practitioners vary in details of the approach, but most of them are following the basic five step structure as shown in Figure 7.

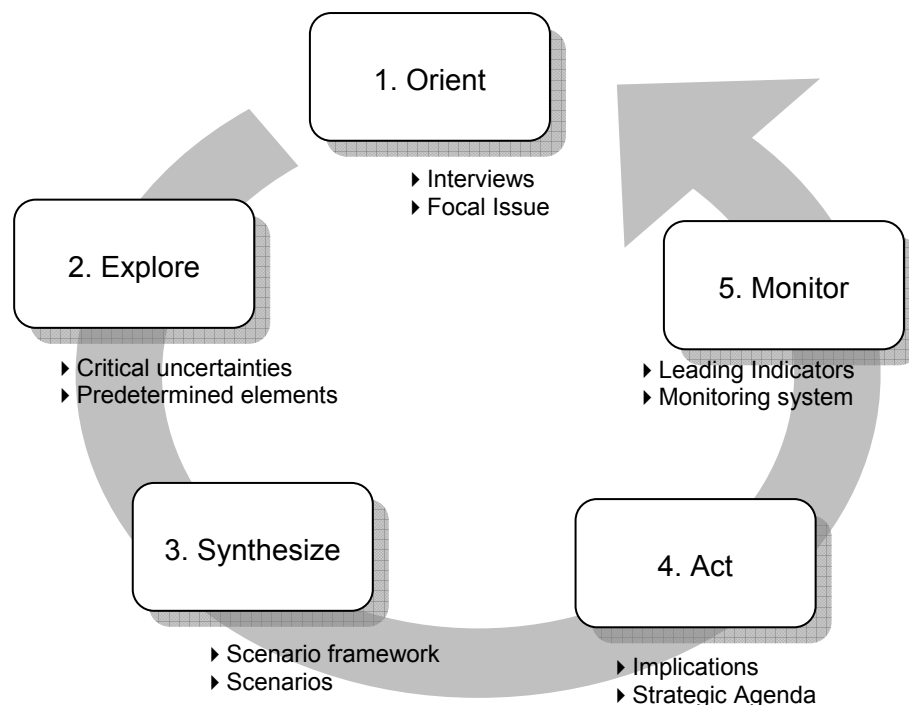


Figure 7. The basic five-phase scenario thinking process (Fulton and Scarce, 2004, p.24).



More specifically this section follows the process in a way is introduced by Global Business Network (2008).

4.1.1 Orient

Scenario creation starts with definition of a **focal question** or an issue. It serves the purpose of the common understanding among of the scenario team. The question can be rather broad - "*What is the future of the former Soviet Union?*" or specific - "*Should we introduce a new operating system?*" (Wilkinson, 1995).

The scenario planning facilitators start with the clients insights of what drives (or should drive) the success of the organization, which are elicited by the SWOT analysis and in-depth **individual interviews** (Van der Heijden, 2005).

According to Global Business Network (2008, p.37-39) a critical success factor for formulating the focal question is the abundance of trust and credibility and the absence of prejudice from the stakeholders. Therefore thorough interview preparation, power listening, assuring confidentiality, avoiding judging comments, open minded approach and following interests of interviewee are essential.

The result of the interviews is the focal question precisely worded in one sentence that is relevant to the stakeholders. Global Business Network (2008, p.33) emphasizes that it should be precise in specifying scope and timing, but also should trigger immediate visions of uncertainty, i.e. "it depends" is the natural first answer to the question.

The focal question is a critical start of the scenario planning as it would be used throughout the process to **test the relevance of the results** of next steps of the process (Wilkinson, 1995). The wording of the question and timeframe are affecting the range of movement and creativity within the scenario (Ogilvy and Schwartz, 1998). Moreover, Van der Heijden (2005) states that a cycle of individual interview and joint feedback generally described as a positive experience in most managing teams.

4.1.2 Explore

As it was pointed out in '2.1.1 Rationalist Paradigm' scenarios are taking into account causal relationships rather than looking at probabilities of the



event. It is enabled by identifying the current primary **driving forces** to understand the dynamics of the future (Wilkinson, 1995).

According to Senge (1990) knowledge can be categorized using “iceberg model” – events, patterns and the structure as shown on Figure 8. Events are the visible part of the iceberg – they can be observed in the surrounding world. But underlying patterns or the structure can help to understand the situation and reason behind the events.

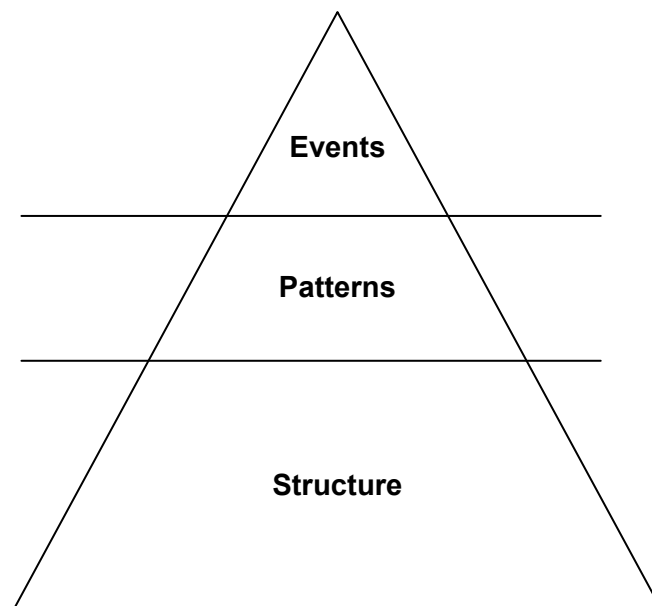


Figure 8. Perceptual iceberg (Senge, 1990).

Therefore, scenario planners have the goal to do more than just reporting the events, but look at the structure as a result of our assumption of causality. The power of the scenarios lies in its ability to logically and casually organize a large range of relevant but seemingly disconnected data and information (Van der Heijden, 2005, p.103).

Global Business Network (2008, p.52) suggests various approaches to identify driving forces, like expert interviews (including external experts) and literature research. However, the most fruitful approach is holding **brainstorming sessions** as it is important to include a large variety of ideas at this phase. A few authors suggest PESTE (also known as STEEP) approach to identifying driving forces to ensure the diversity of the driving forces (Global Business Network, 2008), (Wilkinson, 1995). PESTE is an acronym for Political, Economic, Social, Technological and Environmental issues. Initially Global Business Network (2008) advises to create as many



as 60 to 100 driving forces during the brainstorming. Examples of the driving forces depend on the focal question and the team, but Global Business Network (2008, p.54) provides a few illustrative examples: “*rate of innovation, BRIC middle class, amount and impact of government regulation, relative value of US dollar*”.

It is important to list the driving forces rather than the events. Van der Heijden (2005, p.233) suggests a simple test to distinguish driving forces from the events. As the forces are capable of going up and down over time it is recommended to check whether putting “an increase of” in front of the force definition makes sense. It is possible to speak of an increase in violence, but if words “an increase of” are placed in front of “the fall of the Berlin Wall” it clearly indicates an event.

Further in process, driving forces are used to form the scenario matrix and define the nature of the scenarios and therefore they directly affect on the quality of the scenarios. The facilitator must ensure that:

- The team look further than current events that typically occupy participants’ minds and rather pay attention to the long-term forces (Wilkinson, 1995)
- A variety of driving forces is generated based on PESTE analysis (Global Business Network, 2008)
- The brainstorming is facilitated by the person or team experienced at brainstorming sessions, instead of the stakeholders themselves (Ogilvy and Schwartz, 1998).

Once the list of driving forces is created they are categorized into predetermined forces and critical uncertainties.

According to Van der Heijden (2005, p.101) in a typical timeframe of the business strategy (e.g. from two to twenty years) some systems show enough inertia that allows to make certain predictions. These predictable driving forces which are outside of control of the organization are called **predetermined elements** in the scenario-based planning.

The examples of such predetermined elements are “*slow changing phenomenon (e.g. the development of new oil resources), constrained situations (e.g. the U.S. social security crisis), trends already in the pipeline (e.g. the aging of the baby boomers) and seemingly inevitable collisions (e.g. branch banking vs. banking through personal computers)*” (Ogilvy and Schwartz, 1998). Wilkinson (1995) illustrates that for example in the short term a population is rather predictable - the number of high school students in ten years can be determined to a large extent by the number of elementary school children (Wilkinson, 1995).



The predetermined elements play the role in any story about the future and are included in all the scenarios. Unlike the second category of the driving forces - **critical uncertainties**. According to Global Business Network (2008) critical uncertainties are the “*driving forces that have potential to tip the future in one direction or another*”. They are characterized by unusually high impact and extreme uncertainty or volatility as shown on Figure 9.

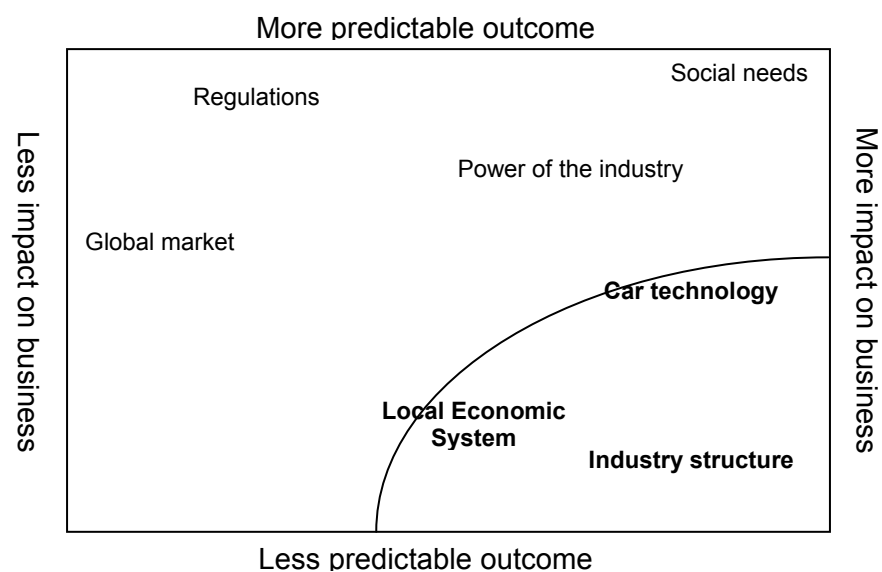


Figure 9. Driving force ranking space (Van der Heijden, 2005, p.249).

According to the Global Business Network (2008) the collective wisdom of carefully selected group is enough for selecting the critical uncertainties out of vast amount of the driving forces. It can be done during the brainstorming session described above. Ogilvy and Schwartz (1998) suggest a simple and effective technique to assign the most uncertain and the most impactful driving forces using “poker chips”. Each person at the brainstorming workshop is given 25 chips and asked to allocate them across the list of 60-100 driving forces according to own assessment - more chips for the driving forces with greater importance and uncertainty and fewer chips (or not at all) for forces of lesser importance and uncertainty. This approach usually gives the first approximation of the critical uncertainties.

Those critical uncertainties are used to form the **matrix axes**. Figure 10 illustrates that each critical uncertainty, when labeled well, should help to identify the upper and the lower extremes of the axes (Global Business Network, 2008).

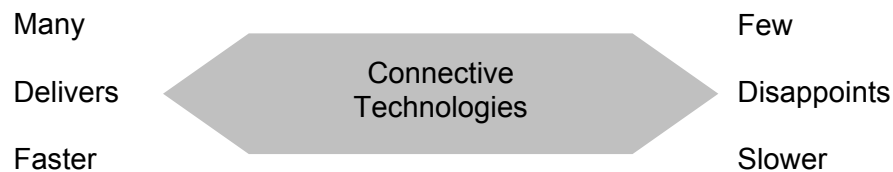


Figure 10. Axis labelling (Global Business Network, 2008).

According to Global Business Network (2008) it is worthwhile to consider different approaches in labeling, since there is more than one way to label the matrix axes.

4.1.3 Synthesize

Next step is generating a **scenario matrix** by combining a pair of matrix axes. Global Business Network (2008) emphasizes that the critical success factor is orthogonality of the axes. In other words it means that the axes represent independent variables that are not correlated with each other.

As described in section ‘2.2 Benefits of Scenario Planning for Strategy’ the scenario planning helps to avoid the “groupthink” phenomena by using sets of the scenarios that make the group ideate broader (Global Business Network, 2008, p.68). The sets of the scenarios can include two, three or four scenarios. At least two scenarios are needed to reflect uncertainty, but more than four proved to be complex to communicate, counterproductive and organizationally impractical (Ogilvy and Schwartz, 1998). According to Ogilvy and Schwartz (1998) using the matrix is the most practical approach as it assures that all four scenarios are qualitatively different in a logical, deductive and non-random way.

Using other methods than scenario matrix may result in creating two or three scenarios and according to Wack (1984, p.77) these are the most dangerous scenario designs. Many managers cannot resist temptation to treat one scenario as a “base-line” and other scenarios as variations similar to forecasting, or treat them as optimistic and pessimistic scenarios in case of two scenarios.

In practice Global Business Network (2008) suggests that finding good matrix requires experimenting with different **combinations of the axes in iterative manner**. According to the Fulton and Scarce (2004, p.29) this is a trial-and-error process and continues until combination of axes form a matrix that presents a framework serving as a strong platform for the



strategic conversation. This approach allows deductive approach to the scenario creation avoiding “good/bad” scenarios (Van der Heijden, 2005).

This stage is a critical stage and it is important to iterate the process until the matrix is produced that is both insightful for the stakeholders and is addressing the focal question. At this stage the skeletal scenario stories start to emerge and it is worthwhile to assign the descriptive names to the scenarios as early as possible. Global Business Network (2008) suggests using a *high concept* for describing the scenarios at this state, which is a “*short phrase or one sentence describing a story idea and including elements of surprise*”. The high concept is meant to grab the attention, to trigger desire to hear more and to promise that big things may evolve from the ordinary.

Next task is to flesh the skeletal matrix scenarios with the **scenario stories**. According to Van der Heijden (2005, p.258) scenario story is “*a narrative that links historic and present events with hypothetical events taking place in the future*”. A good scenario stories can be expressed in very simple storyline diagrams that are fundamentally different between each other (Van der Heijden, 2005).

The length and the depth of the scenario stories may vary depending on the client expectations. However, all scenarios must fit the following criteria (Global Business Network, 2008):

- **Plausible.** Scenarios must be clearly anchored in the past and extend logically in the cause-and-effect way to the future, while staying internally consistent. The influence diagrams are a helpful practical tool to achieve and demonstrate plausibility (Van der Heijden, 2005, p.225).
- **Relevant.** Scenarios must be relevant to the concerns of the client and stakeholders (Van der Heijden, 2005, p.225). The focal question is a practical test of relevancy at any point of the scenario story development.
- **Challenging.** The stories need to be provocative, memorable, arousing a rich imagery and bringing an original perspective (Van der Heijden, 2005, p.258). This is a creative process and people that can reframe the situation in a new inspiring way are instrumental to achieve this goal.
- **Divergent.** Scenario process does not claim that the future materializes as one of the four scenarios exactly, but in practice the future may contain elements of all scenarios. Therefore scenarios

are meant to mark the corners of the plausible futures. These corners are the outer limits of what is plausible, therefore the scenario stories are often exaggerated (Wilkinson, 1995).

The following approaches can be particularly helpful for creating insightful stories:

- Narrative development, taking the basic ideas and enriching them with a beginning, a middle and an end;
- System thinking, studying how parts of the systems interact with each other, making the scenario plots deeper;
- Characters and actor analysis, populating the scenario with illustrative individuals who personalize the plot (Ogilvy and Schwartz, 1998).

Narrative development. A scenario is a story, a narrative that needs to have a beginning, a middle part and an end and should be clearly anchored in the past as illustrated by Figure 11, with the future emerging in a seamless way according to Van der Heijden (2005). A common mistake of the scenario team is to describe a single-state future, say year 2015, which is missing the story-like description of the “moving parts”.

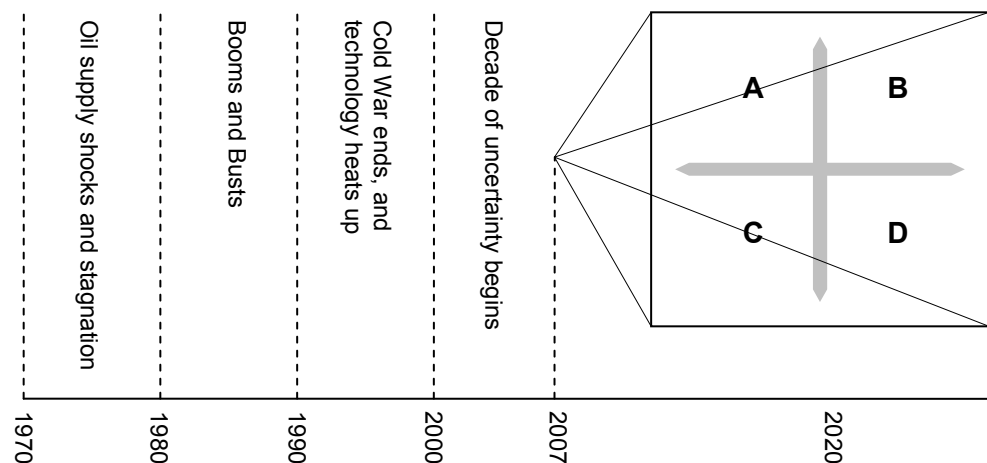


Figure 11. Anchoring scenarios in the past (Global Business Network, 2007, p.9).

One practical approach used by the scenario practitioners is to write newspaper headlines describing the most important events that take place during the course of the scenario, e.g. “*Philip Morris divests cigarette*



business”, “*Dow Jones falls to 4000*”, “*Moore’s Law Disproved*”, “*Eight Hurricane in 20 Days ravages Florida Coast*” (Global Business Network, 2008).

According to Ogilvy and Schwartz (1998) there are a few archetypical plot lines that are used in scenario often - Winners and Losers, Crisis and Response, Good News / Bad News and Evolutionary Change. To utilize the power of narratives, Van der Heijden (2005) suggests using professional story tellers for this part if possible.

System thinking. Application of the system thinking to the scenario plots allows to return to the driving forces created earlier and use the predetermined elements and other driving forces as a part of story telling (Wilkinson, 1995).

Characters and Actor Analysis. Most scenarios are focusing on driving forces, institutions, nations, or companies as opposed to individuals. But sometimes a known or an invented character can crystallize the logic of the scenario.

Even though stories are very powerful way to express the future scenario, Fulton and Scearce (2004, p.30) state that scenario narratives are time-consuming to write and read. Depending on the needs of the client, short description of alternatives futures can suffice.

If scenarios are used as a catalyst for strategy process then the stories are an intermediate step to implications, options and strategic opportunities described in section ‘4.1.4 Act’.

4.1.4 Act

Section ‘2.2 Benefits of Scenario Planning for Strategy’ explained the purpose of using the scenario in the strategic options planning. In order to for scenarios to be used in the strategic planning they need to be enriched with **implications and options**. Each scenario is carefully analyzed by the scenario team and implication of the future scenarios are formulated as the basis of options for a new strategy.

Global Business Network (2008) defines the implications as the “*conditions under which [an organization] need[s] to operate in the future*”, such as challenges, bottlenecks, shortages, emergent needs, and emergent capabilities. The same author defines the options as “*the range of actions an organization takes in the light of the conditions*”, i.e. responses,



workarounds and fixes, new supplies and suppliers, product or service offerings, specific investment, development of activities.

In practice the scenario planners need to imagine what if a scenario comes true. It is preferable to formulate the implications from general to specific, starting with discussing what it means for the external business environment, proceeding to discussing how the future affects on the industry and own organization, and finally proceeding to specifics of how it impacts particular units of organization (Global Business Network, 2008) as demonstrated on Figure 12.

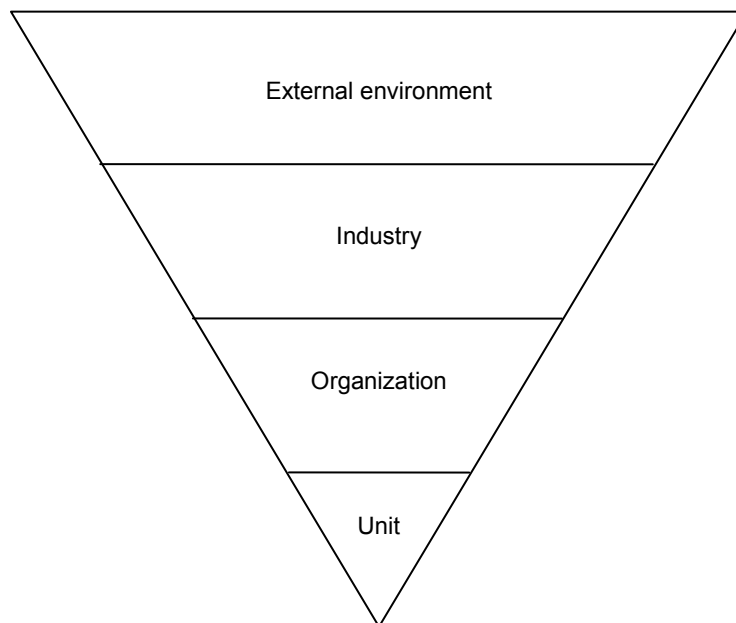


Figure 12. Order of implications development (Global Business Network, 2008).

In practice, implications are created by the scenario team in the **workshop**. The approach is to address one scenario at a time and ensure that the team is familiar with the future scenario narrative. Next step is to concentrate on the aforementioned questions and brainstorm different options until the additional work does not produce any new insights.

As Global Business Network (2008) states there is no completeness proof of this work. Therefore it is important to try different teams and approaches to ensure that most of implications and options are elicited.



Next step is to identify the overlap between the options, which lead towards the discussion of the selection of viable strategies as shown on Figure 13.

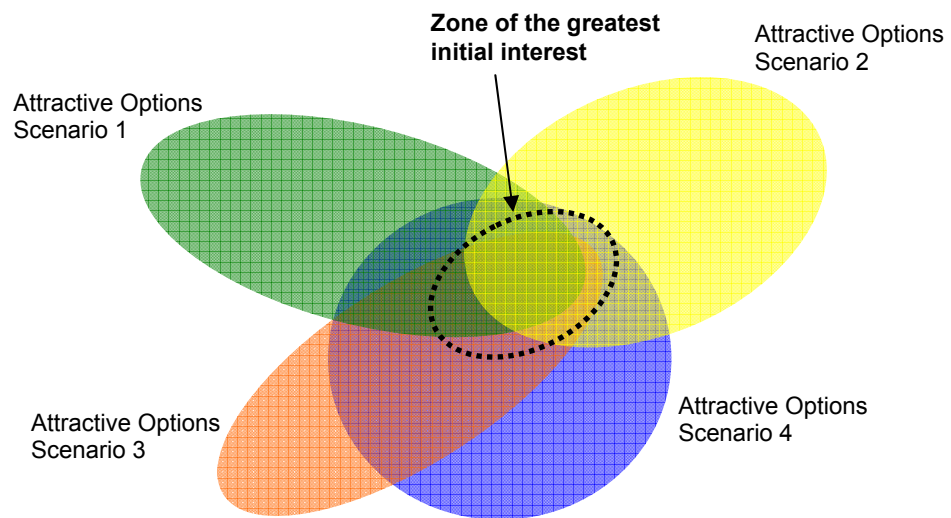


Figure 13. From scenario options to strategic opportunities (Global Business Network, 2008).

A variety of strategic options created in various scenarios allows to decide which strategy to implement. According to Fulton and Scarce (2004) a low-risk strategy works in every scenario, i.e. selecting options that are common for all scenarios, a medium-risk strategy is selecting options that work in two or three scenarios, and finally, a high-risk strategy has the potential of the high reward but it is an option in only one future scenario as shown on Figure 14.

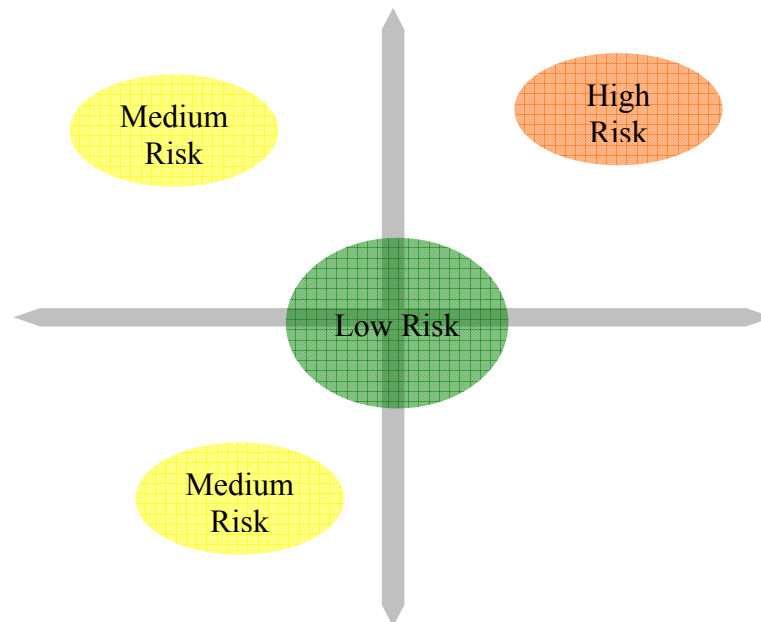


Figure 14. Using scenarios to gauge risk (Fulton and Scarce, 2004, p.48).

In practice, usually an organization considers a mixed portfolio of low-, medium-, and high-risk strategies (Fulton and Scarce, 2004, p.49).

4.1.5 Monitor

As it was shown in section '4.1.4 Act' some strategies are robust for all the future scenarios, but some strategies are valid for only one or some of the scenarios. For such strategies there is a need for the early signs – indicators and signposts - that tells which scenario begins to unfold (Wilkinson, 1995). Signposts and indicators are synonymous terms for the *“events and developments that can be measured, and which are thought to be indicative of a particular path, dynamic or scenario outcome evolving”* (Global Business Network, 2008).

The goal of this part of scenario building is to create a monitoring system to identify and track indicators that can tell when a particular scenario starts to manifest itself. As a result some implication increase its importance and some uncertainties change to the predetermined elements (Fulton and Scarce, 2004, p.33).

As Wilkinson (1995) notes some leading indicators are obvious, e.g. a new legislation or a technical innovation, and some are very subtle, e.g. a gradual social trend. Therefore some of the indicators and signposts can be



already suggested during the scenario development, but some can not be foreseen. Therefore, it is important to have a system in place for monitoring signposts and updating them.

According to Global Business Network (2008) the indicators and signposts are beneficial for the decision makers in several ways:

- helping to notice if a scenario is beginning to unfold,
- providing trigger points that can suggest a possibly new strategic move, and
- alerting to weak signals of potential significant changes.

In other words indicators help to act in anticipation of the future and have a clear coherent strategic response in case of clear signpost emerge.

Unfortunately, in some scenario work this phase is dropped when time for the strategy development is limited. But Fulton and Scarce (2004) state that creating a monitoring system can be a powerful yet simple tool for keeping an organization receptive to the changes in external environment.

4.1.6 Art of Effective Scenarios

The aforementioned five steps are the essential part of the scenario creation. However, following all the steps precisely does not guarantee a successful scenario set. Many scenario practitioners attribute the word “art” to scenarios process. Van der Heijden (2005) called it the “*art of strategic conversation*”, Fulton and Scarce (2004) named it as the “*art of scenario thinking*” and Wack (1984) referred to it as the “*gentle art of re-perceiving*”.

The critical role of the scenario set is to enlighten and to inspire; hence successful scenarios require a creative approach in careful balancing between **known and novel** (Van der Heijden, 2005, p.145). They attach to the existing models in the organizations making them relevant, but also remain novel and surprising. Knowing the client’s mental models and concerns is absolutely critical for success as it was also illustrated during the case study work described in section ‘4.2 Case study: Future Scenarios for Emerging Markets’. Developing a set of the scenarios without the knowledge of the decision makers’ mental models is an impossible job (Wack, 1984, p.77).



4.2 Case study: Future Scenarios for Emerging Markets

4.2.1 Background

The case study project was done in Nokia Design in August 2008 – January 2009. The project was a part of the strategic initiative for creating the future vision and foresight for services for low-income consumers living primarily in rural areas and informal settlements in emerging markets.

On November, 4, 2008 Nokia announced plans to launch Nokia Life Tools, a range of innovative services for agricultural information and education services targeted to non-urban consumers. According to Nokia “*designed specifically for emerging markets, Nokia Life Tools helps overcome information constraints and provides services to this next generation of mobile users*” (Nokia, 2008).

The goal of the project was to create future scenarios for emerging markets and to study implications and opportunities for services for low-income consumers in rural areas and informal settlements. The project planning and the project management were done by the thesis author and it was executed by the team of three Nokia employees and one external subcontracted employee. Some parts of the projects were executed in collaboration with two universities – Srishti School of Art, Design and Technology, Bangalore, India and UniverCidade, Rio de Janeiro, Brazil with twelve participants and eight participants respectively.

The goal of the case study was to verify conclusions of the literature study and analysis, to discover new approaches to existing methodology influenced by the constraints of the project and out to outline methodological challenges that were not fully resolved during case study.

4.2.2 Project Plan

This case study focused on India and Brazil as the examples of emerging markets countries, and therefore in the scope of this case study emerging markets refer only to these countries. The assessment showed that future scenario methods are applicable to the emerging markets, as they present rapidly changing and highly unpredictable markets, and there are significant challenges is creating viable long-term forecasts for such markets. Table 5 presents summarized schedule for the project.



Table 5. Summary of project schedule.

Week	Project planning and preparation	Phase 1: Gaps and Opportunities	Phase 2: Focused Projects	Phase 3: Foresight and Scenario Building	Phase 4: Translation and Communication
June					
July					
August					
September					
October					
November					
December					

The scenario methodology was followed quite closely with certain modifications as a result of the project constraints.

Phase 1: Gaps and Opportunities

All the parts related to scenario methodology are described in chapter ‘3 Future Scenario Planning Methodology’. Section ‘3.4 Analysis of Methodology’ describes what scenario methods were applied and why.

According to the methodology a team of facilitators consisting of three Nokia Design employees and one external subcontractor employee was formed. This team performed initial stakeholder interviews and combined background material based on the secondary desk research.

The facilitator team organized a team of experts for scenario workshops and research work. In this case the team of experts consisted of professors and students at Srishti School of Art, Design and Technology, Bangalore, India and UniverCidade, Rio de Janeiro, Brazil. The sought expertise was the knowledge of the local culture, understanding of the rural consumer and knowledge of the competitive landscape in own areas. The team included members with different background and competences. For example the



project in Bangalore included six students specializing on Visual Communication Design and four students specializing on Textile Design.

A notable modification to the scenario process was introduced on the stage of team forming. Even though the scenario process recommends the involvement of the stakeholders in scenario creating workshop, implementing this requirement was problematic due to the time constraints of the stakeholders and need to travel to locations in India and Brazil. Therefore special arrangements were created by facilitators to keep the stakeholders regularly informed about the progress. Application of the scenario methodology and a modification to the methodology are summarized in Table 6.

Table 6. Scenario methodology in Phase 1.

Project Phase	Description	Scenario methodology	Modifications of methodology
Phase 1: Gaps and Opportunities	Preparatory phase for collecting information and creating the input for scenario workshops	Forming the team	Separate workshops with experts and stakeholders
		Interviews with the client and stakeholders	
		Collecting background information	
		Selecting methodology	

Phase 2: Focused Projects

The Phase 2 followed the process of creating future scenarios described in section '4.1 Scenario Creation Process.' According to the process the teams were first organized to work on the driving forces, critical uncertainties and scenario frameworks and after were regrouped and continued working on the scenario stories, indicators and signposts. The scenario methodology did not suggest any preferences for team allocation, and therefore it was decided to allocate a team per each scenario, based on the experience with other scenario projects.



This phase was also modified to accommodate the specifics of the project. Firstly, the expert group was given a focal question instead of formulating it themselves. The focal question was created by the team of facilitators, based on the interviews with the stakeholders.

Secondly, it was planned that the expert group continues creating scenario stories after the workshop during the field study in rural areas in order to finding signposts, indicators and illustrations for scenario stories in the current rural environments.

Finally, the expert group was not assigned to work on implications and options. The reason is that implications are always specific to internal affairs of a company and the groups of the experts were not familiar with the internal environment and the strategy of Nokia. Instead of working on implications, the expert groups were given the task to assess the potential of services verticals (e.g. agriculture, entertainment) and created a design concept specifically each of the scenarios. Application of scenario methodology and the modification to methodology are summarized in Table 7.



Table 7. Scenario methodology in Phase 2.

Project Phase	Description	Scenario methodology	Modifications of methodology
Phase 2: Focused Projects	Workshops on location in India and Brazil. Primary goal was to conduct user studies in rural areas, collect relevant information for the scenario workshops and create a set of four scenarios	Focal question	The focal question was given to the expert team by the facilitators
		Driving forces	
		Critical uncertainties	
		Scenario frameworks	
		Scenario stories	The scenario stories were refined during one week field study
		Indicators and signposts	The indicators were refined during one week field study
		Implications and options	Expert group did not create implication. Instead, the concepts of services were created for each scenario.

Phase 3: Foresight and Scenario Building.

Phase 3 focused on combining the scenarios and insights created during Phase 2 into a single scenario set and documenting implications as described in section ‘4.1 Scenario Creation Process.’ The difference from a traditional approach was handling this task only by the facilitator team with partial participation of some collaborators. Application of the scenario methodology and the modification to the methodology are summarized in Table 8.



Table 8. Scenario methodology in Phase 3.

Project Phase	Description	Scenario methodology	Modifications of methodology
Phase 3: Foresight and Scenario Building	Analysis of the material from Phase 2 and aggregating it into a single scenario set	Implications and options	Implications were created by the facilitator team together with some stakeholders

Phase 4: Translation and communication

Finally, the last phase of the project focused on communicating the scenarios. The scenario methodology did not suggest any specific approach to communication of the final material. In this project communication was organized as a set of workshops with stakeholders.

4.2.3 Execution

Section '4.2.2 Project Plan' explained how the case study project was structured and how scenario methodology was applied to achieve the goals of the project. It was also shown what changes to methodology were suggested prior to the project start. This section reflects on the project execution and discusses what practical challenges appeared during the execution of the project, how they were dealt with and also what changes to the project planning and the scenario methodology application were made during the project execution.

Project planning and preparation

Project planning and preparation of the project was executed according to the schedule and included the stakeholder identification, the project plan proposal and review, the facilitator team formation, the expert team planning and early negotiations with stakeholders regarding the scope of the project.



In practice, it was characterized by high involvement of the client, stakeholders and the project manager. Client and stakeholders demonstrated support for and interest in the project.

Phase 1: Gaps and Opportunities

The first goal of this phase was to get a profound understanding of the background and issues connected with the subject of the project - mobile services in rural areas of emerging markets. The second goal was to get an insight to the concerns of the stakeholders about the future and thus formulate the focus question as described in section '4.1.1 Orient'.

This part consisted of the desk research, brainstormings and interviews with the stakeholders by the team of facilitators. The comprehensive desk research was instrumental in later phases of the project as initial reading material for the experts. However, the interviews with stakeholders were mainly concentrated around current concerns and little time was spent discussing future concerns. Also it became clear at this stage that even though stakeholders had shown the significant interest in the project, the decision makers in stakeholder organizations would have a limited involvement in the workshops.

Phase 2: Focused projects

This phase was a critical part of the project during which actual scenarios were created. The goal of the Phase 2 was to run the workshops and field user studies in Bangalore, India and Rio de Janeiro, Brazil together with collaborating universities. A summary is provided only for the workshop in Bangalore, since the workshop in Rio de Janeiro had a similar structure.

The workshop in Bangalore had ten participating students from Visual Communication Design and Textile Design departments and two professors of Shrishti School of Arts, Design and Technology supervising the work of the students. The students and the professors had roles of the experts on the local culture and service design for population of rural areas, as this group has been previously involved in research projects of rural India. Facilitators from Nokia Design were present throughout the whole workshop which contributed positively to the result of the workshop.

The workshop lasted three working weeks with the involvement of the participants on average 9-10 hours a day, with the goals shown in Table 9.



Table 9. Structure of the scenario building workshop.

Week	Location	Activities
Week 1	Bangalore, India	Introduction to the workshop Scenario creation workshop (driving forces, critical uncertainties, scenario matrix, preliminary scenario stories)
Week 2	Four villages in rural areas near Bangalore, India	User studies (interviews, observations) Scenario refinement (scenario stories, indicators and signposts)
Week 3	Bangalore, India	Scenario refinement (scenario stories, indicators and signposts) Concepts creation

The process of workshops in Phase 2 was described in sections ‘4.1.2 Explore’, ‘4.1.3 Synthesize’ and ‘4.1.5 Monitor’. Mostly the facilitation team and the experts were involved in this phase. The partial participation of the stakeholder representatives allowed to introduce the view of the stakeholders. However, the decision makers of the stakeholder team were not participating in this phase.

The structure of the workshop in Rio de Janeiro was very similar. However, the following differences created substantial challenges during the workshop in Rio de Janeiro – the lack of competence in service design in the expert team, not sufficiently diverse group combination and the language barrier.

Phase 3: Foresight and Scenario Building

This phase had the goals to:

- analyze the scenarios created during Phase 2 looking through the lenses of relevance to Nokia and stakeholders,
- combine the scenarios created in India and Brazil in a single and a coherent scenario set,
- prepare the material for next phase “Translation and Communication” to the stakeholders



In practice this phase was handled by the team of facilitators with occasional involvement of the stakeholders for the review of the material. Firstly, the scenarios created during Phase 2 were reviewed and the implications and the options were created. As described in section '4.1.4 Act' implications and options are the points that connect scenarios with the current organizational issues. It was not possible to create the implications and the options in Phase 2 since the experts were not familiar with the internal strategy of Nokia.

Also team of the facilitators observed a significant difference between the scenarios created in India and Brazil both in the scenario matrixes, the content of scenario stories and the depth and quality of material. Therefore, a significantly more time was spent in trying to create a coherent scenario set than was allocated in project plan originally.

Finally, the scenario presentation contained a great deal of material that had to be focused, simplified and made both inspirational and actionable for the decision makers.

Phase 4: Translation and communication

During this phase the scenarios were communicated to stakeholders by the team of facilitators. Also the workshops with the stakeholders were held for translating the scenarios into actionable items.

One example of such workshop included the analysis of the current and the future portfolios of the services for emerging markets on the scenario matrix. The client's portfolio of services was placed on the scenario matrix to the most relevant future scenario where the service maximized the returns. Even though the evaluation was made based on the subjective judgment of the group of the facilitators and the stakeholders, it demonstrated that current and future portfolios are focused only on one out of four scenarios. Therefore additional evaluation of the portfolio was suggested.



4.3 Summary

This section overviewed both the theory and the practice of creating scenarios. The section ‘4.1 Scenario Creation Process’ discussed how scenarios are created following these steps in the following order:

- focal question,
- driving forces,
- critical uncertainties,
- scenario framework and stories,
- implications and options,
- indicators and signposts.

In section ‘4.2 Case study: Future Scenarios for Emerging Markets’ the thesis introduced the case study based on scenario planning project at Nokia Design. The author of the thesis was the facilitator team leader and the project manager; therefore the case study had very detailed access to the project and control over the method-related decisions in project.

Section ‘4.2.2 Project Plan’ introduced the schedule of the project and explained how scenario methodology was applied throughout the whole project. The project applied adaptive and deductive methods for the scenario building due to the structured approach and manageable estimation of the schedules required for the scenario delivery. This section also outlined changes to the methodology due to certain project constraints.

Section ‘4.2.3 Execution’ described how the project was executed in practice and outlined unforeseen challenges and changes to methodology, e.g. limited involvement by stakeholder decision makers during the expert workshops, challenges with the expert group structuring and the problem of combining set of the scenarios created by different expert groups. This section also explained the improvement that scenario planning brought to stakeholder, like demonstrating that the portfolio of the services was concentrated around one future scenario.

Next, chapter ‘5 Analysis and Discussion’ provides the analysis and the discussion of case-study findings and evaluation of the research questions formulated in section ‘1.2 Research Questions and Goals.’



5. Analysis and Discussion

This chapter contains a summary of the crucial findings from the case study described in section '4.2 Case study: Future Scenarios for Emerging Markets'. Furthermore, the research questions formulated in section '1.2 Research Questions and Goals' are revisited and discussed based on the literature study and the practical case study work.

5.1 Case Study Findings

The goal of the case study was to verify the conclusions of the literature study and the analysis, to discover new approaches to existing methodology influenced by the constraints of the project and the to outline methodological challenges that were not fully resolved during the case study. This section provides the analysis and discussion of these goals.

Section '2.1.2 Uncertainty and Strategy' demonstrated that scenarios are used best when applied to **fast moving, unpredictable environment** solving the problems of the possible structural uncertainties in the mid-term and long-term, rather than immediate risks in the short-term.

The case study proved that indeed the scenario planning is well applied to uncertain and rapidly changing business environments like India and Brazil, where the events are results of the complex combination of political, social, economical, environmental and technological drivers. The scenario planning was able to include these drivers into the rich and insightful stories about the future.

The case study scenarios also addressed possibilities of structural uncertainties and shifts and thus proving that scenarios are suitable tool for such type of uncertainty. The project practically proved that scenarios improved the understanding of the environment and structural uncertainties described in '2.1.2 Uncertainty and Strategy'. For example, section '4.2.3 Execution' showed that scenario workshops with stakeholders found that the current and future portfolio of stakeholder services could operate successfully only in one of the scenarios. The rest of benefits of scenario planning summarized in section '2.2 Benefits of Scenario Planning for Strategy' were not analyzed in the scope of the case study.

Section '3.4 Analysis of Methodology' summarized that the **deductive method** was selected for the project. The case study proved that this method delivers its benefits and creating the results within the allocated time, if the



process described in ‘4.1 Scenario Creation Process’ is followed. The section ‘4.2.3 Execution’ showed the importance of stakeholder involvement in the project and diversity in scenario workshop groups that was proved in practice.

Section ‘2.2 Benefits of Scenario Planning for Strategy’ discussed implications of institutionalizing scenario planning in an organization, i.e. adopting the scenario planning as a primary strategic tool. The practical assessment of these implications was out of the scope of the case study as it required wider adoption of scenario-planning during a substantial period of time to be thoroughly analyzed.

Section ‘4.2.2 Project Plan’ described how scenario planning methodology was applied throughout the project and also the **changes to the methodology** that resulted from the constraints of the project.

Firstly, ‘3.3 Scenario Planning Team’ presented the literature review on the composition of the team and outlined three main participants of scenario process: facilitators, experts and stakeholders. In the case study project the constraints of the project required the separate workshops with experts and stakeholders with partial participation of the stakeholder representatives in the scenario creation workshops. However, higher participation of the stakeholders in the scenario creation workshops including the decision makers was recommended for the future scenario planning projects.

Secondly, section ‘4.2.2 Project Plan’ noted that experts were not familiar with Nokia strategy and it ruled out the possibility to formulate implications of the scenarios for Nokia strategy according to the original process described in section ‘4.1 Scenario Creation Process’. Thus experts were encouraged to create concepts for each scenario, which in turn were analyzed separately by the facilitators and the stakeholders to create implication of the scenario. This induced the additional work overhead, however did not have visible impact on the quality of the results.

Finally, sections ‘4.2.2 Project Plan’ and ‘4.2.3 Execution’ explained that scenario ideation was organized in “workshop – research – workshop” structure. It allowed experts to create draft scenarios, then validate them with help of user studies and observations during the field research in rural areas, and finally use these findings to enrich and to finalize the scenarios. In the field study each team was assigned one scenario and it helped team members to gain deeper understanding of the future as it took time to immerse themselves in a particular scenario narrative. This practice was



highly beneficial for the quality of the final scenarios and was recommended for further scenario projects.

Section '4.2.3 Execution' demonstrated changes to methodology that were not considered in the original planning and were caused by **issues encountered during project execution**.

During preparing final set of material for communication it was realized that scenario presentation contained the great deal of material that had to be focused. Since the primary target of scenario insights are executive decision makers, the presentation was simplified to a concise executive summary and made both inspirational and actionable. The recommendation for the future scenario projects was to allocate sufficient time for creating such executive summary, and consider them as critical gates for further attention of decision makers.

The case study project also encountered the problems that were resolved with the creative solutions and workarounds at the time, but **required more research for the future scenario projects**.

Firstly, section '2.3 Analysis of Scenarios vs. Forecasting' presented comparison of forecasting and scenario planning based on literature review. The case study proved that selecting the scenario planning was suitable decision for the foresight project in the fast-moving business environment. However, the practical comparison with forecasting methods in such situation was not in the scope of the case study.

Secondly, section '4.2.3 Execution' outlined the practical issues of combining scenarios that were created by various expert teams addressing the same focal question. This was a significant hurdle during the execution of the case study project, as the significant differences were found in approach to problem understanding, in the scenario matrixes, in the content, depth and the quality of material.

Global Business Network (2008) quotes Jay Ogilvy saying that "*there is no right scenario matrix*", and it is reasonable to expect that various group of experts creates different scenario sets. However, the challenge for application of scenarios planning in strategy of multinational companies is to organize work of geographically distributed experts on a single focal question and how to combine different scenarios in one coherent scenario set.



Finally, section '3.3 Scenario Planning Team' advised high level involvement of the decision makers in the scenario creating process. On one hand, section '4.2.3 Execution' listed practical of challenges in involving of stakeholder decision makers, especially without previous experience of using the scenario planning methods. On another hand, the scenarios provided more engaging, insightful and inspiring way for strategic conversation of decision makers. As section '4.1 Scenario Creation Process' demonstrated that the focal question interviews generally have positive experiences of management. But the challenge was to sustain the involvement of the decision makers throughout the whole process of scenario creation and implementation in strategy. In other words, practicalities of institutionalizing scenario approach discussed in section '2.2 Benefits of Scenario Planning for Strategy' could be suggested a challenging research area.

5.2 Research Questions Analysis

Section '1.2 Research Questions and Goals' had formulated the following research questions for the thesis:

- 1) How the future scenario planning can be applied to the strategic management in rapidly changing and unpredictable business environments?
- 2) What are the limitations of the tool and the alternative approaches?
- 3) What are the best practices in applying this tool?

This section analyses how these research question were answered both during the literature study, the analysis and the practical case-study project work.

How the future scenario planning can be applied to the strategic management in rapidly changing and unpredictable business environments

This thesis had analyzed the forecasting and the scenario planning methods, their drawbacks and benefits of each approach and how they were applied in the strategy planning practice.

The scenarios planning has clear benefits for the strategic planning in uncertain and rapid changing environments as shown in sections '2.1.2



Uncertainty and Strategy’ and ‘2.2 Benefits of Scenario Planning for Strategy’. In fast-changing environments a big source of uncertainty is structural shifts and unknown, unimaginable events. Scenarios are primary targeting to mitigate these types of uncertainty by preparing the company to very diverse future outcomes and making the company more skillful in reacting to sudden changes. Scenarios stretch mental models and help to avoid denial in the decision making. At the same time they reduce paralysis and assist managers in big strategic decisions with the mid- and long-term impact. Individual and organizational perceptions are significantly improved by cultivating learning-oriented and adaptive organizational mindset.

The forecast, on the other hand, works well in relatively stable times and in short-term planning as section ‘2.1.2 Uncertainty and Strategy’ shows. Since the forecasting is based on extending historical performance into the future it deals with uncertainty in the form of known risk, characterized by sufficient historic precedent. Using scenario planning for such risks, leads to underplanning.

However, section ‘2.3 Analysis of Scenarios vs. Forecasting’ states that it does not mean that forecast should be discarded during uncertain times. They can be used to understand the forces driving the industry and contribute to the scenario planning. Also, forecasting provides very efficient information upon which decision makers can act immediately. However, it is important to understand limitations of the forecasting when they are used in the strategy process.

Section ‘5.1 Case Study Findings’ came to conclusion that practice proves that the scenario planning could be applied in uncertain business environment using the example markets in India and Brazil. The case study demonstrated that the scenarios were helpful in understanding the environment and acknowledging the structural uncertainty.

The forecasting was not analyzed as a part of the current case study, thus no practical evaluation regarding applicability of forecasting for uncertain business environments was made.

What are the limitations of the scenario planning in the strategy process and the alternative approaches

Equally, it is important to understand limitations of the scenario planning methods when they are applied in the strategy process.



Firstly, section ‘2.3 Analysis of Scenarios vs. Forecasting’ described that scenarios are not efficient for decision making. Scenarios do not contain exact figures related to the consumer demand or required production capacity. They provide very rich information that comprises insight about the complex uncertain environment, but do not suggest direct answers. Even though that the goal of the scenario is to expand mental models and avoid paralysis in decision making, often managers are rejecting the scenario planning as it put them in the uncomfortable situation of confronting uncertainty and the need of decision making not based on the rigid forecasts.

Secondly, section ‘2.3 Analysis of Scenarios vs. Forecasting’ outlined that scenarios cannot guarantee that the future materializes exactly as described, but it is rather a combination of several scenarios. The goal of the scenario is to stretch the boundaries of the mental models and sometimes to demonstrate extreme future outcomes. Therefore, often scenario stories themselves are exaggerated. In addition, in practice it is difficult to test scenarios in retrospective, i.e. assess if any of the futures came true. The scenario work must be assessed based on the quality of strategic options and decisions that it affects.

Finally, Camillus (2008) describes strategy as a wicked problem – a problem that “*cannot be solved, but can be tamed*”. Especially this thinking is valid in rapidly changing environment where fast adapting, learning and reacting, can be more preferable option than spending resources on creating the picture of the future that might not materialize.

From the point of view of the case study there are some practical problems connected to the involvement of several scenario groups that are described in section ‘4.2.3 Execution’ and analyzed in ‘5.1 Case Study Findings’. Case study found out that scenario methodology described in section ‘4.1 Scenario Creation Process’ does not scale well when several scenario groups were geographically distributed and worked independently on solving one strategic problem.

Section ‘5.1 Case Study Findings’ stated that in practice the project showed that success of the project depends on the involvement of the stakeholder decision makers throughout the whole process. In the practical organizational work this was not fully feasible, thus the touchpoints of involvement of decision makers had to be carefully planned.



What are the best practices in applying the scenario planning

It was shown in section ‘3.4 Analysis of Methodology’ that the scenario planning has a variety of methods, and that this thesis was focused on describing the adaptive scenario planning and the deductive approach using the scenario matrix. The reason that this approach provides a sufficiently diverse set of scenarios and provides quite precise time estimates during planning. The best practice is to follow the methodology closely and allow a creative approach in bringing new insight for decision makers by balancing between known and novel as described in section ‘4.1 Scenario Creation Process’.

Section ‘4.2 Case study: Future Scenarios for Emerging Markets’ demonstrated that the scenario methodology was applied quite thoroughly. However, it also showed that certain modifications to methodology were inevitable. Some of them did not improve the scenario results, but some were very instrumental in improving the quality of the final scenarios. Particularly, approach of “workshop – research – workshop” described in section ‘5.1 Case Study Findings’ contributed to validating and enriching scenario stories as well as increasing involvement of the scenario team. Also in order to influence mindsets of the decision makers the scenarios had to be memorable and inspiring. Thus the ability to communicate complex things in a simple form of the scenario communication material was emphasized.



6. Conclusions

This thesis addressed the research questions – how the future scenario planning was applicable for the strategic management in uncertain and fast changing business environments, how it was applied in practice and what the limitations were. In order to answer the question both literature review and practical case study was performed.

The following learnings can be summarized based on the **literature review**.

- The scenario planning is applied when companies want to prepare themselves for the structural uncertainties and unpredictable events in the rapidly changing business environments. The scenario methods well applied for the mid- and long-term strategic planning, whereas other methods like the forecasting perform better on the short-term horizon and in a relatively stable environment.
- The scenarios can be applied to various areas of the strategic planning, but are mostly helpful for strategic vision and strategic options planning. The scenario process helps to deal with uncertainty, improves the individual and organizational perception and creates a learning-oriented, adaptive organizational mindset.
- The main goal of the scenarios is to influence mental models of decision makers and therefore it must maintain a delicate balance between known and novel, between plausible and futuristic, between pragmatic and inspiring. The scenario planning requires both analytical and creative skills from its participants.

The **case study** outlined the parts of the scenario methodology that were the most important to pay attention to during implementing the scenario planning in practice.

- Understanding stakeholders' mindset, getting early support from them and involving them in the process was extremely critical for the success of the scenario planning project. Even though the whole scenario team had affect on the final scenario set, it was the stakeholder who took the scenarios further in strategy process and thus decided on the success or failure of scenario planning project.
- The development of the scenario benefited from iterative approach when scenario creation workshops were followed by the research work. Integrating the research work into scenario planning helped to validate future assumptions and made the narratives more plausible



and deeper. It also allowed the team to immerse into the future scenario thinking.

- Ability to communicate complex scenarios in simple easy to grasp terms was a challenging task to do. However, it was an important factor for the successful reception from the decision makers. Scenarios had to be formulated to communicate uncertainty, showed consequences and inspire for further action in a short form and during limited amount of time.

Finally this work showed the scope of the applicability of the scenario planning and its **limitations** for the strategic process.

- Scenarios are not precise. Compared to the forecasts, the scenarios are rich with insights, but do not contain information that can be immediately taken into the planning. Moreover, scenarios do not guarantee that any of the described future scenarios materialize as described. In many organizations it creates difficulties for decision makers as it confronts them with uncertainty and with the need of decision making not based on the rigid forecasts.
- In some cases, especially in turbulent business environments, finding the right answer to the strategy can be impossible, but fast learnings from trial-and-error approach and visionary decision making can make the difference. Thus it should be taken into account that real business environment is more complex compared to what any planning, including the scenario planning, can foresee. Scenario planning should be only used if it really helps an organization make better decisions today.
- Finally, it was found that creating scenarios in distributed groups is significantly more complex than constructing them only by one group. This is the valid concern in companies distributed globally.

Last three challenges outlined the possibilities for the future research of the scenario planning in the strategic management.

Scenarios can deliver great results when they are created and applied correctly for solving the suitable challenges and when they are used in conjunction of with other methods of the future foresight and the strategic planning, rather than a single tool to rely on.



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