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in

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**Scenario Planning in Logistics and Supply
Chain Industry: DB Schenker AG Case study.**

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Abstract

Global world is going to be more complex and dynamic to predict future. The future of the supply chain management and logistics sector will be affected by many threats and opportunities from uncertain future environment. There are different models for overcoming uncertainty. Scenario planning is one of these models and helps to coping with uncertainties. This paper applied scenario planning as a strategic management tool to determine future trends and future possible strategies for DB Schenker AG which is in the logistics and supply chain industry, and explore what is predictable and what is uncertain in this industry. This paper tries to answer “Which strategies will DB Schenker AG have to focus on for 2030 to keep and increase their customer confidence and shareholder value in an uncertain future environment?” There are different methods for scenario planning, this paper edited Tapinos (2009) method to reflect logistics industry and competitors. This paper focused on long range planning, industry drivers, competitors and competences. “*Nano world, Urban and Social Life, Regulated world*” scenarios were developed and tried to present how the world might be in 2030, in order to help DB Schenker AG and rethinking its current strategies to adapt future. These scenarios based on main uncertainties which are Oil price, technological changes, megacities and urbanisation and level of emissions rate. Four strategies were suggested to cope with future uncertainties these are “Special sector solutions, Technology based Logistic management, Consultancy services and find after 4PL (5PL) and finally Organisational learning by Collaboration / co-opetition.”

Overall, this paper helps to understand uncertain world and provide practical scenario planning examples in Logistics and Supply chain industry.

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Abbreviations

3PL: Third Party Logistics

4PL: Fourth Party Logistics

5PL: Fifth Party Logistics

AIM: Advanced Institute Of Management

BCG: Boston Consulting Group

CO2: Carbon Dioxide

CRM: Customer Relationship Management

DB: Deutsche Bahn

DHL: Deutsche Post and DHL

E7: Emerging Seven Countries (Brazil, Russia, India, China, Mexico, South Africa, Turkey)

EIA: Us Energy Information Administration

EU: European Union

FAS: Feasibility Acceptability Suitability

G7: Group Seven Countries (The USA, The UK, France, Italy, Germany, Japan, Canada)

GDP: Gross Domestic Product

GPS: Global Positioning System

IMF: International Monetary Fund

IT: Information Technology

KN: Kuehne Nagel

KYOTA: Kyoto Protocol

MER: market Exchange Rate

MNE: Multinational Enterprise

NAFTA: North American Free Trade Associations

PESTEL: Political Economical Social Technological Environmental Legal

PEC: Parcel Express Courier

PPP: Purchasing Power Parity

PwC: Price Waterhouse Coopers

RBV: Resource Based View

RFID: Radio Frequency Identifications

SCM: Supply Chain Management

SCP: Structure Conduct Performance

SOP: Strategic Organisational Planning

SWOT: Strengths Weaknesses Opportunities and Threats

T&L: Transportation & Logistics

TNT: TNT Express and Logistics

TOWS: Threats Opportunities Weakness and Strengths

UNESCAP: The United Nations Economic and Social Commission for Asia and the Pacific

USA: United States of America

Chapter 1 Introduction

1.1. Background of the problem

Production is going to be more global and producers are part of the global value chain. Therefore, Logistic and Supply chain Management Company's (SCM) importance were gradually increased. According to Datamonitor market research (2008) the global logistics market forecast would reach a value of \$1,040.6 billion in 2012, an increase of 29.3% since 2007. However, massive competition, fluctuation in oil price and recent global crises affected the sector. According to Wack (1985), managers and executives are trying to anticipate major shifts in the current environment. However, uncertainty has become the rule and not anymore the temporary exception".

The global logistics market has been affected in recent years by the retail sector. Therefore, modern logistics hubs are getting more important due to their productivity. Moreover, companies start using high tech device such as RFID and GPS to reduce their cost and risk (Datamonitor, 2008). In order to show and create future scenarios this paper focused on DB Schenker AG is a case study which is one of the leading globally integrated logistics service providers. (DB Schenker, 2011) It combines the units "DB Schenker Rail and DB Schenker Logistics and providing rail, land transport, air, ocean freight and contract logistics/SCM." (DB Schenker, 2011) DB Schenker is trying to provide global best solution to customer by using local aspect. In order to show its position in the market, following statement can be useful.

- No. 1 in Europe in rail freight
- No. 1 in Europe in land transportation
- No. 2 worldwide in air freight
- No. 3 worldwide in ocean freight
- No. 5 in global contract logistics (DB Schenker, 2011)

On the other hand, Schenker faced problems which include unforeseen future environment, rivalry and efficiency pressure in global logistic sector. Schenker needs to find future position in global value chain and consolidate its position. Therefore, Schenker as a case study will help to determine how will be the logistic industry in the future and which scenarios might be happened in this sector. This paper concerns and asserts that the development of scenarios for 2030.

1.2. Research question

This paper focuses on one of the biggest freight forwarder company in the world. Research question of this paper will be as follows;

“Which strategies will DB Schenker AG have to focus on for 2030 to keep and increase their customer confidence and shareholder value in an uncertain future environment?”

In order to answer this question this paper focuses on long term strategy development by using one of its tools “*scenario planning*”.

1.3. Importance of the study

Scenario planning has been used for long range planning to support making decision in uncertain environment situation (Schoemaker, 2002 pp. 47). Recently, an increasing number of authors have focused on scenario planning in logistic and supply chain industry due to increasing in company growth rate and major challenges in environment such as carbon footprint. These researches focus on territories, general future of logistic or specific area such as carbon foot print. Previous papers generally focused global and industry scenarios, however this paper focused on company to apply scenario planning in practical way.

1.4 Scope of the study

This paper focuses on one of the biggest freight forwarder, and emphasises integrated logistics, global production, maritime logistic and competitors. Logistic is crucial activity for production. However, logistics is very broad topic to research on it. Hence, this paper focused on Schenker and its global operation area. Scenario planning is one of the most common qualitative tools of future (O’Brien, 2004). “Scenario planning is a process for rediscovering the original entrepreneurial power of creative foresight in contexts of accelerated change, greater complexity, and genuine uncertainty” (Wack, 1985). According to Chermack and Van der Merwe (2003) “Scenario planning is a technique for raising decision makers’ awareness of several plausible futures.” Thus, this paper just focuses on long term and trying to prepare several *global logistics* plausible futures.

1.5 Structure of Dissertation

This paper provides practical scenario planning research. Chapter 2 focuses on literature review for strategy, strategy development, strategic planning and scenario

planning. Chapter 3 focuses on research methodology. Chapter 4 starts with macro, micro analysis, after that, chapter 4 provides uncertainties, scenarios and strategies for Schenker. Chapter 5 is discussion part and focuses on findings of the research. Finally Chapter 6 focuses on conclusion and most important findings on research.



Chapter 2 Literature review

This chapter focuses on literature review and compares different authors for strategy development, strategic planning, scenario planning and scenario planning for logistics and supply chain industry.

2.1 Strategy development and its history

In order to understand strategy development, definition of strategy would be good start. Most of the strategy definitions show an organisation's relationship with environment and uncertainties.

We can use Henry Mintzberg's concept of strategy as a new definition of strategy. Mintzberg (1991) define strategy "*Seeing ahead, seeing behind, seeing above, seeing below, seeing beside, seeing beyond and seeing it through.*" Strategy development is one of the most important parts of strategy and operation. Strategy and its development process were used in the ancient Greece and China. Sun Tzu is the most known strategist in the ancient age "*If you know the enemy and know yourself you need not fear the results of a hundred battles.*" (Tzu 1981) Sun Tzu's this idea is still using by companies.

Before The World War Two, most of the manufacturers had produced for military. After that, companies started to reduce cost, shift work force blue collar to white collar (Kirkegaard, 2003) they started to apply strategy development. After the world war two, main function of strategy is solve the problem and use resource in efficient way. US and German companies especially automaker start using strategy as a decision making process. 1945 to 1960, companies and general strategy literature focused on structure, and decision making for instance, the structure-conduct-performance (SCP) paradigm of Bain (1951; 1956) had used to the most popular theoretical framework that explain external industry structure. Ghobadian and O'Regan's, (2008) developed classification model. According to this article strategy development phase was divided 4 stages. Those are "1960-1980 foundation, 1980-1985 Transformation 1985 to 1990 exploration 1990 to 2000 formation."

2.1.1 Foundation (1960-1980)

During this period three breakthroughs books were published. According to Chandler "Strategy and Structure" book (1962), Strategic and administrative changes depended on relationship between growth, structures and causality. Second Author is one of the famous business guru, Igor Ansoff and his book "Corporate strategy: An analytic approach to business policy for growth and expansion" He focused on strategic decision and future. Ansoff identified "four key component for mapping future "*Product and*

market scope; growth vector; competitive advantage; and synergy.” Corporate strategy is background book of his other books 'Business Strategy' (1969), 'From Strategic Planning to Strategic Management' (1976), 'Strategic Management' (1979). The last one was written by Learned Christensen, Guths and Andrew, “Business policy” (1965). Andrew et al mentioned that SWOT analysis that is one of the most commonly used model in strategy and decision making.

2.1.2 Transformation (1980-1985)

This period started with Porter’s breakthrough books “Competitive Strategy” (1980) and “Competitive Advantage” (1985). And his article "From Competitive Advantage to Corporate Strategy (1987)", According to Porter, firm’s performance depended on industry environment where it competes in. Porter’s five forces industry analyses were born in this period. After these books academic and empirical studies changed to be more business environment based. Levitt (1983) stated that communication and transportation technologies increased worldwide Travel and then homogenized world markets were born. According to these improvements in technology, consumers in different parts of the world were going to demand the same goods. Thus, multinational companies started to produce single kind of products. According to Lewitt (1983) optimum global strategy is producing standard product. According to Hamel and Prahalad’s (1983; 1985) firms can attack rivals and defend their market shares by leveraging technology through distribution channels and strategic responsibility.

2.1.3 Exploration (1985-1990)

Williamson’s “The economic institutions of capitalism: Firms, markets, relational contracting” (1985) book, opens a new perspective in strategy development. He mentioned transaction cost theory which affects transaction between company and environment. Transaction cost related to exchanging resources with the environment with these factors.

- Environmental uncertainty
- Risk
- Opportunity
- Core asset
- Bounded rationality.

Eisenhardt, (1989) came with agency theory that explain its position in transaction cost theory which is agent relationships should reflect efficient organization of information

and risk mitigation costs.

2.1.4 Formation (1990-2000)

Strategy development started to focus on two main factors. One of these is internal factor such as competitive advantage and asset. The other one is external factors such as environment and rivalry. Formation period starts with Prahalad, and Hamel, (1990). They mentioned importance of competences of company. They showed stepping stone approach and competences tree. After that, Barney's (1991) breakthrough article "Firm Resources and Sustained Competitive Advantage", focused on resources and he stated that resources are valuable if they add value to customer, and they need to be rare inimitable and sustainable. This method known as a "resource based view (RBV)" After Barney Peteraf (1993) mentioned resource based view by using two aspects assets and competition, in order to explain assets and mentioned heterogeneity and imperfect mobility, for competition Peteraf used ex ante and ex post limits to competition.

2.1.5 New world and strategy. (2000-...)

After 2000 Prahalad show new vision to business strategy;

- Prahalad and Lieberthal (2003) mentioned that new business and importance of customer.
- Prahalad and Ramaswamy (2004) mentioned importance of customer and corporation between customers.
- Prahalad (2004), The last book of bottom of the pyramid open new vision to company and they started to focus on other part of the consumer pyramid. In new world bottom of the pyramid and corporate social responsibility are important parts of the strategy.

In foundation period strategy and strategist focused organisation structure and corporate strategy best known author of this period is Ansoff and he studied corporate strategy, strategic planning and growth. In transformation period strategy and strategist generally focused on industry and environment analysis, Porter is the best known author of this period and he mentioned importance of external analysis by using five forces. In exploration phase focused on transaction cost and its transaction cost economies theory. Formation period focused on resource and company capabilities and competences. In new world and strategy period generally focused on CRM bottom of the pyramid and Prahalad is the most known author in this period. Nowadays strategy focuses on structure, external environment, internal environment and transaction, competences and resources, CRM and

bottom of the pyramid.

2.2 Models and Tools for strategy development

Origin of strategy comes from Greece and military and it refers to manoeuvring and positioning before the rival manoeuvres. However, nowadays strategy is using for business direction. Strategy development process helps company to analyse organization and see future direction. (Mintzberg, 1994) Strategy development helps setting a framework for strategic direction, and helps company to determine criteria to make a decision. It focuses on answering these questions “*Where are we going?*” and “*How are we going to get there?*” Strategy implementation starts after answering these two main questions. (Mintzberg 1994) Porter (1996) quoted “*The essence of strategy is choosing what not to do*“. What he suggested is that the most difficult decisions in strategy development are not deciding what to do, but rather deciding what you are not going to do. Different models and tools have been developed for strategic development to understand organisation assets, environment and opportunity. Dyson and Foster (1980) and Mintzberg (1994), argued that there is not specific numbers of stage in strategy development. However, Ansoff (1965) divided strategy development in three main stages, “*Strategy formulation, Strategy implementation and Strategy evaluation*”. Most of the strategic management books (Johnson, Scholes and Whittington. 2008) follow this model. Strategy formulation (known as strategy position) emphasises on organisation and external environment and their analysis. Strategy implementation part (known as strategic choice) represents strategic options and its practical progress. Strategy implementation is the last part and it generally focuses evaluation and feasibility of options.

Ansoff (1965) argued that strategy is linear progression. However, Mintzberg (1980) stated that, linear thinking in strategy based on dangerous assumptions it is risky. Harrison and Pelletier’s (2000) level of strategic decision success article modelled the strategy process which is shown in Figure 2.1.

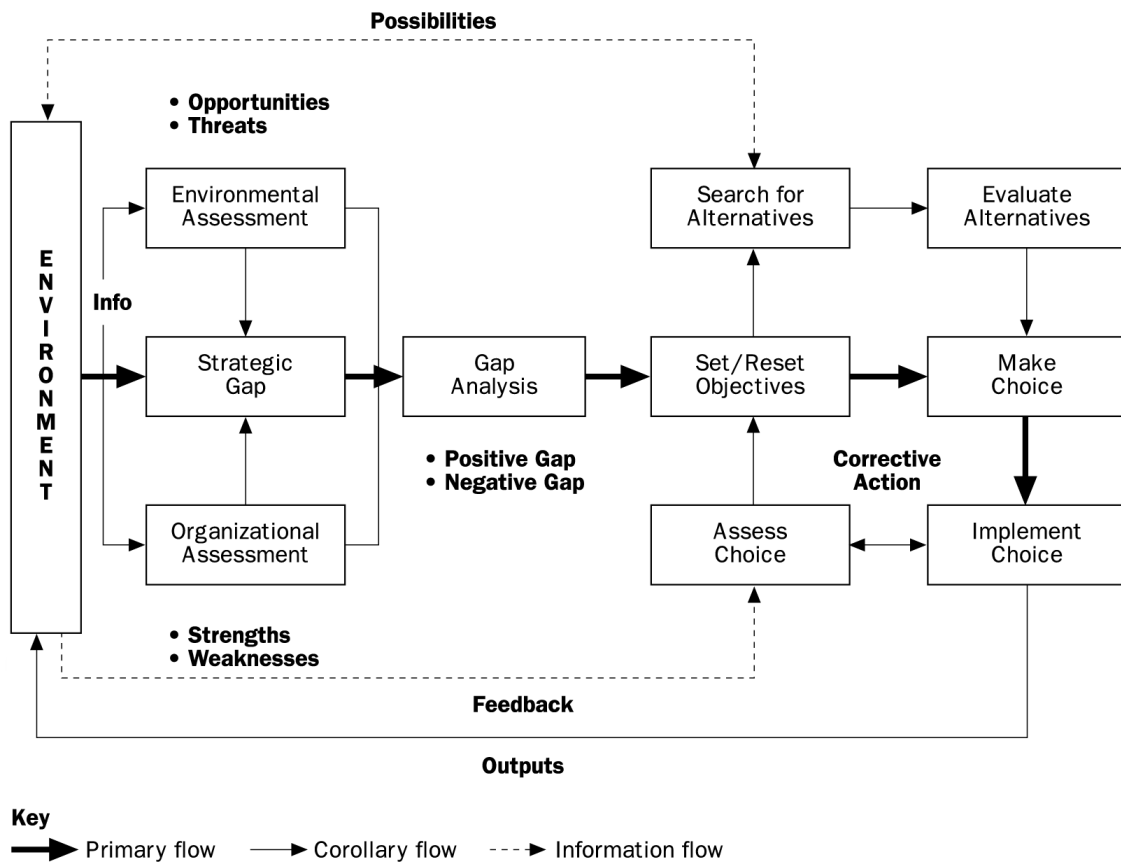


Figure 2.1 Strategic Decisions Process (Harrison and Pelletier's 2000)

However, Mintzberg (1987) mentioned that the traditional way of strategy implementation just focuses on deliberate strategies. Mintzberg suggests that emergent strategy which was established before writing goals vision mission and procedures is the useful way of strategy implementation. (Figure 2.2) Additionally Mintzberg offered five different strategy and known as 5P of strategy (1) **Strategy is a Plan:** Strategy can be defined a direction or a guide (2) **Strategy is a Pattern:** Strategy is defined as consistency in behaviour over time strategy as a pattern which looks past but trying and planning to future. (3) **Strategy is a Position:** Strategy is described as locating or positioning something. For example particular products in particular markets (4) **Strategy is a Perspective:** Strategy is an organization's significant way of doing things according to his article. (5) **Strategy is a Ploy:** Strategy is defined as a specific "manoeuvre" intended to competitors move.

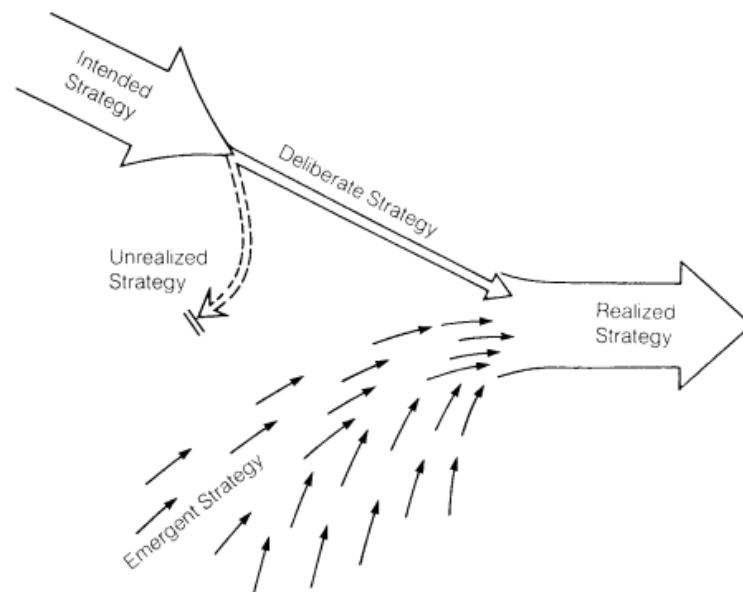


Figure 2.2 Mintzberg emergent strategy model. (Mintzberg 1987)

In order to understand tools and models Advanced Institute of Management (AIM) survey which were conducted 9 of business school in UK and prepared by Jarzabkowski and Giulietti. (2007) can be useful. Survey tried to prioritise 20 main strategy tools. These strategy toolkits were SWOT, Scenario planning, Value Chain, Porter's generic strategy, Bowman's strategic clock, Globalization matrices, Dynamic capability analysis, Method of expansion matrices, corporate parenting models, Porter's diamond, strategic group analysis, Ansoff product/market grid, merger/acquisitions matrix, pestel, industry life cycle, resource based view, porter's five forces, portfolio Matrix, key success factor and core competences analysis.

According to research, eight out of twenty tools were used more than others. These are SWOT; Scenario Planning; Key Success Factors; Value Chain; Core Competences Analysis, Porter's Five Forces; PESTEL Analysis; and Resource-Based view. According to Jarzabkowski and Giulietti (2007) analysis, most of these strategic tool kits are for strategic analysis and strategic choice but less useful for strategy implementation.

Stenfors, Tanner and Haapalinna (2004) conducted a research about strategic tools which was shown different result. Although scenario planning was second position in AIM research, it was in the seventh in Stenfors et al research. There is another strategic tool usage analysis (Clark, 1997; Frost, 2003) According to all of these authors research Swot analysis is the best known and common one. Swot perceived as simple, practical and easy use tool. It looks both internal factors of firm and external factors of environment and try to evaluate them. (Clark, 1997; Hill and Westbrook, 1997; Pickton and Wright, 1998 Frost,

2003, Dyson, 2004, Stenfors 2004; AIM research, 2006) Generally researcher argue that strategic perspectives come from two aspect inside out or outside in of the company. Swot covers both two aspects.

Value chain analysis, core competences analysis and resource based view are in inside out perspective tools. Value chain analysis designed by Michael Porter in bestseller book *Competitive Advantage: Creating and Sustaining Superior Performance* (1985). Value chain represents the value adding activities in the firm itself. According to his book primary activities are inbound logistics, operations, outbound logistics, marketing and after sales service. Support activities are firm infrastructure, human resource management, technology and procurement. It is useful for outsourcing decision. The other inside out perspective tool is core competences analysis which was defined Prahalad and Hamel (1990). They argued that "*Core Competences*" are some of the most important sources of uniqueness. The main idea of core competence is, companies need to have something that provides unique value to customer which makes good profit and they showed this idea in competences tree model. According to AIM research, Resource based view is one of the most common inside out tool which aims to determine the strategic resources of firm. Barney (1991) and Peteraf (1993) pointed out resource based view by using two different aspects. Barney just mentioned resources. Peteraf mentioned both asset and competition aspects. Resource based view try to explain capabilities and competitive advantage as well. Barney (1991) stated that, If resources are valuable (capacity to bring value to organizations) rare (high demand) inimitable (imperfectly imitable) and non substitutable (imperfectly substitutable), we can assume that they are strategic resources.

Porter's five forces and Pestel analysis are in outside in perspective. Five forces theory designed by Porter (1979; 1980) which is generally looking for micro environment of company. Porter five forces analysis tries to understand industrial organisation by looking new entrants, substitutes, suppliers, customers and rivalry among the existing competitors. Pestel analysis is one of the common analysis which looks macro environment by using six aspects political, economical, social and cultural, technological, environmental and legal.

Key success factor and scenario planning are differing from the others. These two are generally using in strategic planning. Key success factor are element that helps to organisation to reach and achieve its mission and goals. In order to determine key success factors companies generally looking at both outside and inside of the company. First company needs to look outside of the company and understand necessity of the sector and

then determine it by using companies own resources and goals. Scenario planning is one of the most common ways of looking long future according to strategic management tools research. (Dyson, 2004; Hill and Westbrook, 1997; Pickton and Wright, 1998, Clark, 1997; Frost, 2003, Stenfors 2007; AIM research 2006) Scenario planning is used for more flexible long term plans. Schoemaker (1995) stated that “Scenario planning stands out for its ability to capture whole range of possibilities”.

On the other hand, there are other useful tools. Such as Ansoff product/market grid, BCG matrix, Blue Ocean strategy, road mapping, value discipline, core quadrants, strategic alignment model, Curry’s pyramid (Assen, Berg, Pietersma 2009)

In conclusion, strategic development is process which includes three steps, (strategy formulation, strategy implementation and strategy evaluation). There are many possible tools for strategy development SWOT; Scenario Planning; Key Success Factors; Value Chain; Core Competences Analysis; Porter’s Five Forces; PESTEL Analysis; and Resource-Based view models are most common models in strategy development. However companies are using combination of these tools.

2.3 Strategic planning

Strategy is overall aspect and planning process. Nowadays highly competitive environment leads company to plan their future. Strategic planning’s main reason is uncertainty in the world.

Hamel and Prahalad (1994) stated that strategic planning involves thinking about future, for future, analysis of environmental is essential. According to Mintzberg (1994) “*Strategic planning is not strategic thinking. One is analysis and the other is synthesis*“. He mentioned that strategy planning is process and it start with analysis of company and environment. There are different ideas about the time horizon of strategic planning. “*Strategic planning projects forward as 3 to 5 years (Barry, 1998) or 10 to 20 years (Herman, 1990; Hunt, et al., 1997; Rumble, 1986).*”(Cited in Pisel 2001) On the other aspect, tactical plans have the shortest outlook of typically less than a year (Barry, 1998; Herman, 1990; Rumble, 1986). According to Pisel, process of strategic planning can be shown in “10 step” which was shown in Figure 2.3.

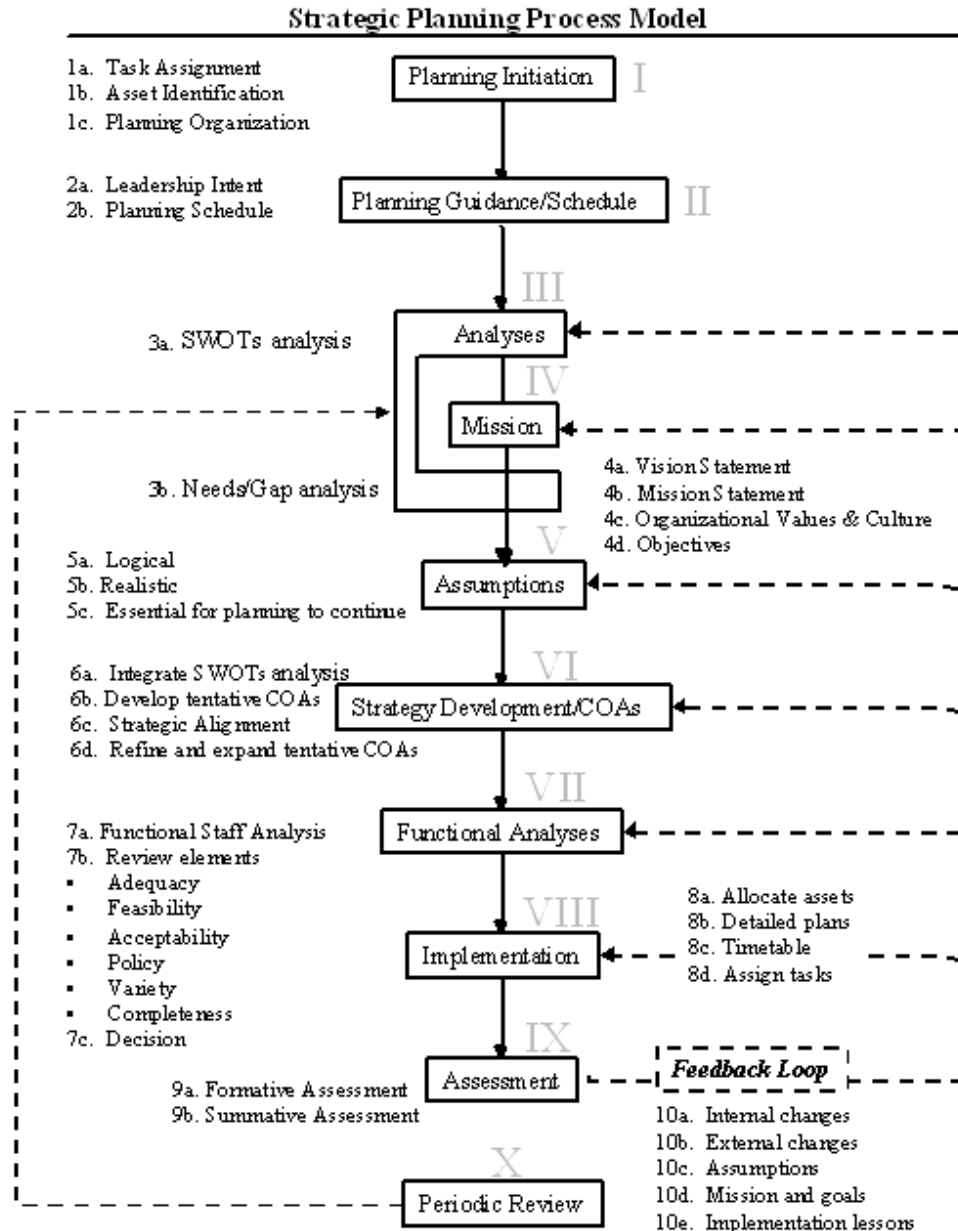


Figure 2.3 The process of strategic planning. (Pisel, 2001).

Strategy development includes all strategy process, however strategic planning is the first step of strategic development process. Pisel's (2001) ten steps model just represents, one part of Mintzberg (1997) 5P's of strategy, "strategy as plan" Strategic planning provides starting point of strategic development, and tries to understand direction, needs of company and plan companies move.

According to Mintzberg (1994) "Planners should not create strategies, but they can provide data to help managers to think strategically and program the vision" In order to help managers, planner needs to follow some process and need to do analysis about company Bailey (1981) stated that after gathering information planning workshop will be

useful. According to his article, In the planning workshop following question needs to be answered.

- *Where are we now? (The Situation)*
- *How did we get there? (Our Momentum)*
- *Where are we going? (The Direction)*
- *Where should we be going? (Desired Direction)*
- *How will we get there? (The Strategic Plan)*

Nominal group and Delphi technique can help strategic planning and planning workshop. Delbecq, Andrew Van de Ven and Gustafson (1975) describe the combination of nominal group and Delphi processes for strategic planning. They mentioned combination of nominal group, delphi and workshop. Johnson et al (2008) mentioned that, all organizations do not live in similar environments. These differentiations arise from complexity. Therefore these complexities will affect the type of planning.

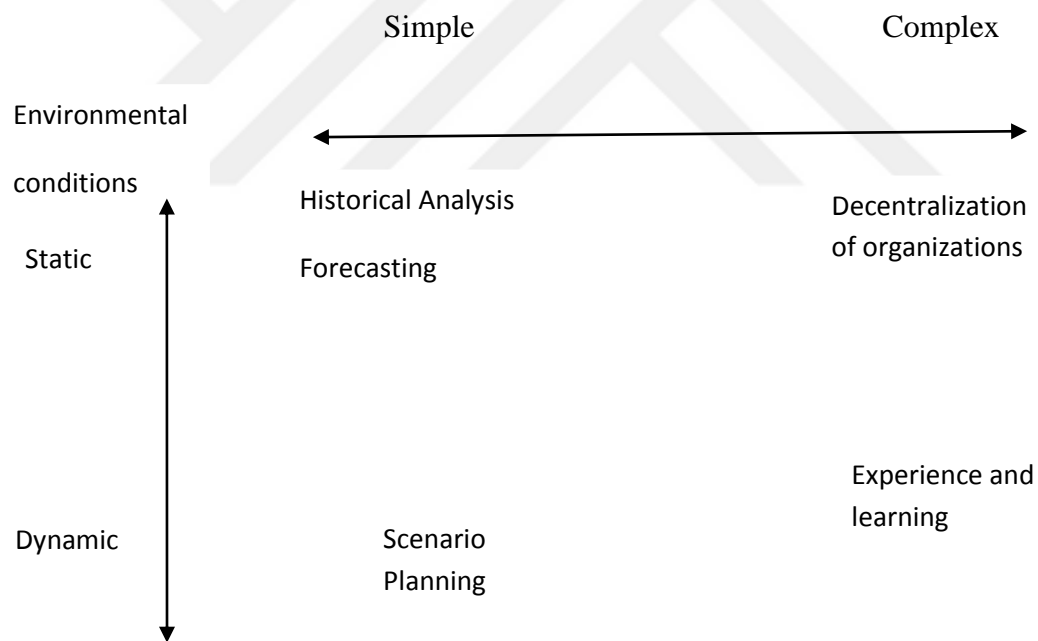


Figure 2.4 Strategy development in environment contexts (Johnson et al 2008 p 423)

Strategic planning is not a good choice in complex environment. Organizational changing and learning may be useful. Historical Analysis and forecasting is useful way of planning in static and simple environment, when environment going to be dynamic, forecasting may be wrong decision. Scenario planning is way of planning for dynamic

environment. Walton (2009) suggested that uncertainties can be managed by scenario planning. Moreover, scenario planning help to evaluate effect of future changes in uncertainties. Walton suggested that scenario planning can be useful method of strategic planning. More information is given in further section.

Van der Heijden (1996) mentioned three schools of strategic planning and management these are rationalist, evolutionist and processural. Rationalist school depends on tacit knowledge and the main task of strategist is, finding a best solution. Strategist thinks that future and environment is predictable. Van der Heijden stated that in evolutionist school depends on the idea of “process of random experimentation”. Processural School argued that deliver strategies do not arise just rational idea but also thinking of organizations (Chermack, Lynham and Rouna 2001).

In conclusion, strategic planning is thinking process for future, in this process planner tries to answer some questions that will be useful for strategy formulation and implementation. Strategic planning can be different company to company because of the business environment. Scenario planning can be good for providing solutions in uncertain environment. According to Van Der Heijden (1997), there are three schools on strategy and its planning process. Rationalistic suggest a analysis of environment, evolutionary school suggest ecology and finally Processural School suggest living organisations.

2.4 Scenario planning

Uncertainty is becoming more important factor for business decision makers (Chermack, Lynhma and Ruona, 2001). There are so many methods in order to cope with future uncertainties; one of the well known schools is strategic planning which tries to understand organisation itself and business environment. Another school is scenario planning that is a tool of strategic management. It is systematic approach to cope with uncertainty in strategic management process, especially in strategic planning area. (Chermack et al 2001) In scenario planning, practitioners try to generate multiple scenarios which will provide plausible futures rather then predict one exact future situation.

2.4.1 History of scenario planning

Although there are a number of different theories and practical examples of scenario planning, according to Bradfield, Wright, Cairns and Van Der Heijden, (2005) “the application of scenario planning to the business environment is a relatively new phenomenon”.

First scenario planning studies was conducted by Herman Kahn, who tried to

explain possibilities in the future, at the RAND Corporation in the 1950s for the U.S. Government military studies. Second scenario planning practice had been used in the 1960s by the Wharton School's, H. Ozbekahn which is an urban planning project for Paris (Yoe 2004), in the early 1970s important part of scenario planning that is the theoretical foundations of scenario forecasting by Royal Dutch Shell. (Wack, 1985a, 1985b) Success of Royal Dutch Shell encouraged other companies to apply scenario planning. Because 1970's oil crises affected stable environment, and dynamic environment idea was born. After that Scenario planning gets more popularized for overcoming with uncertainty. But scenario planning practise declined after the recession in 1980s. Ringland (1998), Godet and Roubellet (1996) speculated that planners over simplified to use of scenarios, they used story telling with scenario planning. Figure 2.5 shows various studies.

Aerospace and Telecommunications	Millett and Randles (1986)
Agriculture	Helgason T. and Wallace (1991)
Banking	Imundo (1986) Prebble and Reichel (1988)
Chemicals	Zentner (1987)
Data Processing	Schultz (1986)
Petroleum	Gross (1984) Jones (1985); Wack (1985a and b); Wright and Hill (1986)
Public Utilities	Ports (1985)

Figure 2.5 Various Scenario Planning Studies for Industries (Yoe 2004)

2.4.2 Concept of scenario planning

Nowadays business decision makers need to understand environment which is going to be more dynamic. Organisations are open system so that organisations need to adapt environment which they operate in. Matridakis, Hogarth and Gaba (2010) argued that traditional tools did not fit well to new complex environment. Although complex environment and level of uncertainty cannot be explained by forecasting, most of the

traditional method including strategic planning and organizational development, tries to use past trend analysis and forecast future possibility. Therefore, scenario planning gets more recognition from the decision makers whose company operates in dynamic environment. Scenario planning is an effective method for understand critical future uncertainties and investigating drawbacks of the organisations. (Kahane 1992 Cited in Charmack et al 2001)

There are many aspect and definition of scenario planning. “Scenario” means an outline or synopsis of a play. The word scenario is derived from the Italian word scene that comes from the Latin scaena. According to Schwartz (1998 p.6), scenarios represent alternative of future. Kahn and Wiener (1967) defined “Scenarios are narrative description of future” (Cited in Futures Group, 2004). Porter (1985) defined scenarios “an internally consistent view of what the future might turn to be – not forecast but one possible future outcome” There is big discussion on the scenarios, whether it is static or dynamic. Becker (1983) defined that scenarios are people imaging for future like picture. Although Wack (1985), Schoemaker (1991), Van Der Heijden (1996) supported dynamic view of scenarios and they stated that scenarios are the process of evolution of strategic development.

Becker (1983) identifies three purposes for scenarios: “(1) *to estimate if various policies and actions can assist* (2) *to assess how well alternate policies and strategies would perform under the conditions depicted; and* (3) *to provide a common background for various group involved in planning within an organization*”. Similarly Burt and Chermack (2008) showed that three element which are part of scenarios, “(1) *analysis of current events.* (2) *How, future world would be* (3) *description of future.*” However most of the authors agree that scenarios are not prediction or forecast and do not aim to get “right” future. (Schoemaker, 1991)

Scenario planning can be defined various way. Scenario planning is one of the most common qualitative tools of future forecasting. Chermack & Lynham (2002 p 343) defined scenario planning as “*a process of positing several informed, plausible and imagined alternative future environments in which decisions about the future may be played out, for the purpose of changing current thinking, improving decision making, enhancing human and organization learning and improving performance*”. Similarly Ringland (1998) used wider definition for scenario planning and he related it to tool of strategic planning. Moreover, Mintzberg (1990) classified scenario planning as a tool for strategic development of planning school. Scenario planning has been used for long range planning and to support decision in uncertain environment situation (Schoemaker 2002

pp47) Schoemaker (1995) stated; “*Managers who can expand their imagination to see a wider range of possible futures will be much better positioned to take advantage of the unexpected opportunities that will come along.*” Therefore, Scenario planning is the tool for expanding imagination. Furthermore, Schoemaker (1995) stated Scenario planning may help to reduce managerial myopia.”

Most of the author in that field use different names for scenario planning but mean scenario planning. Scenario based planning, scenario thinking, or scenario development, was used as the name instead of scenario planning. Schoemaker (1993) used scenario method, Van Notten et al (2003) used scenario analysis, Van der heijden (2002) used scenario based planning. O’Brien (2003) stated that scenario thinking. Ruona and Provo 1998 used integrated method for both scenarios and strategic plan known as “*Strategic Organizational Planning (SOP)*.” Scenario planning can be divided two parts. First one is “*Learning scenarios or first generation scenarios*”. (Wack 1985 Schoemaker 1993, Schwartz 1998 p.4, Gracht and Darkow 2010) Second one is “*Decision scenarios.*” Bood and Postma (1997) stated that there are two generations of scenarios. First generation of scenarios as a technique of determination and evaluation of future, on the other hand, Second generation lets managers to think about environmental uncertainties.

According to Lineman and Klein (1979); and Schoemaker (1993) Future is too uncertain in order to cover just one scenario, and it is essential that build up multiple scenarios for the future. According to Kenter (1998) basic assumption of scenarios planning is that future is unpredictable. Scenario planning creates scenarios that are not predicting future, help to understand different future possibilities. O’Brien (2003) categorized scenario planning as a soft problem structuring method. According to Schoemaker (1997) scenario planning allows more macro environment variable to use, than computer simulation programs, because it is difficult to reflect environmental variables in quantitative data. O’Brien (2004) stated that scenario planning as a qualitative approach which does not mention traditional hard methods such as linear programming. Moreover, these methods include system dynamics, risk analysis, visioning, performance measurement approaches, cognitive mapping and strategy formulating and evaluation methods.

In conclusion, scenarios are related to future, there is a big discussion on scenarios whether static or dynamic. Scenario planning is process of positioning plausible scenarios. In the literature, there are different names for scenario planning such as scenario thinking, scenario based planning. Scenario planning includes two sides, first scenario development

and then strategy development. O'brien (2003) stated that scenario planning is a soft problem structuring method and qualitative approach. Schoemaker (1997) stated that scenario planning allows more subjective element and macro environment variable than computer simulation programs. Also these methods include system dynamics and risk analysis. Scenario planning is a managerial tool of strategic thinking (Bood and Postma 1998).

2.4.3 Theory, Models and Methodology of scenario planning

Although there is variety of scenario planning methodologies and methods, there are not identical models. However, nearly all models have common key features. Authors support multiple scenarios and group working. O'brien (2004) divides all these approach in two dimensions, *qualitative and quantitative*. Wack (1985), Millet (1988), Schoemaker (1991), Bunn and Salo (1993), Van Der Heijden (1996), Ringland (1998), Wollenberg et al (1999), Chermack et al (2001) consider scenario planning is qualitative approach. Powell and Coyle (1997) Amara and Lipinski (1983) and Huss and Honton (1987) used possibilities in scenario planning. (Cited in O'Brien 2004, Cited in Lekeas 1999) Huss and Honton (1987) described "*scenario-driven planning as a hybrid of many disciplines which, encouraged planners and managers to think more broadly about the future.*" Scenario-driven planning categorised three major categories: intuitive logics, trend-impact analysis and cross-impact analysis. (Bradfield et al 2005)

Many authors in this field mention that theory is important in the application of scenario planning (Wack 1985, Schwartz 1991, van der Heijden 1997, Ringland 1998; 2002) According to Chermack et al (2001), Ringland, (1998; 2002), Schwartz, (1991), Van Der Heijden, (1997), Chermack 2004 and Wack, (1985), learning theory, cognitive development theory, decision theory, system theory and performance improvement theory are more useful theories for explaining scenario planning.

Authors	Approach name	Stages
Linneman and Kennell's (1977)	Shirt sleeve approach	5 stages
O'brien (2005)	8 step approach	8 stages
Tapinos (2009)	8 step approach	8 stages
Schoemaker (1995)	10 step approach	10 stages

Table 2.1 Methods for Scenario Planning.

There are quite models and methods to apply scenario planning. But there is relationship between each other. O'Brien's (2004) the eight steps approach depends on Linneman and Kennell's (1977) "shirt-sleeve approach" that was popular in 1980s and including 5 steps. O'Brien improved process and add generating uncertainty factor. Both of these two approaches are qualitative. O'Brien's approach focused on robust strategy. However, Schoemaker (1995) used ten stages model. He generally focused on internal consistency and decision making. Nevertheless, Schoemaker (1995) stated that Scenario planning should use prediction.

O'Brien's (2004) eight steps approach arises from his study about early scenario planning approaches. He determined five main pitfalls. *"(1) Early studies are focused economic rather than other factors (2) some of the early stages had chosen unimaginative themes. (3) Studies generally focused on current rather than future situation. (4) Most of scenarios were affected by the participants past experience. (5) Finally the early approaches and studies gave less attention to presentation."* (O'Brien, 1995) After these findings he came with eight stages. *"(1) Set the scene, (2) Generate uncertain and predetermined factors, (3) Reduce factor and cluster it (4) choose themes and give detail information for scenarios (5) Check internal consistency of scenarios (6) present scenarios (7) evaluate impact of scenarios (8) Develop and test strategies."* Tapinos (2009) follow O'Brien methodology but there are some noteworthy differences. In his first stage, Tapinos stated that not just setting the scene but also give importance of understanding internal and industrial environment. In the second stage, Tapinos and O'Brien both agree to define uncertainty factors. O'Brien and Tapinos are different from Burt and Chermack (2006), Wright et al (2007), Brandfield et al (2005) and Van Der Heijden (2006) who support to idea of using macro environment for creating and considering uncertainties. In the third stage O'Brien and Tapinos, approach are similar both of them support the reducing factor to understand most important factor. In the fourth stage, Tapinos supports development of scenario details. Tapinos (2009) mentioned that, scenario planning needs to create three scenarios which are not highly correlated between each other. O'Brien and Tapinos support the same methodology, testing consistency and then presentation of scenarios. Tapinos outlined first six stages were described as "the process of scenario development" the other two were described "the process of strategy development". In the seventh and eight stage, Tapinos suggested that using FAS (Feasibility, Acceptability and Suitability) framework and TOWS matrix. According to Wright et al (2008) and Tapinos (2009), using TOWS matrix strongly helps to generating

and evaluating strategy and selecting options. Both O'Brien (2004) and Tapinos (2009) approaches are part of 'intuitive-logic models' school, defined by Branfield et al., (2005) which considers scenario planning as a strategy making exercise. Most of the authors Wack, 1985; Schoemaker, 1995; Schwartz, 1996; Van de Heijen, 1996 Wright et al 2007 are also part of this school.

Based on existing literature, we can identify different schools of thought in scenario planning, important representatives of these different schools are, the Global Business Network (Schwartz, 1998), the Stanford Research Institute (Ralston and Wilson, 2006), the Wharton Business School (Schoemaker, 1991; Schoemaker and Mavaddat, 2002). French school, Future groups, Industry studies, Soft creative methods approach, SRI and procedural scenarios".

Global Business Network was born with Shell study, Schwartz left Shell and he formed the Global Business Network (GBN) with Jay Ogilvy. Schwartz (1996) offers a scenario building process in his the art of the long view book In this approach, Schwartz suggested eight stages. First stage of model is identifying focal issue based on external environment. Second stage focuses on more local environment. After the forces from environment, third stage includes brainstorming to select factors in macro environment. Step four is ranking the factors. After the ranking, step five is development of scenario logic. Step six is designing scenarios. Step seven is the implication of developed scenario and step eight is finding "leading indicators" that imply actual events.

SRI methods arose from SRI consultancy that was also founded after shell success. SRI has 6 stages, (Figure 2.6) First step is the identifying strategic decision, and second stage is key decision factors. Third stage of the method suggests that focusing environment. Stage four is focusing "scenario logic" likewise, GBN model, O'Brien (2005) and Tapinos (2009) model. Scenarios are developed in stage five. Last stage is implication and implementations. Although GBN and SRI depend on qualitative method, French school makes use of certain computer-based tools, like MIMAC- this stands for the French words "Matrice d' Impacts Croises Multiplication à un Classemen" (Matrix of cross impacts in a Multiplication ranking). French school was founded by Michel Godet who is French strategy specialist, was involved in scenario planning projects when being in charge of the Department of Future Studies with SEMA group (Ringland, 1998); This approach includes three stages first stage Build the database second Analyse possibilities and the last one reduce uncertainty for developed the scenarios.

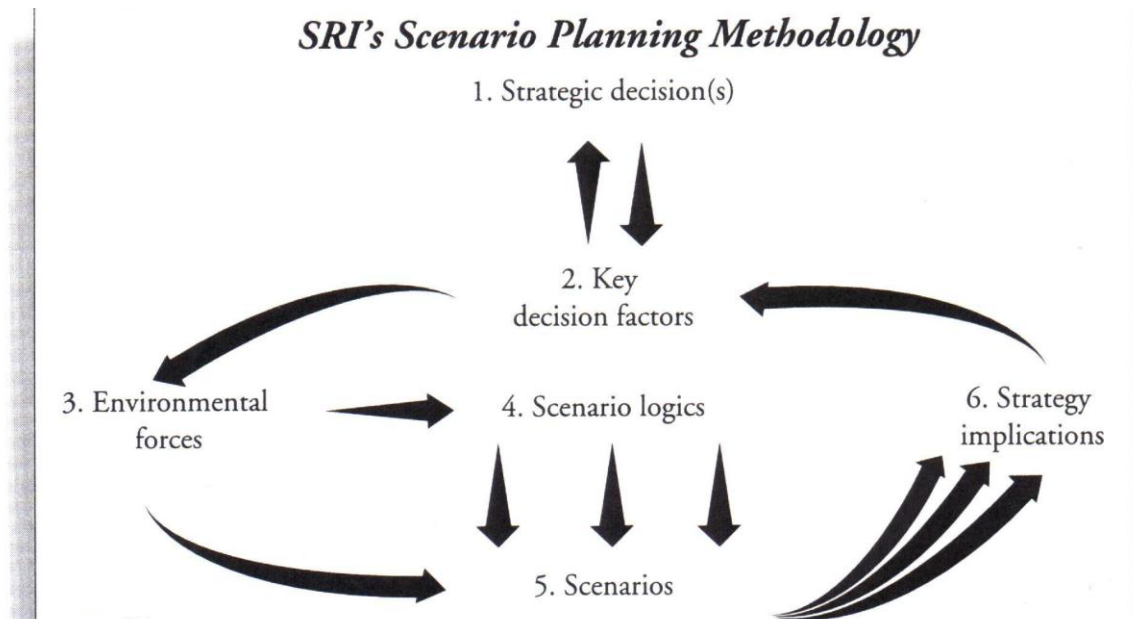


Figure 2.6 SRI Methods (Lekas, 1999)

Future group is consulting firm, which offer trend impact analysis based scenarios to the customer. Future group methodology includes three phase, first phase is preparation that tries to define focus issue and driving forces. Development phase involves scenario construction and selecting alternative world. The last phase reporting is about summary and plausible future. (Yoe, 2004) Porter (1985) mentioned scenario in industrial studies. In this approach for scenarios can help to company in particular industry for particular business aspects. Soft creative methods approach used three stages analysis, description of future and synthesis. Similarly French school, Procedural school also depends on computer driven system. Procedural scenarios based on macro environmental analysis and we can keep it in initiative and quantitative technique. (Yoe, 2004)

2.4.4 Practises of scenario planning

Scenario planning has developed mainly in practice (Wack 1985, Ringland 1998, Van der Heijden 1996). Linneman and Klein (1983) conducted a survey about how scenario-driven planning was used as a useful tool among the Fortune 1,000 companies. In 1974 just a few company used scenarios but next two years it doubled. "By 1977, 47 firms used multiple scenarios. However, scenario planning usage is different form industry to industry. According to this survey, most of the participants were related to the aerospace and process industries The best known companies that used scenario planning is, RAND, Royal Dutch Shell, Motorola, British Airways, UPS, AT&T, 3M, Siemens and general electric.(Yoe, 2004)

General Electric (GE) used a scenario construction approach based on a Delphi

expert panel and both trend-impact and cross-impact analyses. Regarding this technique, GE developed a range of probable future scenarios. GE used six stages approach, in its first two stages nearly the same other methods. In first stage, GE used some preparation for background of scenario by using environment analysis. In the second stage, GE approach focuses on selecting critical indicators. Name of third stage is Establish past behaviour for each indicator. In that period, GE used Delphi technique. In the fourth stage, they tried to verify potential future events. And fifth stage is again forecasting each indicator. Finally after all of these five stages, scenarios were ready to documentation. (Yoe 2004)

For advantage of scenario planning, it can help company or organisation to improve the ability of an organisation to get ahead of the curve. According to Ringland (1998) scenario planning has helped to:

- Pacific Gas and Electric to prepare for the earthquake in California;
- Shell to anticipate the fall of communism in Russia and its effect on natural gas prices;
- Erste Allgemeine Versicherung, the Austrian insurance company, anticipated the fall of the Berlin Wall and entered new markets in central Europe.
- KRONE, the wiring and cable supplier, developed 200 new product ideas.
- Unilever decided on marketing strategies for Russia and Poland.
- United Distillers (now Diageo) set market strategies for India, South Africa and Turkey.
- Electrolux spotted new consumer markets.

Varum and Melo (2010) have recently published overview of patterns in the scenario planning literature in the last decades. According to Varum and Melo's (2010) bibliometric study, most of scenario planning studies focus on individual company (36%) and second most common publications concentrate on territory (nearly 9%). The most outstanding result of Varum and Melo article (2010) was 70% of scenario article published after 2000, which supports that Brandfield et al (2005) assumption which is "*the application of scenario planning to the business environment is a relatively new phenomenon.*"

According to this research several of articles concentrate on strategic decision making (37%) change management (15%) technology and economies, government and policies (13%) On the other hand just 6.5 % of article focus on supply chain management and logistic and one third of these article used methodological research method.

2.5 Scenario planning in supply chain management

Logistics is defined as the activity of organizing the movement, equipment, and accommodation of troops. (Oxford dictionary) The birth of Logistics is in ancient war times of Greek and Roman empires. Military used 'Logistikas' as a meaning of supply and distribution of military resources. After 1900s logistic and supply chain management (SCM) depend on “physical distribution management”. During the Second World War (1939-1945), logistics evolved and gain importance.

After world War Two logistic become more business based activity. In literature Kent and Flint (1997) divided logistic and supply chain evolution six stages. However Papadopoulou and Macbeth (1998) divided 5 different stages. (Table 2.2)

Phase period	Phase name for Papadapoulou 1998	Phase name for Kent and flint (1997)	Characteristic
Early 1900's - Late 1950	Introductory Period	Frm to market	Single Services
Late 1950's – Mid 1960	Awarness Period	Segmented functions	Sepparate services
Mid 1960's – Late 1970	Necessity Period	Integrated functions	Integrated services
Late 1970's – Late 1980	Integration Period	Customer focus	Combined services Customer idea
Late 1980's - Late 1990	Differentiation Period	Logistics as a differentiator, and Behavior and boundary spanning.	Differentied area for company Complex combined services

Table 2.2 Papadapoulou (1998) and Kent and flint (1997) evolution model on Logistics.

Logistic was affected by mainly two drivers' military and business. Until 1950 military technology and improvements changed the shape of logistic. 1950 to 2000 logistic pattern was affected by customer needs. After 2000's sector focused on not just transportation but also managing the network due to the globalisation.

The future of the supply chain management and logistic sector will be affected by many threats and opportunities due to uncertain future environment (Gracht and Darkow 2010). Logistics service providers face very tough market situation that is different from the situation in the past. Effects of globalization increased and then supply chains have become longer and more complex. Scenario planning is one of the most common qualitative tools for foreseen future. Since logistics management is known as strategic issue long-term based planning has become more common in logistic industry. (Singh, 2004, p.3 Cited in Gracht and Darkow, 2010) Recently increasing number of researchers has focused on scenario planning for long term strategy development in logistic industry. Recent research emphasized outsourcing of logistic services, competition and differentiation (Gracht and Darkow 2010) Grant et al (2006) and Waters (2007)(Cited in Gracht and Darkow) stated that "*companies will go on to focus on their core competencies*" It leads companies to outsourcing their logistics activity.

In these decade, most of research about scenario planning in supply chain management and logistic sector focus on application or both methodology and application. (Gracht and Darkow 2010) According to Gracht and Darkow (2010), delphi method was used by most of researcher in logistic aspect Governments and associations used scenario planning as well. In these decade European community and institute for mobility research conducted research about scenario planning (European community 2004; Institute for mobility research 2002) to future mobility.

Logistic industry literature can be divided into three subgroups. Literature focused on until 1990's transportation, 1990 to 2000 regional logistic, after 2000 design technology and future of logistics. Until 1990's papers focused on transportation, road design and traffic design. Delphi method was very common in researches. (Gracht and Darkow 2010) Between 1990 and 2000 researches were more focus on logistic system and regional logistics. Such as Cooper (1994) conducted research in future logistics in Europe by using Delphi techniques. Lync et al (1994) conducted research for forecasting Canadian logistics. On the other hand Bradley (1997) focus on global logistic. (Cited in Gracht and Darkow 2010) However, Perry (1991) and Perry (1996) focused on design of the logistics. After 2000 researchers focused on more future picture and tried to find best solutions for future

needs. Boasson (2004) in his master thesis, researched to best supply chain design for future by scenario planning, Duin Et al (2005) focused on future of RFID, Singh (2004) also tried to foresee future supply chain management. Moreover Sodhi (2003) combined strategic supply chain planning and scenario planning. On the other hand Stead and Banister (2003) tried to find logical scenarios for policy of mobility, and European mobility (2004) also focused mobility policy. After 2000 there were some company researches, Gausemeier et al (2001) conduct research on Deutsche Bahn internal scenarios about courier. Garvin and Levesque (2006) published Harvard case about strategic/scenario planning in UPS. Nevertheless Siemens conducted research on first picture of logistics then picture of the life. (Cited in Gracht and Darkow

Gracht (2006) define the following six segments of logistics service providers:

- Carrier
- Freight forwarders
- Third-party logistics providers (3PL)
- Fourth-party logistics providers (4PL)
- SCM-IT-service-providers
- Logistics consultants

Scenario literature about logistics generally focused on main design and future picture of the sector just handful of them used carrier or freight forwarder. But literature has not enough papers on 3PL and 4PL. This paper aims to fulfil this gap.

In conclusion, Chermack & Lynham (2002) defined scenario planning as *"a process of positing several informed, plausible and imagined alternative future environments which improving decision making, enhancing human and organization learning and improving performance"* and it is part of strategy development, according to AIM research it is one of the most common strategy tools. Scenario planning can help strategy formulating. In the scenario planning literature, there are so many school but we can divide intuitive, cross impact and trend impact analysis. In logistic scenario planning was started to be common after the importance of logistic and its design, we can divide three subgroups, until 1990 transportation based scenarios, 1990 to 2000 regional logistic based scenarios, 2000 to now, future of logistic, scenarios for best SCM designs. However, literature about scenario planning in logistic and supply chain management is lack of company based studies.

Chapter 3 Research Methodology

3.1. Introduction

Uncertainty is the one of the major issue in order to think before taking a decision. There are so many different models that are trying to cope with uncertainty. Scenario planning is one of the tools which try it to do so. Scenario planning has been used for long range planning and support decision in uncertain environment situation. (Schoemaker 2002 pp 47) Recently, an increasing number of authors focused on scenario planning in logistic and supply chain industry, especially environmental issues. The development of scenarios will help to create a better understanding of the logistics environment, and also a better understanding of the company which were studied. (Tapinos, 2009) This paper used scenario planning to determine what is predictable and what is uncertain. This chapter explains research methodology, research design, data sources and analysis. This chapter also answers why this methodology was chosen and why this designed was applied.

3.2 Methodology to be employed

Research methodology is crucial to write academic papers and find answer of research question (Creswell, 1994). The aim of this paper is to develop scenarios to answer “Which strategies will DB Schenker AG have to focus on for 2030 to keep and increase their customer confidence and shareholder value in an uncertain future environment?” by scenario planning. This paper provides company practice, long term effect and potential future strategies. In order to answer research question and give importance to its sector, this paper edited Tapinos (2009) methodology which includes 8 stages however in order to give importance on competitors, this paper add two more stages and create new ten stages model.

Step 1) Setting the scene (analysis of company position): This paper used same stage which was suggested by Tapinos (2009). However, analysis was edited. Tapinos (2009) and O’Brien (2004) suggested that, “develop in depth” understanding into the company by using micro environments analysis and internal environments analysis. Wack (1985) suggested that understanding of industry drivers is required. They suggested starting with Porter’s five forces (Porter, 1980). However, analysis of the macro industry is crucial to understand logistics industry and set the scene, Logistic industry depend its history. Therefore, looking past trends and cyclical cycles helps to understand uncertainty. Therefore, this paper started cyclical period analysis, then emphasized to micro analysis by using first strategic group analysis in order to see companies rival and its position in its

industry. In my opinion, Strategic group analysis is crucial for scenario planning to see position of company and main rivals. Then edited version of Porter five forces (edited by Wheelen and Hunge 2003), which includes other stakeholders in order to see institutional pressure over the company was applied. After the industry analysis, paper focuses on company's main activities (Tapinos, 2009), "Resources and competencies-based planning" (Dyson, 2004; Tapinos 2009) In order to see main activity, resources and competences, competitive situation and special assets, "Resource Based View" (Peteraf 1993; Barney, 1991) was applied, After the resources analysis competences tree (Prahalad and Hamel 1990) was applied to see main competences.

Step 2) Analysis of main competitor and stakeholders: According to Van Der Heijden (1996) competitive positioning is key question in strategic decision. In logistics industry, increasing competitions, and institutional pressures are the key decision driver for companies (Datamonitor 2008). Therefore, making competition based analysis and stakeholder analysis are crucial for this kind of sector research. For stakeholder analysis, this paper used Stakeholder Attributes (Mitchell,Agle & Wood, 1997) for competition analysis this paper combined Van der heijden (1996) six step approach and porter competitor's analysis (1980 p49)

Van der Heijden suggested following approach;

- Identifying customers we are competing for
- Testing business definition
- Identifying the competitors
- Competitive cost driver analysis
- Competitor response profiles
- Summarising the most important customers. (Heijden,1996)

Porter (1980) suggested that competitor analysis must become more vital part of strategic planning. This analysis has four key aspects for competitors. These are "Objectives, assumptions, strategy and capability". In my paper, I start with defining customers, then defining competitors by using strategic group analysis, then defining their "competences, capabilities, current strategies and future strategies".

Step 3) Generation of uncertain and predetermined factors: In this stage my paper followed Tapinos (2009) and O'brien (2004) methodologies, Uncertainties and predetermined factors were generated by micro and macro environmental analysis. **Step 4)**

Identifying factor ranges: Tapinos (2009) suggested reduction of factor from 40 to 12 and choose the most important and uncertain ones. My paper followed his suggestions. And reduce uncertainties. **Step 5) Scenario theme:** Tapinos (2009) suggested that after the analysis and identifying the uncertainties, determine the themes of scenarios and give detail of it. **Step 6) Checking internal consistency:** Scenarios must be internally consistent; In order to check consistency this paper used cross impact analysis. **Step 7) Presenting scenarios:** After the internal and external consistency, the next stage involved presenting scenarios. **Step 8) Assessing impact of scenarios:** For assessing scenarios, Tapinos suggested TWOS matrix, this paper applied TWOS matrix and at the same time in order to generate strategies. **Step 9) Generating and testing strategies:** In order to test strategy FAS framework was applied in this paper. **Step 10) Picturing competitor position and competences in scenarios:** This part added to Tapinos (2009) approaches to see main competitors position in particular scenarios and competitors response to Schenker's potential strategies.

3.3 Research design

According to Berg (2004, p. 19-20) there are six basic stage in the research approach. They are idea, literature review, research design, data collection & organization, analysis and findings and dissemination Research project quality depends on understanding of research design. Research design helps conceptual framework and create process to reach result. (Yin 2004) we can divide research design two main subgroups first is quantitative the other is qualitative. Quantitative research is confirmatory on the other hand, qualitative is mostly exploratory. (Yin 2004) Quantitative research's collection methods are experimental, causal-comparative, correlation, and survey research. Qualitative research's methods are case study, focus group, and historical research perspectives. Qualitative method is more applicable environmental analysis rather than quantitative method. (Berg, 2004)

The aim of this paper is providing theory of scenario planning and plausible future for "DB Schenker AG" (Schenker) we can use different methods to understand the future, but scenarios are most proper one. (Wack 1985a) Both quantitative and qualitative research can be used for scenarios. Companies can generate alternative strategies based on scenarios. In order to provide theory and scenarios this paper has chosen one of the qualitative research method case studies. Case study is the most proper approach to analyse and understand company. (Yin, 2004)

3.4 Case study

According to Yin (2004) case study tries to answer question of why and how. Moreover, “*main aim is investigating individual person, group, institution, organisation, program, event, process, or phenomenon by using proper data sets.*” (Creswell, 1994, p. 12) Case studies are used in business, medicine and law. In order to collect data for case study, fieldwork is the best proper one however secondary data collection is usually used by researchers. According to Yin (2003) a case study design should be considered when: “(a) the aim of the study is to answer “how” and “why” questions; (b) can not manipulate the behaviour of those involved in the study; (c) people want to cover contextual conditions because its relevant to the phenomenon (d) the boundaries are not clear between the phenomenon and context.” Moreover Yin (2004) tried to explain three types of case study research. “*Exploratory, descriptive and explanatory*” first one “exploratory” researcher’s focuses on more testable hypothesis. For descriptive case study helps to describe phenomenon. And finally explanatory case studies help to find explanations.

The main disadvantages of case studies are complexity, case studies need large amounts of data for analysis in order to reach reliable result, therefore, multiple sources needed to use. Moreover, it can not be acceptable if it is done poorly. According to Flyvbjerg, there are big five misunderstandings about case studies. A first misunderstanding is, people believe general theoretical knowledge is more reliable; second one is case study can not contribute science. Third one is case studies just good at creating hypothesis not for testing them. The fourth one is, case study methods contain more bias regarding to researchers aim. The fifth one is often difficult to summarize it. (Seale, Gobo, Gubrium and Silvermen, 2004) The advantages of the case study method are its applicability to real situation, easy access to data and result of the case study is related to real life. (Yin, 2003)

In order to provide depth understanding of scenario planning theory and analyse of Schenker, this paper focuses on *exploratory and descriptive case study*.

3.5 Data collection

Secondary data was used for making analysis for exploratory and descriptive case study in this paper. Secondary data tries to put theory on practise by using appropriate data.(Randolph, 2009) In this paper, research mainly was based on qualitative methods. For qualitative method, secondary data can be useful. (Randolph, 2009) External secondary data includes all data which has already existed and collected outside of the organization

by other researchers. These kinds of data can be provided by internet, library and market reports. (Hox and Boeije, 2005) However it causes finding vague data. There are different classifications for secondary data such as “*encompassing secondary data, raw secondary data, compiled secondary data, documentary secondary data, survey based secondary data, and secondary data compiled from multiple sources.*” (Sobal, 1982) Three major categories of secondary data as follows: “*documentary secondary data multiple source secondary data survey secondary data*”. This paper used documentary and multiple sources of secondary data which can come from newspaper article, research report, business journals, literature about logistics and companies, governments report, public information, public statistics, Datamonitor, Euromonitor, Keynotes and other specific industry reports, company special reports which were written by PwC, AT Kearney and other consultancy firms, industry magazines, company websites and publications, electronic resources such as Orbis, Jstor, SAGE, Science direct and wiley online library. This paper is also looking for company based research therefore; secondary company data is one of the most proper resources for this paper.

3.6 Data Analysis

According to Miles and Huberman, (1984) (Cited in Tellis, 1997), after the data collection and finding, there are three different stages, first data display; second data reduction; third one is conclusion by verifying the data. This paper focuses on this structure by using secondary data and qualitative research which is case study. After finding and interpret the appropriate data, data will be reduced and analysed by Tapinos (2009) scenario approach. Main aim of this paper is generate strategy in order to apply plausible future scenarios for DB Schenker AG in global perspective. Therefore, data analysed for generating strategy.

Chapter 4 Case study Analysis research and findings

4.1 Overview of DB Schenker AG

Schenker & Co was founded by Gottfried Schenker in Vienna Austria in 1872. In 1991, Schenker was acquired by Stinnes AG. In 2003, Deutsche Bahn announced acquisition of Stinnes for DM 2.5 billion (\$2.45 billion) (Fundinguniverse, 2011) and then Stinnes became a wholly owned subsidiary of the Deutsche Bahn (DB) which is German railway company that divided into four main operations: **Arriva, DB Bahn, DB Netze and DB Schenker**. DB' turnover was 34,410 million Euros in 2010. (Deutsche Bahn AG, 2011)

Under the umbrella of Deutsche Bahn, DB Schenker combines two units DB Schenker Rail and DB Schenker Logistics, Main operations areas are *rail, land transportation, air and ocean freight, contract logistics/SCM, sports and events logistics, reverse logistic, oil and gas transportation, global project and special solution for various industries*. (DB Schenker AG, 2011) DB Schenker generated total revenues of approximately 18.9 billion euro around 2,000 locations in 130 countries around the world in 2010. (DB Schenker AG, 2011) The logistics division of DB is the world's second largest transportation and logistics service provider based on sales and performance. (Panalpina,2009).

DB Schenker Rail		DB Schenker Logistic	
Revenues (billion €)	4.584	Revenues (billion €)	14.310
EBIT (million €)	12	EBIT (million €)	304
Employees	32,618	Employees	58,671
Freight carried (million t)	415.4	Shipment in European land transport (in thousand)	80,816
Transport performance (million tkm)	105,794	Air freight volume (thousand t)	1,225
Load in t per train	502.4	Ocean freight volume (thousand TEU)	1,647
Number of trains per day	5,122		
Locomotives	3,437		
Wagons	108,840		

Table 4.1 Financial information for year 2010 (DB Schenker, 2011)

4.2 Scenario Planning for DB Schenker AG

In order to apply scenario planning to Schenker, This paper used ten steps method which was edited from Tapinos (2009).

Step 1) Setting the scene (analysis of company position)

Step 2) Analysis of main competitor and stakeholders

Step 3) Generation of uncertain and predetermined factors

Step 4) Identifying factor ranges

Step 5) Scenario themes

Step 6) Checking internal consistency

Step 7) Generating and testing strategies

Step 8) Assessing impact of scenarios by time horizon

Step 9) Presenting scenarios

Step 10) Picturing competitor position and competences in scenarios

4.2.1 Setting the scene (Analysis of company position)

In order to set the scene for logistic company this paper starts analysis by past based cyclical period analysis. Then focuses on micro analysis (*battlefield analysis*) by using first strategic group analysis in order to define battlefield and rival. Then edited version of Porter five forces (edited by Wheelen and Hunge, 2003) was applied. Critical success factor of sector was used. After the industry analysis, paper focused on internal analysis, by using RBV (Peteraf, 1993 and Barney, 1991) and competences tree.

4.2.1.1 Cyclical Period analysis

Nowadays, The Logistics industry took forms the backbone of global supply chains. However in the past, post companies were backbone of logistic industry. On the other hand military logistic system was corner Stone of postal system. It is obvious that logistic sector was affected by its history (PwC Transportation and Post, 2010). Therefore, giving importance on its history helps to determine uncertainties. Cyclical period analysis depends on idea of *“Everything and everyone was affected by its past”* This analysis focuses on history of sectors and general trends.

Kent and Flint (1997) and Papadopoulou and Macbeth (1998) tried to show evolution process in logistics. (Table 2.2 in Chapter 2) They just focused on after 20th

century. However even ancient age, logistics was a big issue. Logistic is shaped by mainly two drivers' military and business. Until 1950 military technology changed the shape of logistics. Satellite investment and operational research studies increased (Lekeas, 1999). After 2000's sector focused on not just transportation but also managing the network. Therefore, freight forwarders started to focus on long term contract in order to reduce supplier pressures and manage the networks. The other issue, after the GATT and WTO, firms mainly focused on being international. At the same time, efficiency pressure and competition lead to specialisation in global market. (PwC T&L 2030, 2011) Table 4.2 provides information about how sector changed. Figure 4.1 provides general structure of sector.



	Military distribution	Physical distribution	Military logistic	Business logistic	Supply Chain management
Phase Period	Ancient age to 1900's	Ancient age to 1950's	1900's to 1950's	1950's to 2000's	2000's to now
Main Drivers	Providing resources to war	Carrying goods to market	Increasing military Power efficiency	Profit orientation, FDI and MNE's	Customer, complexity, Industrial solutions Outsourcing
Political and economical situation	Kingdom and emperors New lands Military investment	Produce more and sell it in domestic market Inflation rate increasing	World war 1 and 2 Military investments	GATT and WTO Semi global world New markets	Increasing number of Freight forwarders Outsourcing Efficiency
Social and technologic drivers	Military technology	New land Increasing population Specialisation	Optimisation Operational research Military technology Satellite investment	Demographical change Technological improvement Satellite investment	Global world, new markets communication GPS RFID PDA

Table 4.2 Logistics History (PwC Transportation & Logistics (T&L) Vol 1,2,3,4 2011) (Lekeas 1999) (Deutsche Post AG, 2009) (Manatayev, 2004) (AT Kearney, 2010)

Three main drivers of business logistic and freight forwarders are; technology that arose from military research Second one is business logic that arises from past experiences and institutional pressures, third one is commoditization. (Manatayev, 2004) Outsourcing started in 1980's in US and third party logistics (3PL) companies started to be common but it was more common in 21st century (Manatayev, 2004). These cause commoditization and

differentiation in the sector. Now Companies willing to be fourth party logistics company (4PL). (Manatayev, 2004) Other problem arises from industry lifecycle, (PwC, T&L 2030 Vol 2, 2011) Therefore, growth crises are one of the main problems. According to Greiner's (1998) alliances may solve growth problem.

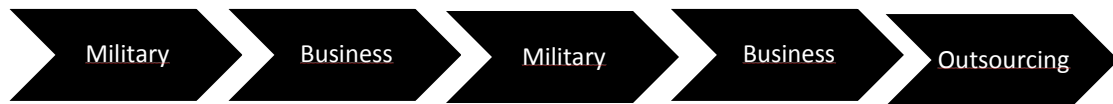


Figure 4.1 Pattern of industry (PwC T&L Vol 1,2,3,4 2011) (Lekeas 1999) (Deutsche Post AG, 2009) (Manatayev, 2004)

4.2.1.1.1 General trends in the sector

According to Panalpina investor presentation (2009) PwC T&L 2030 series (2011), AT Kearney China 2015 (2010) Deutsche Post AG, Delivering tomorrow (2009), Gracht and Darkow (2010), Kent and Flint (1997), general trends in logistics sector are;

- Internationalization/globalization/Increasing competition
- Developments in information and communication technology
- Increasing complexity in logistics
- Higher customer demands on quality and service
- Outsourcing
- R&D/ Innovation management
- Logistics management is a strategy issue nowadays.
- Complex supply chain management solutions
- Global coverage

Overall these trends, cause consolidation in logistics industry and make it more competitive (Manatayev, 2004).

4.2.1.2 Battlefield analysis

Battlefield analysis is the combination of different kind of analysis to provide micro industry analysis. It tries to reflect market place which company compete in. It includes four main steps; first defining over all market financial results and trends which help to see

big picture. (Big Picture) Second step structure of market, main rivals and groups by Strategic group analysis (Main battlefield, and rivals). Third step is representing forces in the markets by edited version of five forces analysis (Porter, 1980; Wheelen and Hunge 2003) (Market forces and pressures in real battlefield). Last step focuses on companies objectives. (Main objectives)

4.2.1.2.1 Big picture Battlefield in general

Schenker is providing Freight Forwarding service. The freight-forwarding sector acts as an intermediary between the client and the transportation market. In order to see and group activities in freight forwarding we can use BIFA (*British International Freight Association*) range of services. These are:

- European road and rail distribution
- Maritime intermodal services
- Air freight consolidation and forwarding
- Customs broking and consultancy
- Packing of goods for export
- Warehousing and distribution
- Logistics and supply-chain management. (BIFA, 2011)

And some freight forwarding companies are providing couriers and express parcel services as well. (Keynote, 2010)

Freight forwarders provide service in global logistic industry for business and final customers. \$804.6 billion revenue was generated by the global logistics market with compound annual growth rate (CAGR) of 6.2% (2003-2007). Expectation for 2012 is \$1,041 billion with CAGR 5.3% (2007-2012). (Datamonitor, 2008)

Schenker is providing 3PL service to increase speed of transportation by using knowledge and networking management. According to by Ernst & Young and the University of Tennessee research (2003), organization which is using 3PL companies, reduced their logistics costs by an average of 7.8% and reduce their order cycle time from 6.3 to 3.5 days.

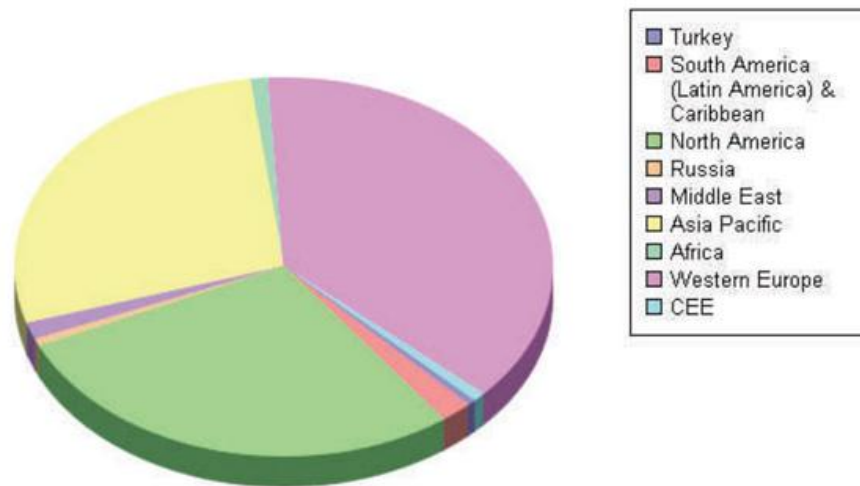


Figure 4.2 World global logistic market 2008 (Transport intelligence, 2009)

Although there is a highly competitive global market, Top 10 logistics companies recorded revenues of \$284.6 billion during 2008, which represents 5% upsurge over 2007. However operation profit and net profit decreased in 2008. Operating profit was \$15 billion during 2008; it was decreased of 0.5% compared to 2007. The net profit was \$5.7 billion in 2008, a decrease of 40.8% compared to 2007. (Datamonitor, 2009) There is a big problem in sectors to keep margin stable due to consolidation and competition these ten companies are;

- Deutsche PostDHL
- United Parcel Service, Inc.
- Deutsche Bahn AG(DB Schenker)
- FedEx Corporation
- Kuehne + Nagel International AG
- TNT N.V.
- CEVA Group
- C.H. Robinson Worldwide Inc.
- Panalpina World Transport (Holding) Ltd.
- Agility Logistics Co. (Datamonitor, 2009)

These companies are main rivals of Schenker and all of these are serving global market. Revenues' have increasing trend, however net profit and operational profit are decreasing due to increasing in operational cost and decreasing in margin.

4.2.1.2.2 Where is the main battlefield and who are main rivals in battlefield?

In order to see main battlefield first this paper tried to answer who are customers? Schenker is an intermediary between the client and the transportation market, sometimes Schenker using own transportation equipment and warehouses or sometimes outsourcing it. Main market is international B2B market. Curry’s pyramid (2000) helps to see and classify customer.

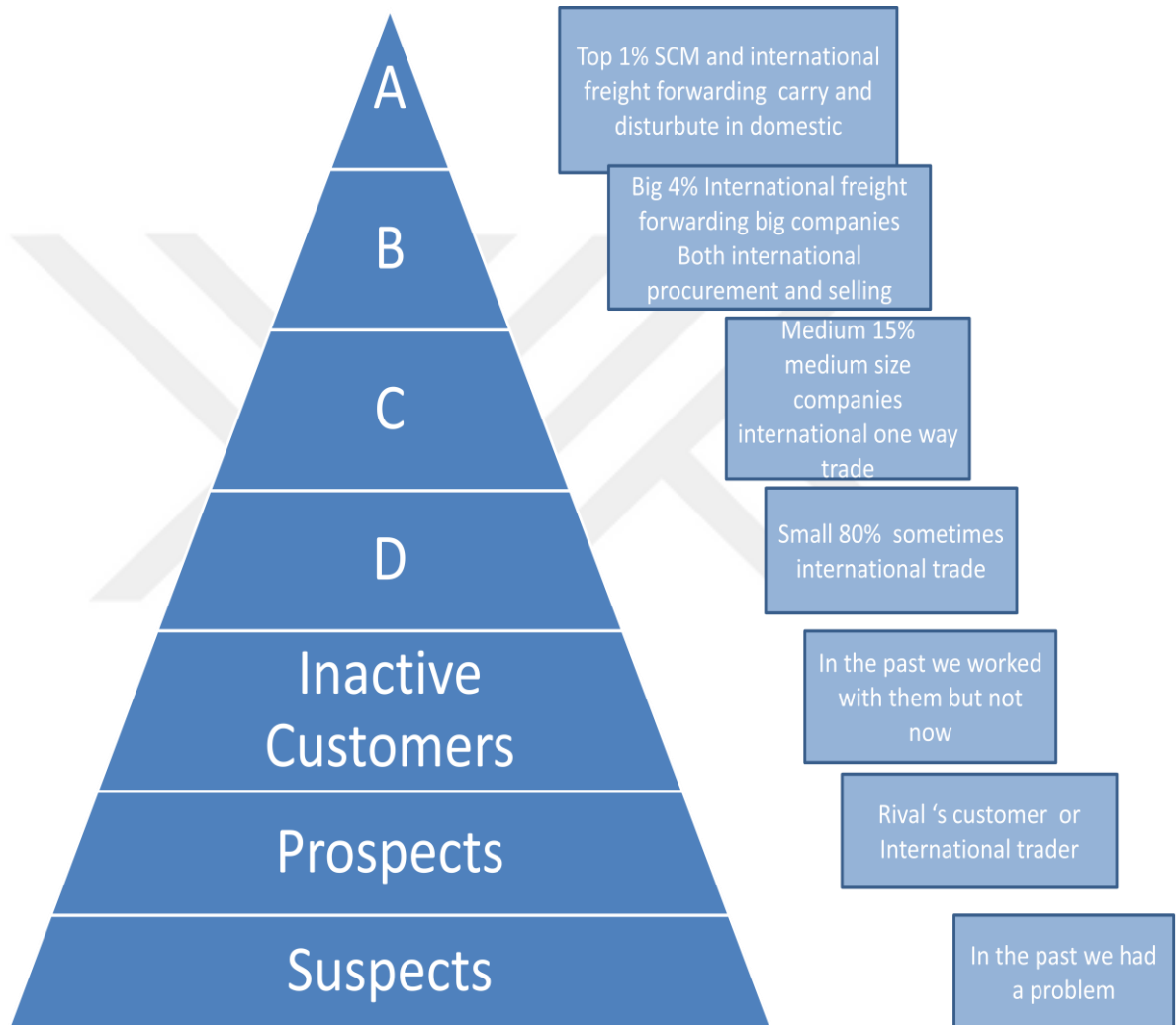


Figure 4.3 Curry’s pyramid (Curry and Curry 2000) (DB Schenker, 2011) (DB Schenker, 2008)

Customer A is dealing with international activity or/and domestic distribution such as retailing or industrial needs (Chemical companies, automakers) Customer B is generally dealing with international trade both downstream and upstream. C and D type of customers are dealing one way of international trade. Most profitable customers are A and B segments, main competition arises from these two segments. A and B segments

customers need special solution and wide range of service and special design for their supply and demand chain. Sector is looking forward to increase to portion of A and B customer the main aim is, increase contract length and providing special solutions. In order to provide special solutions CRM activities importance increased. Sector's main market is going to providing SCM and special solutions. However C and D segments customers help company to reach critical mass to fulfil transportation vehicle. (Datamonitor, 2008; Curry and Curry 2000; Datamonitor, 2009; PwC, 2011) Therefore this paper focused on A and B types of customer segments.

On the other hand, big parcel express and courier (PEC) firms such as TNT and UPS are also providing special industry solutions for Segment A customers; their business model is different from the Schenker's business model (Freight Forwarding). (TNT, 2011) (UPS, 2011) (DB, Schenker 2011) In order to see Schenker's rival in these most profitable segments two different strategic group analyses were applied. First strategic group analysis represents just freight forwarder companies, these companies using the same business model like Schenker which try to provide global SCM service. It depends on coverage, technology, experience, and service variety. Strategic group used product/service variety and network coverage as dimensions. Second strategic group analysis represents Special industry solutions in order to show differences between Freight forwarders and PEC. Chain management activity (such as Procurement & Manufacturing, fulfilment logistic, Cross docking Kit, Assembly, Light assembly, Reconfiguration, Labeling, Price tagging, Bundling and unbundling, Sequencing Technical Inspection Regulatory Compliance) (DB Schenker 2011) and business based solutions (special industry solutions) were used as a dimension. Bubbles are representing revenue. Network coverage, service, special service solutions and chain activity information were collected in company web sites. Revenue information were collected from Datamonitor (2009) and Panalpina (2009).

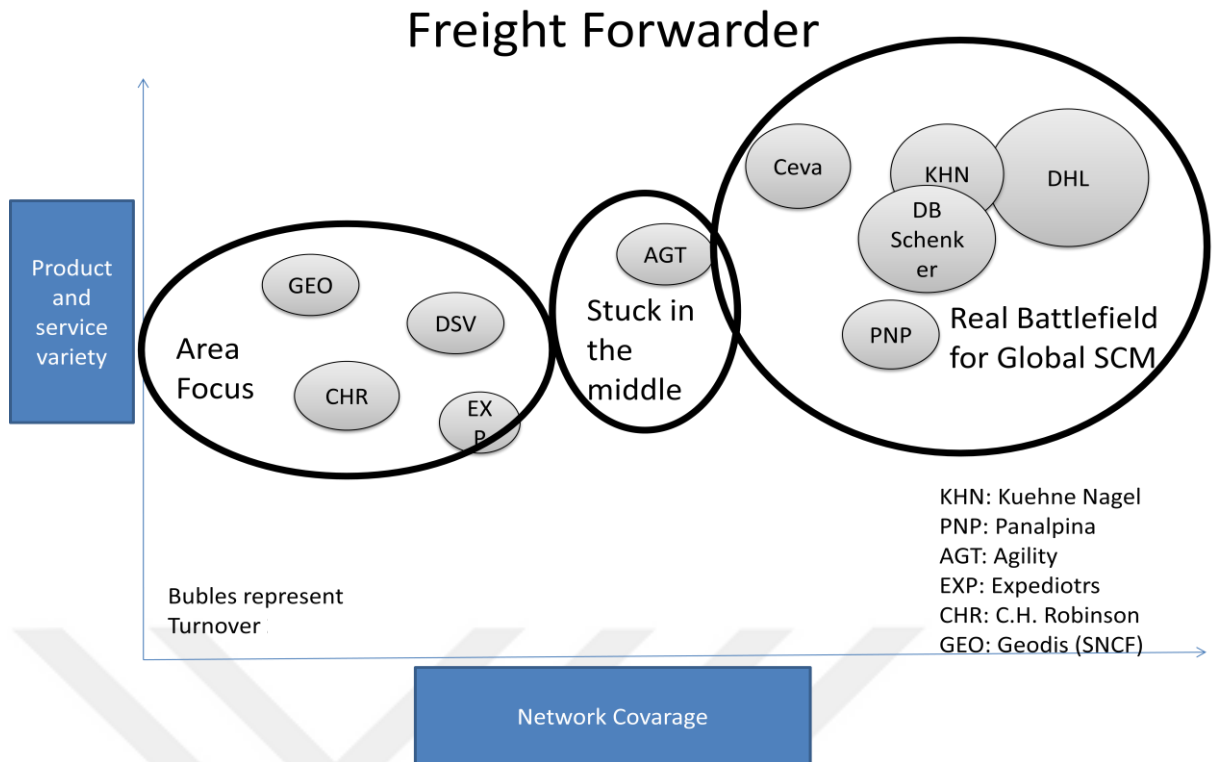


Figure 4.4 Strategic group analysis for Freight Forwarder (Panalpina Investor report 2009; Panalpina, 2011; Kuehne Nagel, 2011; Agility, 2011; Expeditors, 2011; C.H. Robinson, 2011; Geodis, 2011; DB Schenker 2011; DHL, 2011; CEVA, 2011; Datamonitor 2009)

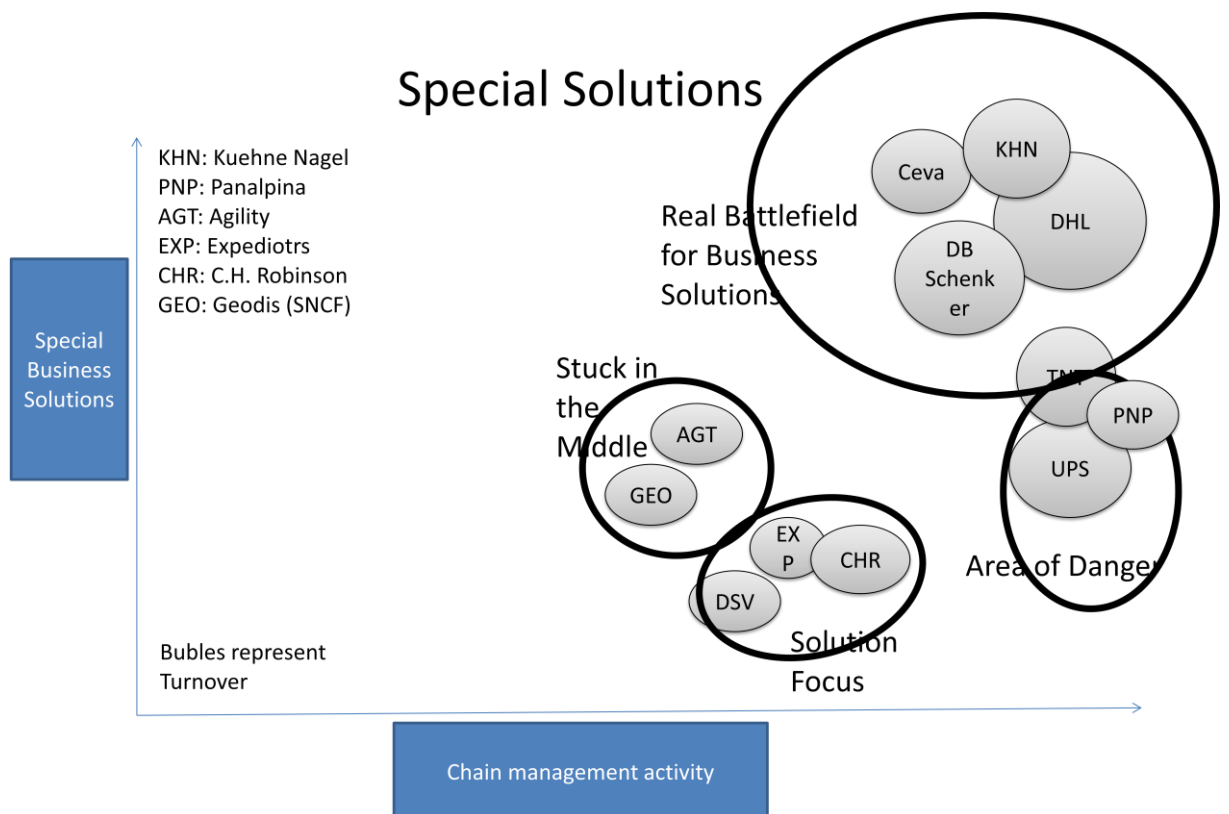


Figure 4.5 Strategic group analysis for Special Business Solutions (Panalpina Investor report 2009; Panalpina, 2011; Kuehne Nagel, 2011; Agility, 2011; Expeditors, 2011; C.H. Robinson, 2011; Geodis, 2011; DB Schenker 2011; DHL, 2011; CEVA, 2011; TNT, 2011; UPS, 2011; Datamonitor 2009)

According to two strategic group analyses Schenker’s main rivals are DHL, Kuehne Nagel and Ceva. Panalpina is a threat in freight forwarding market, Panalpina’s good international network help it to reach global SCM position in freight forwarding market. Moreover, their industry based solutions is increasing day by day according to their investment report (2009) Panalpina aims to reach real battlefield area. TNT is a threat in Business solutions market, TNT’s internal courier network help them to reach real battlefield area. This paper used CEVA, DHL and Kuehne Nagel (KN) as real rivals; TNT and Panalpina are potential rivals for future.

4.2.1.2.3 Market structure and forces in real battlefield.

Figure 4.6 shows general structure of industry. We can divide sector, freight forwarders and SCM companies, Freight forwarders just take a part in inbound and outbound logistics but SCM companies take part in all phase in value chain. Figure 4.7 shows Supply chain management value adding services. Figure 4.8 shows Industry value chain and it will help to understand structure of SCM and logistics chain.

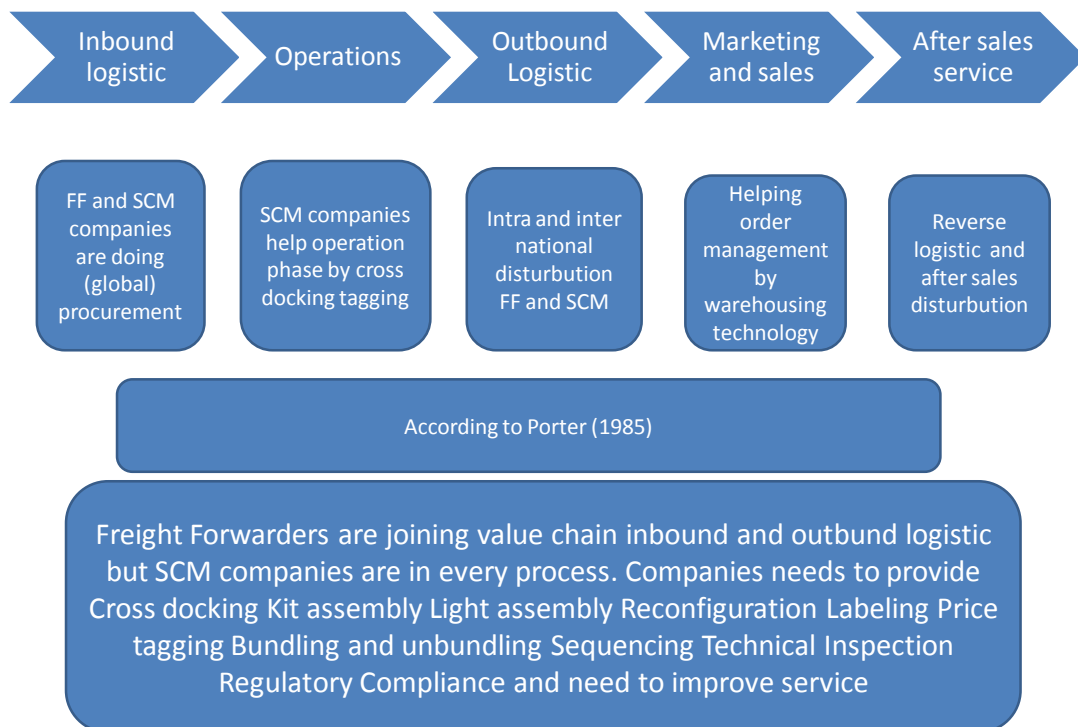


Figure 4.6 Value chain analysis (Porter, 1985; PwC T&L 2030 Vol 1 2011; DB Schenker 2011; Logistics 2009; Deutsche Post AG, Delivering tomorrow, 2009)

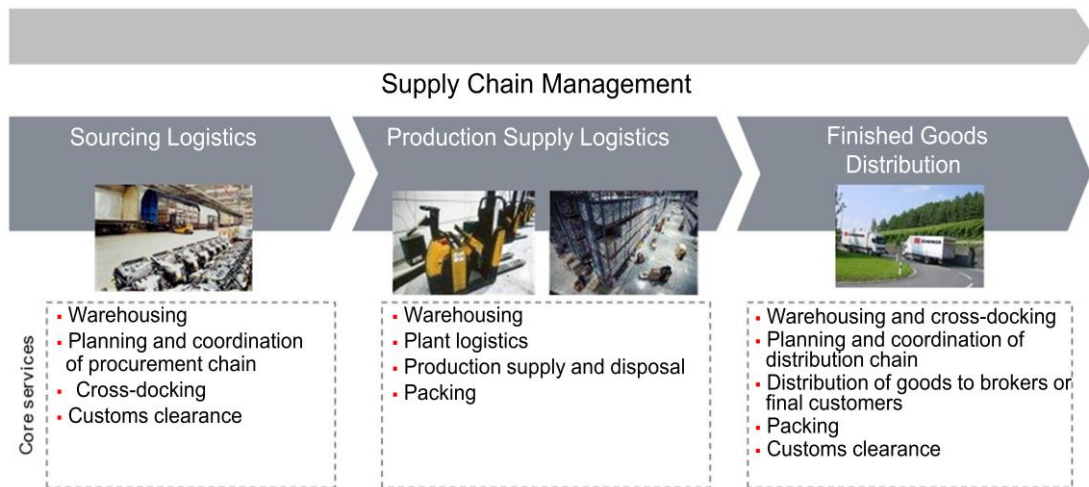


Figure 4.7 Supply Chain Management Value adding activities. DB Schenker AG, (2008)

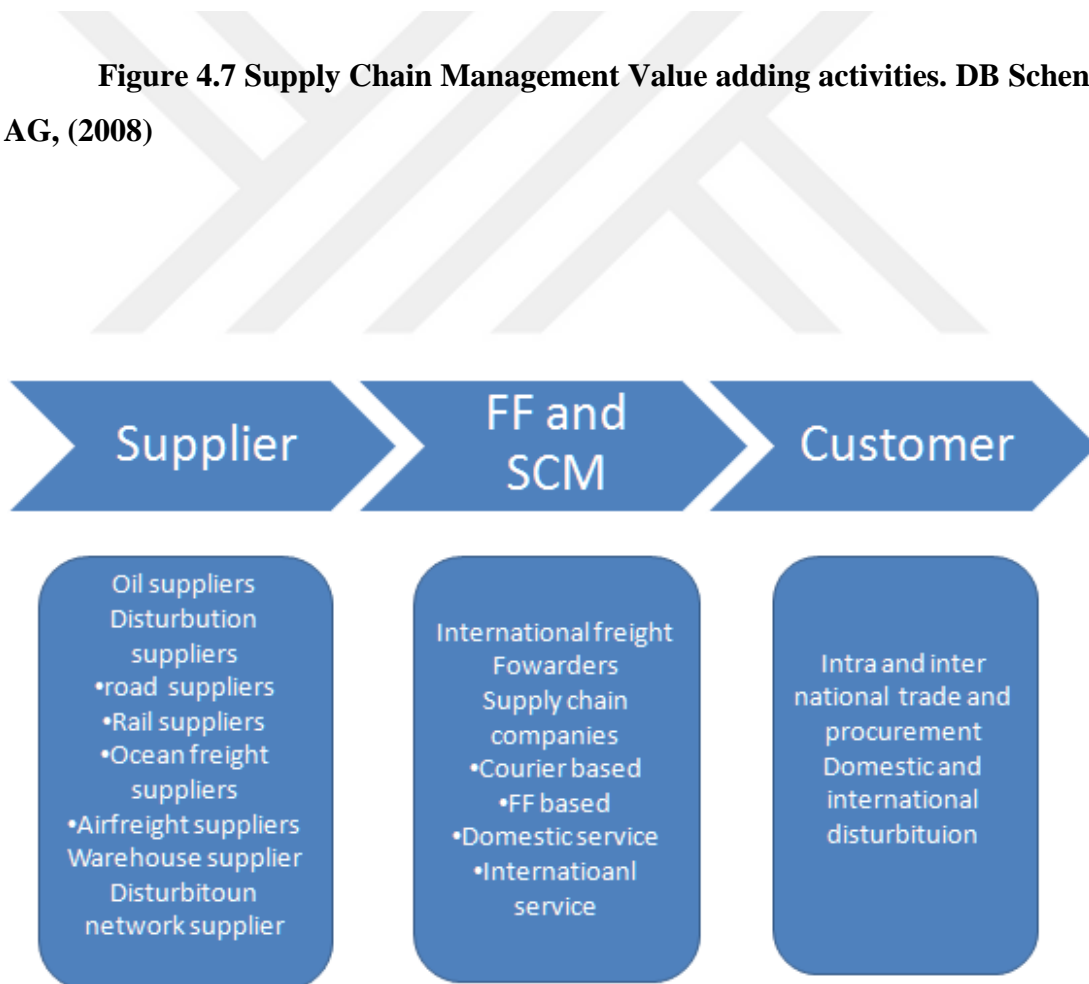
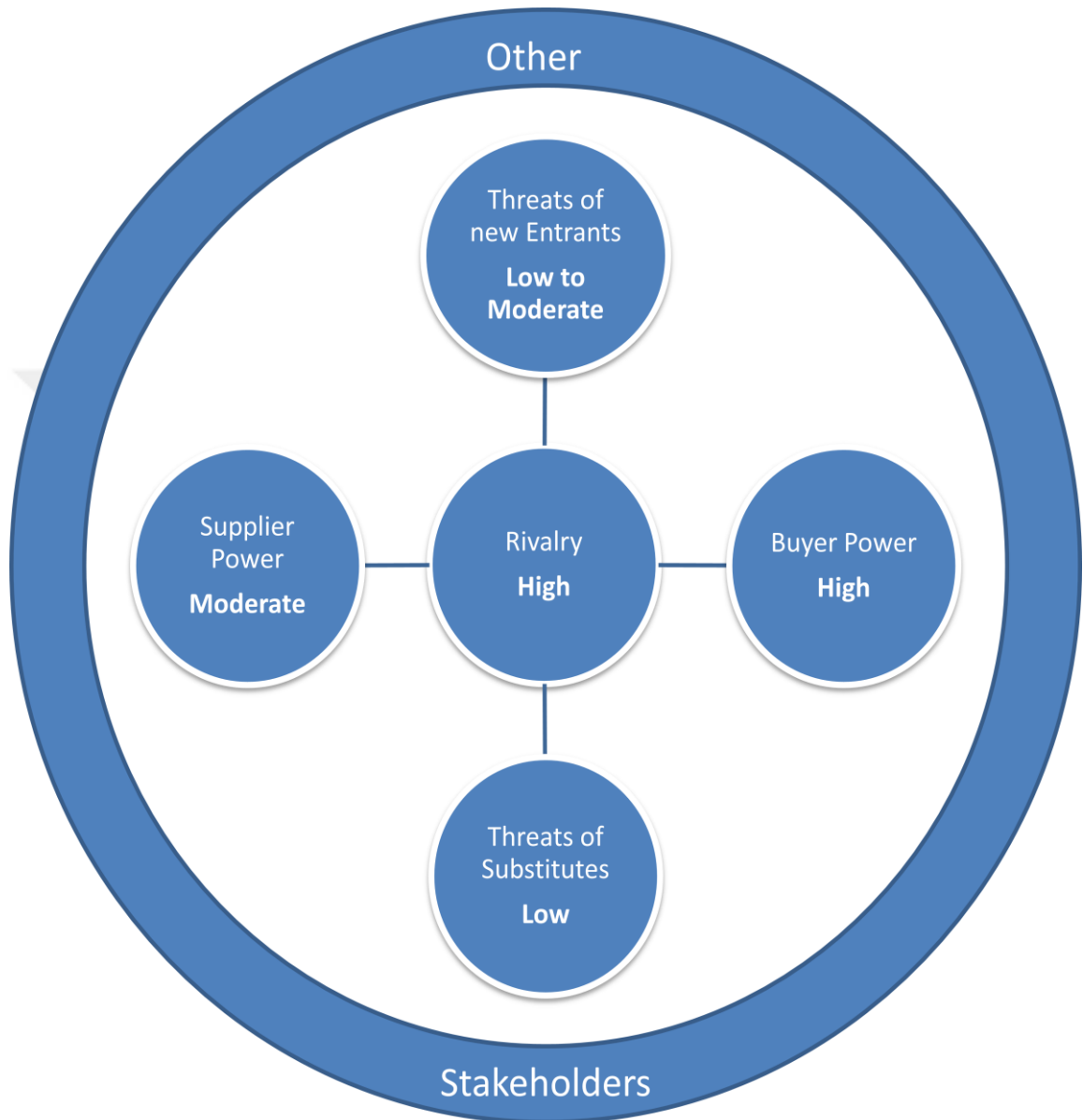


Figure 4.8 Industry value chain (PwC T&L 2030 Vol 1 2011; At Kearney 2010)

SCM is useful every part of the chain, therefore companies need to invest communication infrastructure and need to manage their network. In order to provide extra service and special solutions customer requirements and planning have high importance.

Figure 4.9 shows sector's forces and institutional pressures.



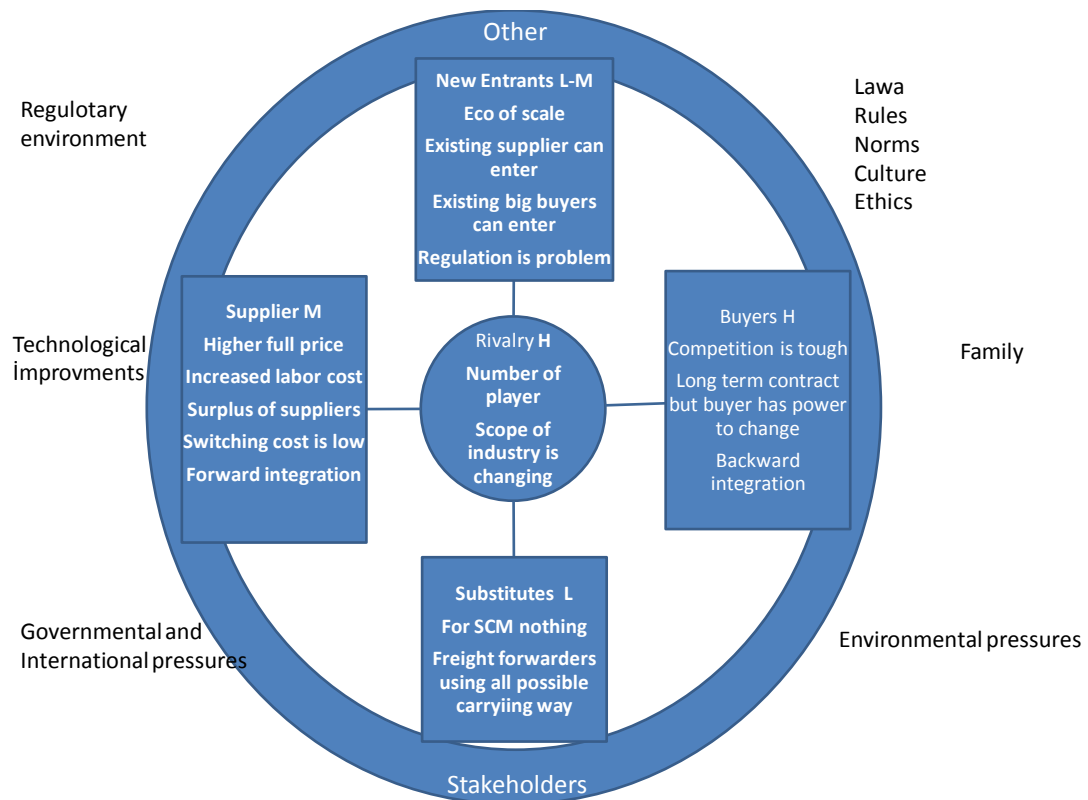


Figure 4.9 Edited version of 6 Forces analysis (Edited by Wheelen and Hunter 2003; DB Schenker, 2011; Logistics, 2009)

- Threat of new entrants:** In the Freight forwarders and logistic sector, the threat can be regarded as low to medium. It is low due to the critical mass and it provides cost advantages and high retaliation (this retaliation also arises from institutional pressures, uncertainty and prevailing need to become professional), player in the market has brand identity such as DHL, TNT, CEVA, SCHENKER. Furthermore, as I mentioned earlier section, Firms looking for long term contract and it leads high switching cost. (PwC, 2011) Existing customers have access to global value and distribution channels; these can be attributed to the presence of high entry barriers. But on the other hand, Supplier of distribution equipments and focus player can try to enter global SCM markets. Such as TNT changed its position courier to industry special solutions provider (TNT, 2011). It is possible for other providers such as Maersk, Arkas and others. Therefore, in concept of supply chain management, domestic and local players can try to manage their urban distribution channel. These can be attributed to be medium power.
- Threat of substitutes:** Threats of Substitutes mentions a threat of substitute product which has the same or similar features. In freight forwarder and logistic

industry, freight forwarders provide all type of distribution so there is not any threat from substitute.

- **Bargaining power of customers:** Buyers have a plethora of options to select from. Therefore, the bargaining power of customers is high. Sector depends on long term contracts it causes large volumes of trade so buyers have right to demand better price. Although sectors revenue increased, profit decreased dramatically. (Datamonitor, 2009) Sector is going to be commodity therefore; undifferentiated products make price negotiation easier for buyers. On the other hand, buyers need SCM and logistics firm to distribute but low switching costs help to buyers to get price discounts. In order to reduce bargaining power of buyers, firms give importance of innovation, efficiency and new product/process. (Datamonitor, 2008; PwC 2011)
- **Bargaining power of suppliers:** This dimension is characterized by a medium bargaining power of suppliers. This is mainly because of the fluctuations of oil prices. Also, the switching costs between changing suppliers are medium due to long term contracts. At the same time suppliers can try forward integration. Overall we can assume sectors supplier bargaining power is medium. (Datamonitor 2008)
- **Competitive rivalry:** Rivalry in this industry is quite high with the fact that the industry has reached a mature stage but sector is always trying to find new S curve (innovation) Increasing bargaining power of buyers affect margin and commoditization causes price competition. Isomorphism led companies to act in the same way. Moreover, High exit barriers lead to competition. Overall, competition in the industry is quite high. (Datamonitor, 2009)
- **Other stakeholders:** The adapted version of Porter's 5 forces model has a sixth element that includes other stakeholders, in commoditization process; stakeholder will turn to be institutions. Therefore, governments, international associations, norms, laws, regulatory environment, partners and environmental associations pressures needs to be considered. All country has own associations such as in UK, British International Freight Association in Europe, European Logistics Association etc. In international based, international warehouse logistic associations, the international society of logistics can be given as examples. (BIFA, 2011; Elalog, 2011; IWLA, 2011; PwC, Vol 2, 2011) Therefore, in logistics market, other stakeholders power is high due to cost of adaptation.

Overall sector was affected by both industrial forces and institutional pressures In

order to overcome these institutional pressures firms are looking to differentiate their service or trying to defining new market such as Fourth party logistics (4PL) or sector specific solutions. Therefore, company’s competences will shape the sector in the future.

4.2.1.2.4 What are the Objectives of Schenker

Schenker present their main competences in its website (2011) “Strong network, attractive industry-specific solutions, sustainable climate protection” Schenker is providing logistics, transportation, warehousing, special solutions and supply chain management service in 5 different business units. Figure 4.10 represent business units’ and its position in global market.

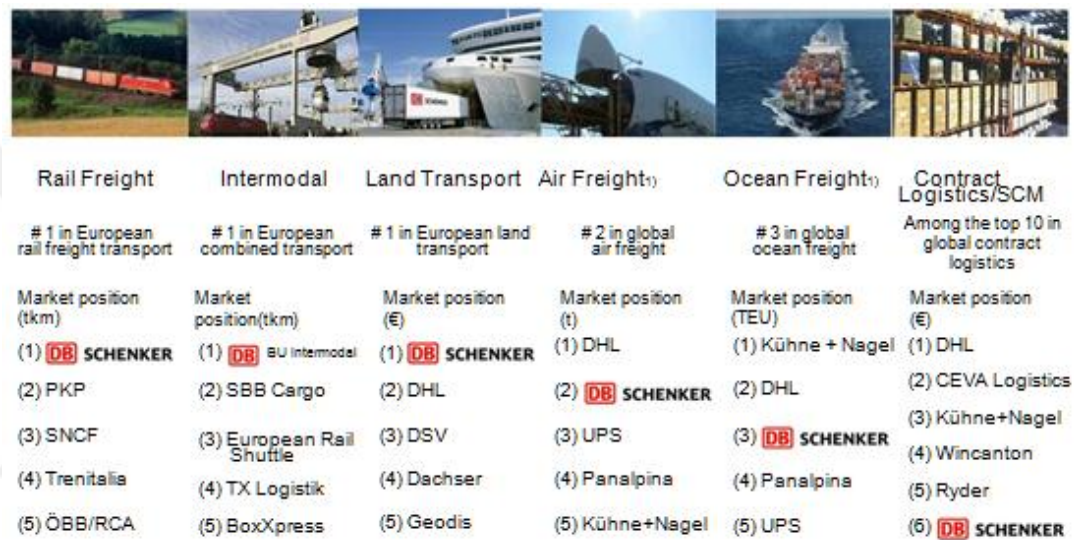


Figure 4.10 Business units and its positions (Schenker, 2008)

In the past, sector was shaped by *network coverage, operational efficiency (technology), product range and customer driven solutions (supply chain management and industry specific solutions)*. (PwC, T&L Vol 3, 2011) But nowadays new function was appeared, *sustainable environment management* that involve environmentally friendly decision and organisational management. (PwC T&L Vol 1, 2011)

In order to compare Schenker’s position in the market this paper edited Treacy and Wiersema value discipline model. Figure 4.11 shows past situation of logistic industry. By using minimum needs of sector and leaders performance. Schenker has leading position in network coverage and operational efficiency but Schenker had just provided specific needs of customer and just provided minimum needs of product and services in the past. (DB Schenker 2009) Current position of company was shown in figure 4.12 Company started to focus on Environmental management and trying to be sector leader and increase product

range and customer driven solutions. It is hard to guess new requirements in logistics industry but it is obvious to say importance of customer driven solutions will increase in future.

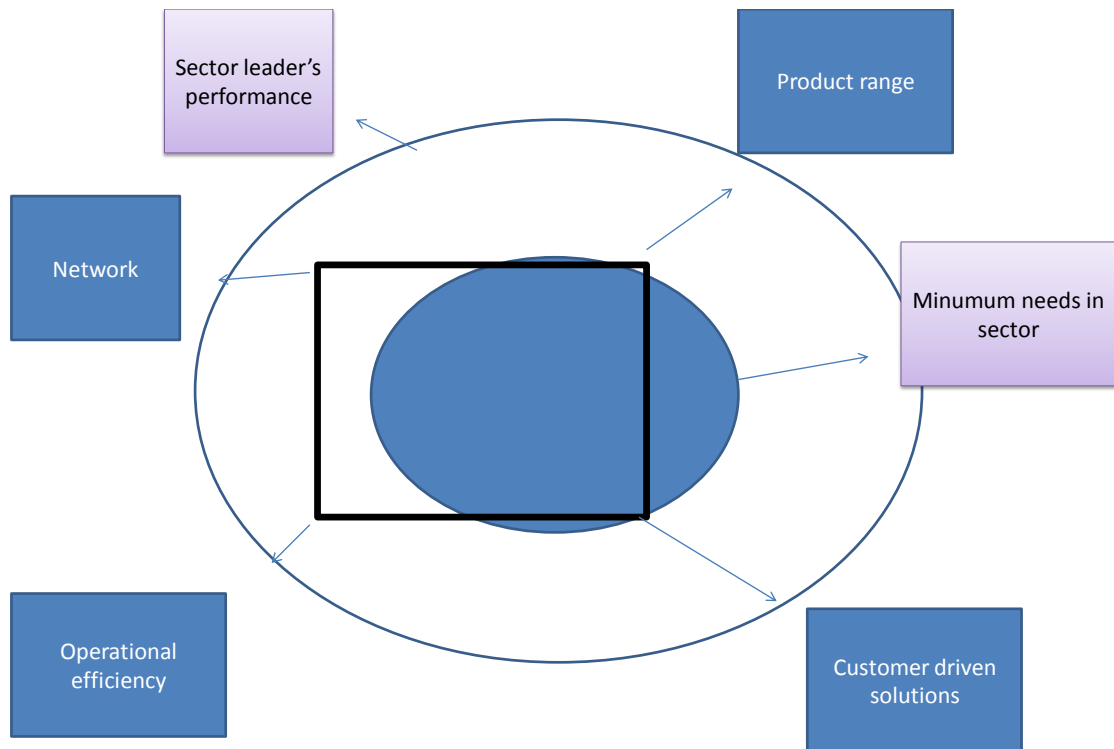


Figure 4.11 Past positioning of Schenker (edited from Treacy and Wiersema, 1995; DB Schenker 2009)

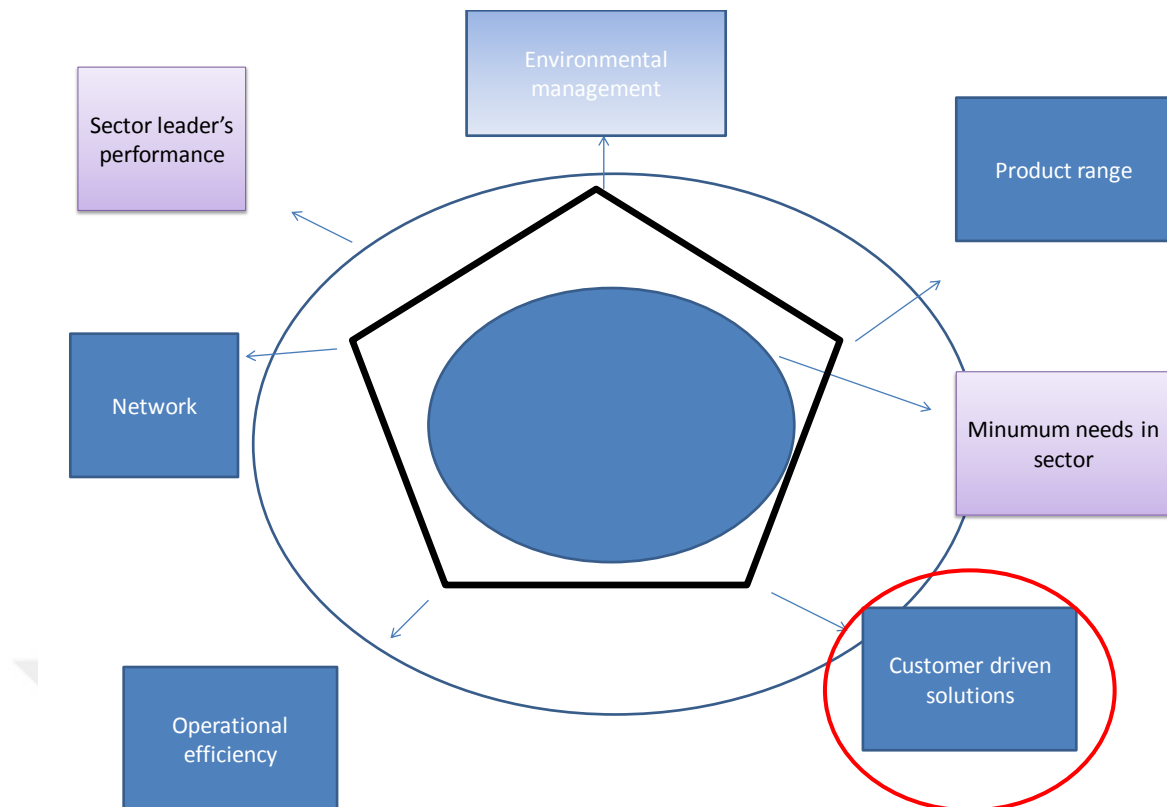


Figure 4.12 Current position of Schenker (edited from Treacy and Wiersema, 1995; DB Schenker 2011)

According to Schenker rail CEO Klaus Kremper and Schenker CEO Thomas Lieb (Logistics, 2009), four main factors will shape sector in the future, “*Needs of customer, Globalization Oil prices and alternative fuels and green logistics*”. Moreover future will bring some technological changes and these changes will let sector to define new fields. Such as space, social and urban mining. (Logistics 2009) Schenker will try to get leading position in new sector and may try to be first mover. Next part will cover Schenker resources and competences.

4.2.1.3 Look Inside

Sector affected by commoditisation and companies would like to define a market to get advantage, (Manatayev, 2004) In order to define new market, competences and resources play a important role. This part focuses on Resources and competences, First companies resources was showed and then resources based view was applied by using both Peteraf (1993) and Barney (1991). After that competences tree was applied.

4.2.1.3.1 Resources and Resource Based View

Resources can be divided five main dimensions those are financial, physical, technological, reputational and human. Table 4.3 shows company’s resources and their

criteria that were based on Barney (1991) VRIO framework. In VRIO framework *V* represents valuable resources, *R* represents to be rare, *I* represents inimitability *O* represents organizational readiness.

RESOURCE		CHARACTERISTICS	INDICATORS	V	R	I	O	TYPE OF RESOURCES
	Financial	Access to use DB funds	2.370 mn EBIT					Unique Res
		Solid financial structure in schenker	670 mn EBIT					Threshold R
Tangible Resources	Physical	Global locations	1500 company locations					Threshold R
		Global player						Threshold R
		Special carrying equipments	70 million shipments in Europe to world (2007)					Threshold R
		Europe leader in rail transport	Europe's largest Auto carrier					Core Competences
		Warehouses	312.8 mn tons rail carriage					Threshold R.
			500 warehouses in 68 country					
Intangible Resources	Technology	Process management capabilities	Process excellence awards					Core Competences
		Technological based SCM						Threshold R

- Positive
- Neutral
- Negative

Table 4.3 Resources of Companies (Schenker 2011)

Schenker's resources are generally threshold resources it means Schenker is providing sector's requirements. All resources providing value to company and organization is ready to absorb them. However, overall company's resources have rarity and inimitability problem. It shows us how sector is getting commoditized. On the other hand, company's owner "Deutsche Bahn's" resources, global reputation and find a supplier and find a customer networking are unique resources. These come from being rare and help to company to create core competences. Process management capacity and Rail networking ability help company to gain competitive advantage. As we mentioned, Deutsche Bahn (DB) acquired Schenker in 2003 Figure 4.13 and 4.14 summarise main aim of DB. DB aimed to combine DB's network mobility capability and Schenker's logistics capability. After the acquisitions its revenue increased gradually. (Datamonitor, 2008; Datamonitor, 2009; DB Schenker, 2011; Logistics, 2009, Datamonitor 2008, Datamonitor 2009).

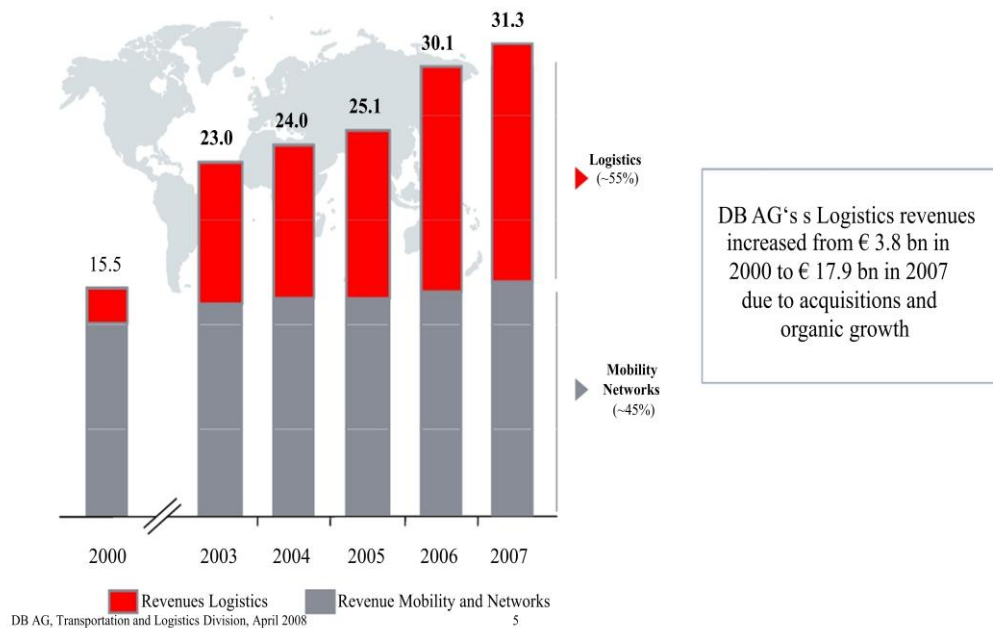


Figure 4.13 DB Group revenue in bn Euro (DB Schenker 2008)

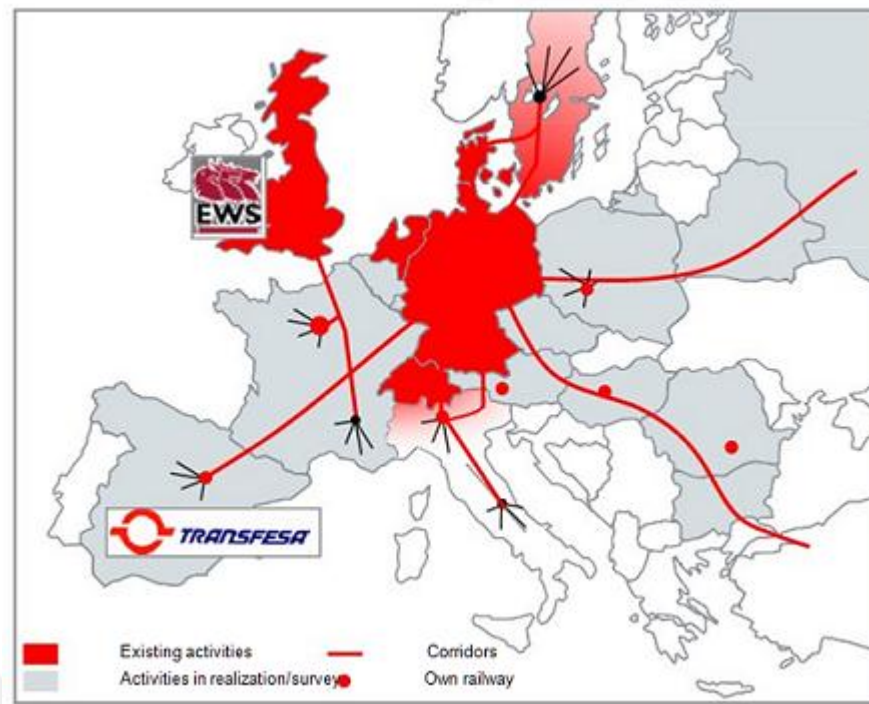


Figure 4.14 Rail network of DB (DB Schenker 2008)

Before giving overall competences and RBV, quick overview helps to see its position and understand where competences come from. Figure 4.15 shows five business units of Schenker and their important information.

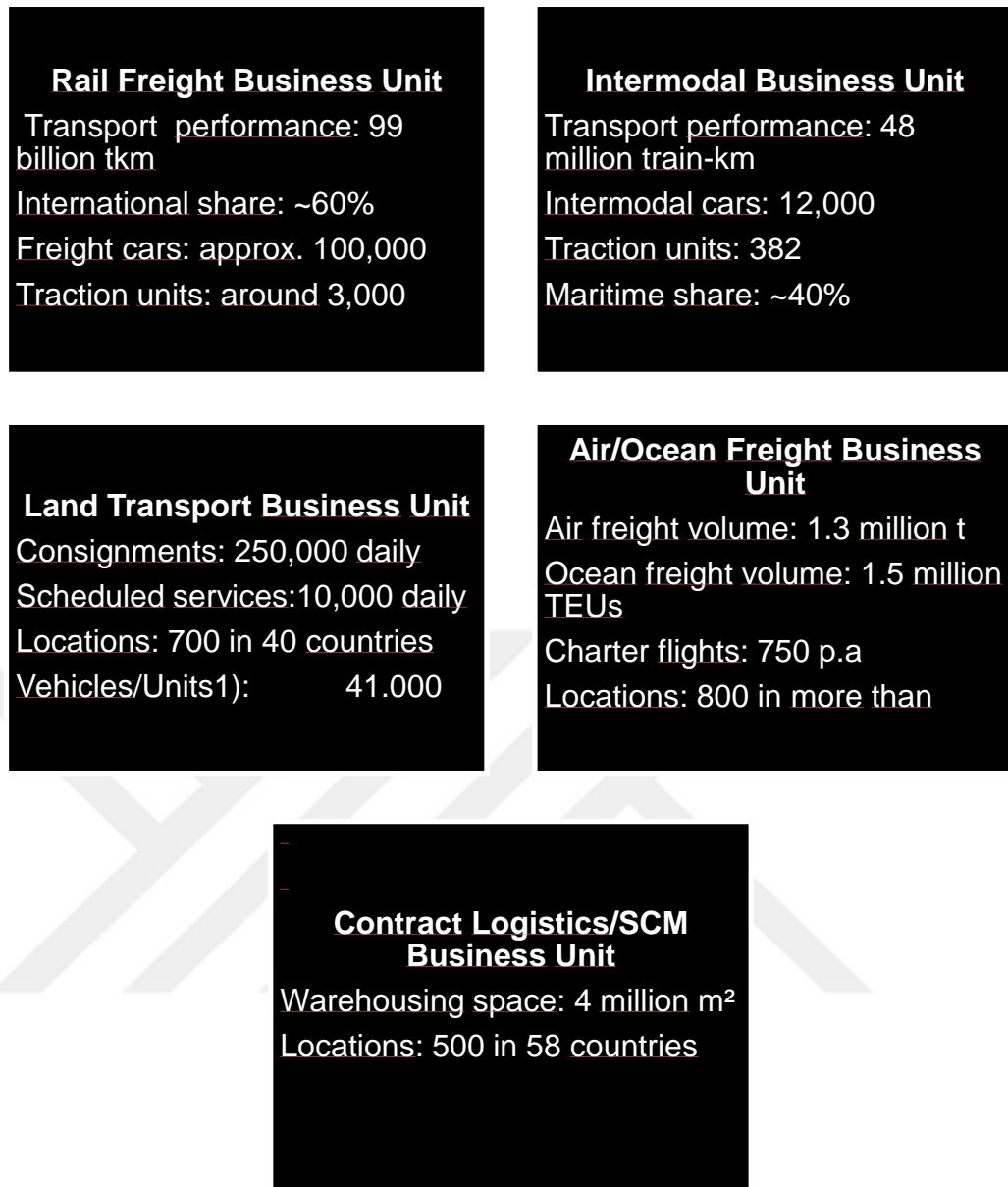


Figure 4.15 Business Units of Schenker. (DB Schenker, 2008; DB Schenker, 2011)

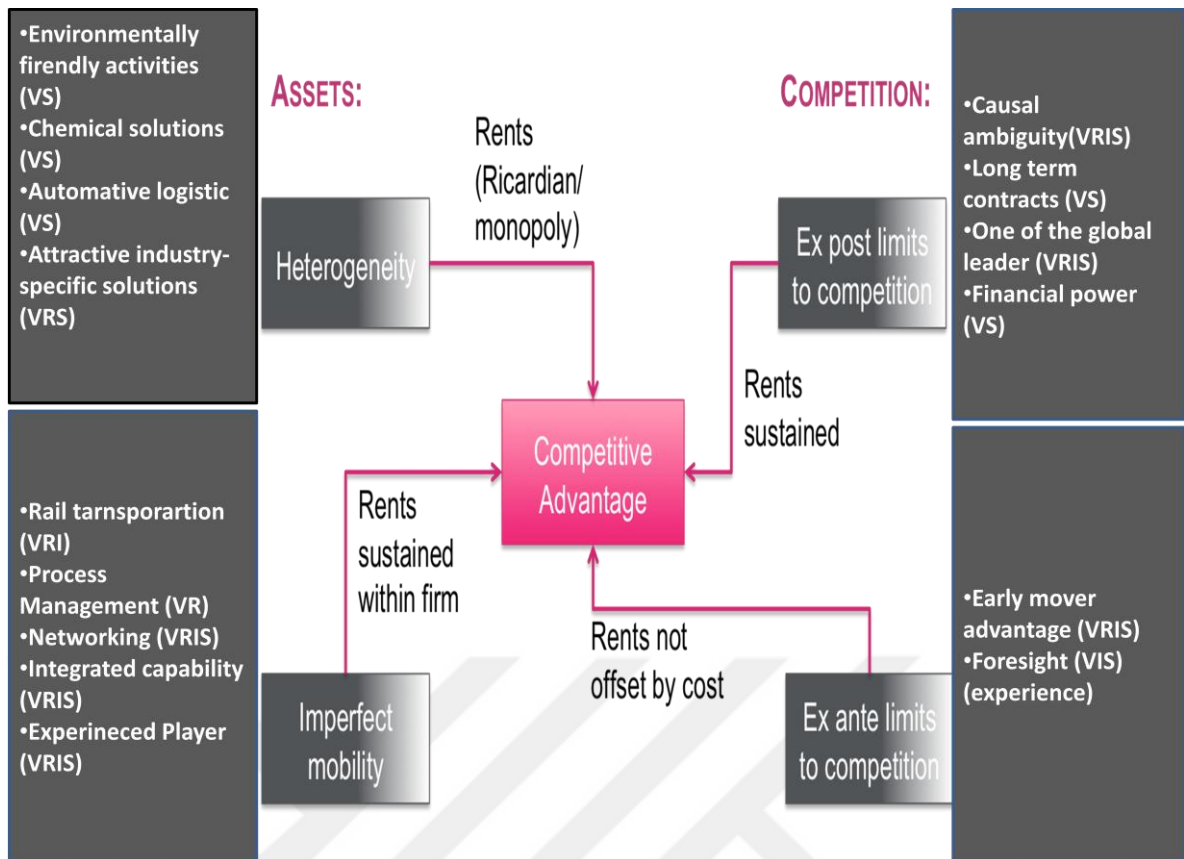


Figure 4.16 RBV: Cornerstones of Competitive Advantage (Peteraf, 1993; Barney, 1991; DB Schenker 2008)

This diagram shows competences and core resources. It assesses these resources or competences by using value (V), rarity (R), inimitability (I) or non substitutability (S). Heterogeneity arises from differentiation. However, in this sector most of the services are homogenous due to commoditisation. Schenker and its rivals are looking forward to be different by providing industry specific solutions (Manatayev, 2004). CSR activities are common and companies are using it to be different (CSR is using for being **environmentally friendly and ethical**) (Logistics, 2009). In the case of ex-post limit to competition, the company should acquire imperfect inimitability by using isolating mechanisms such as property rights causal ambiguity, time lag and Information asymmetries. (Peteraf, 1993) Schenker's stable financial structure, leader global positions and managerial casual ambiguity help to ex post limit to competition. (DB, 2011)

Imperfect mobility has risen day by day due to increasing experience of company. Schenker has good rail management system and integrated capability. These help company to be imperfectly mobile. Moreover process management, networking and negotiation power over the supplier help it to inimitability. Ex ante limit to competition is one of the major issue in this industry due to rising importance of being different and defining new

market. Early mover advantages lead to further ex-ante limits to competition. Companies are looking to be first mover in new special solution market. (PwC T&L 2030, 2011) (Datamonitor 2009)

4.2.1.3.2 Competences tree

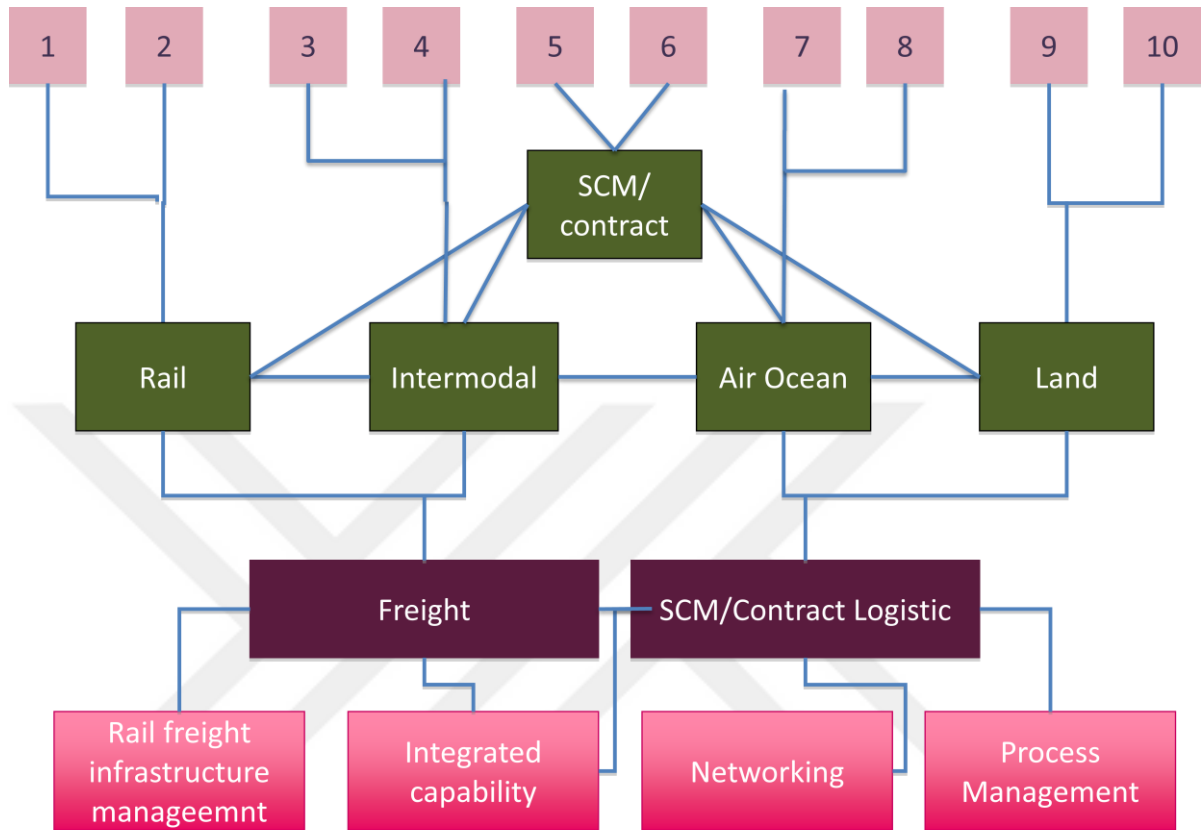


Figure 4.17 Competences tree (Tree metaphor) (Prahalad and Hamel, 1990 DB Schenker, 2008; Logistics, 2009; DB Schenker, 2011)

According to the diagram 4.17, Schenker’s all services are related to each other, for examples the SCM division depends on other divisions, SCM work needs to use rail/land and intermodal transportation. Therefore, Schenkers one of the main competences is integrated capability which arises from owner company Deutsche Bahn. Furthermore, Deutsche Bahn provides rail infrastructure management and networking capacity (Both supplier and partner way) that provide negotiating power over suppliers. One of the other competences is “Process management” which is new issue. It helps managing all knowledge, skills, tools and techniques in process. One of the branch of Schenker have been awarded by process excellence committee in 2011. (DB Schenker, 2011; Logistics, 2009; Process excellence, 2011)

4.2.2 Analysis of main competitor and stakeholders

In logistic industry, competitions and institutional pressures are the key decision driver for companies (Datamonitor, 2008). Stakeholder analysis reflect most powerful stakeholder and help to generate strategy in following stages. Therefore, making competition based analysis and stakeholder analysis are crucial for logistics industry.

4.2.2.1. Stakeholder analysis.

For stakeholder analysis, this paper used Stakeholder Attributes model (Mitchell, Agle & Wood, 1997). Figure 4.18 shows main stakeholders and their attributes:

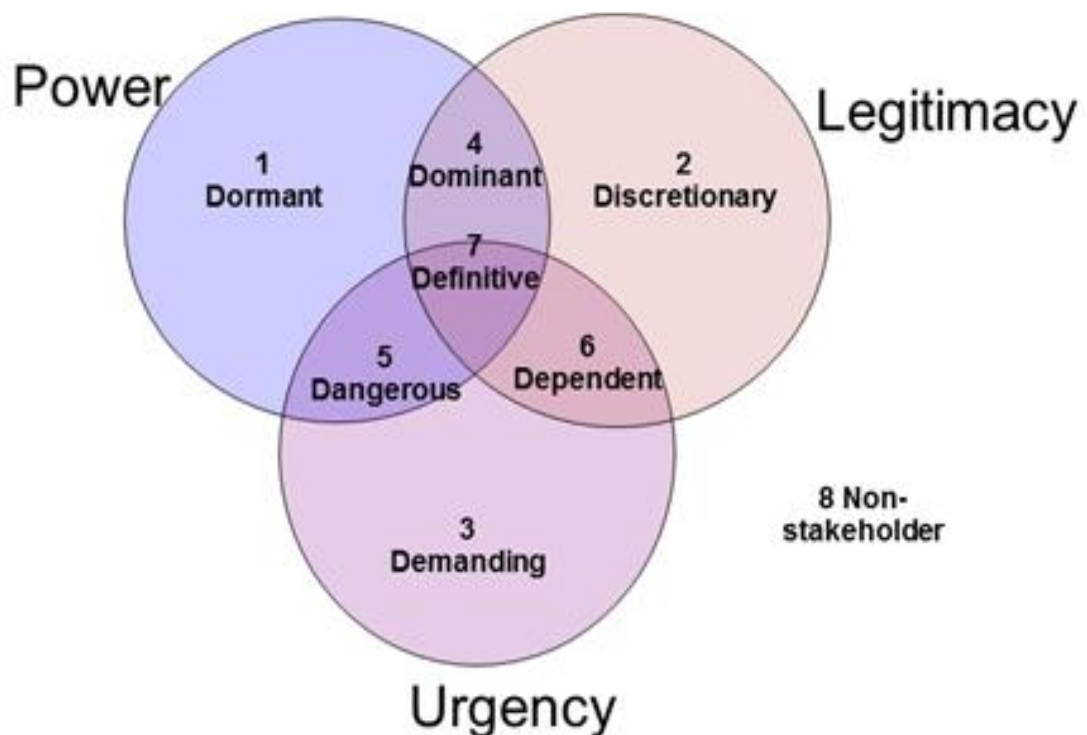


Figure 4.18 Salience of stakeholder (Mitchell aple and wood 1997)

Commoditisation is the one of the main threats for sector. Service is going to be more similar (Manatayev, 2004). If sector is going to be commodity, Institutional pressure will occur and increase day by day. In other words commoditisation of this service can be traced to the strong presence of inter-industry isomorphism. Institutional pressures generally arise from stakeholders. Salience of Stakeholder model represents classification of stakeholders attributes in 3 main dimension, power legitimacy and urgency, according to model there are eight types of stakeholder they are;

1. **Dormant:** Inactive or prospect (refer Figure 4.3) Other governments, EU NAFTA, Political groups
2. **Discretionary:** Air transportation suppliers, Land transportation suppliers
3. **Demanding:** C, D and inactive type of customer (refer Figure 4.3), Potential competitors (DHL Kuehne Nagel Ceva)
4. **Dominant:** Prospect (refer figure 4.3) Oil suppliers European Logistics Association international warehouse logistic associations, the international society of logistics and etc
5. **Dangerous:** Government (German)
6. **Dependent:** Ship transportation suppliers
7. **Definitive:** A and B type of customer (refer Figure 4.3) Main competitors (DHL Kuehne Nagel, Ceva) Shareholder
8. **Non Stakeholders:** Other organisations.

In schenker case, most important stakeholders are;

Dominant stakeholders are Prospect (refer Figure 4.3) Oil suppliers, European Logistics Association international warehouse logistic associations, the international society of logistics and etc They have power and at the same they have long term relationships. Schenker needs to take care of them. (DB Schenker 2011) (Logistics 2009) (Datamonitor, 2008)

Dangerous stakeholder is Government (German) they needed to be sacrificed in short term Ship transportation suppliers are one of the main important stakeholders due to the fact that globalization. Ship transportation suppliers has long term contract and they need to be satisfied as soon as possible because their business is time consuming part of logistics. (Datamonitor, 2008)

Finally, most important stakeholders are A and B type of customers (refer Figure 4.3) Main competitors (DHL Kuehne Nagel, Ceva) and Shareholders, shareholders and customers are needed to be satisfied promptly. However management of main competitors are different from customer and shareholders. Therefore, next section focused on competitor analysis.

4.2.2.2 Competitor analysis

For competitor analysis these paper used information form strategic group analysis (Figure 4.4 and Figure 4.5) to determine real competitors. After that this paper determined “Competences, capabilities, strategies and future views” of them. CEVA, DHL and Kuehne Nagel are main rivals, TNT and Panalpina are potential rivals.

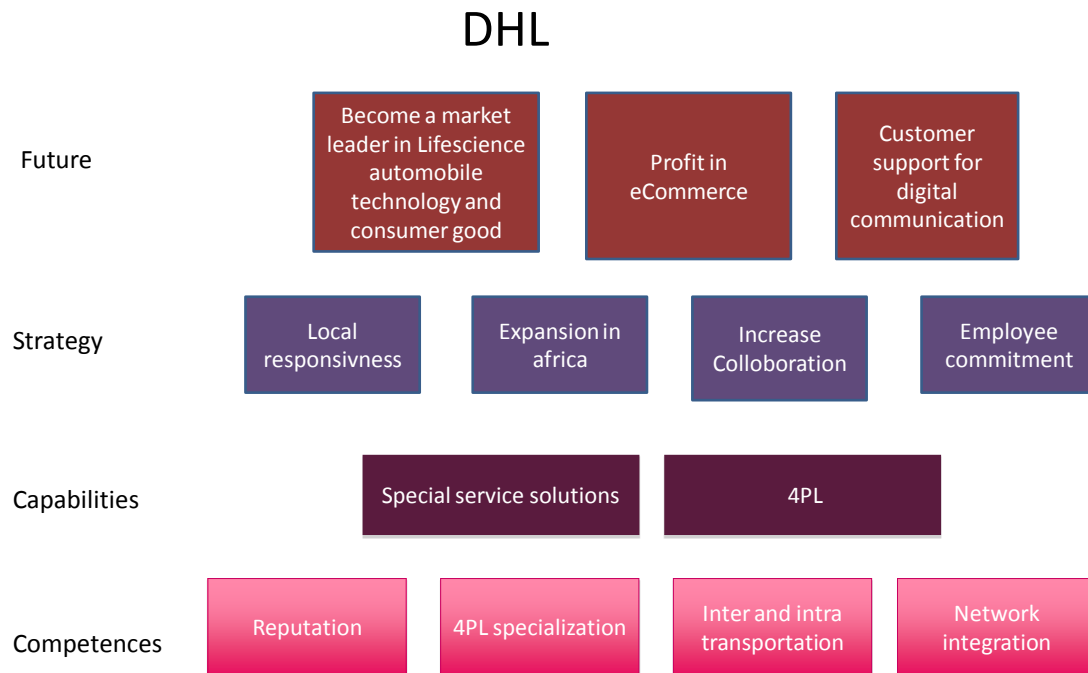


Figure 4.19 DHL (DHL investor call, 2009)

DHL’s main competences arise from its reputation and late mover advantage, DHL established as post and mail company in 1990’s they entered Freight forwarding market and it helps DHL to gain sector specific solutions advantage. They used their reputation and sector specific aspects. Nowadays they focused on 4PL and designing customer distribution network. Their capabilities depend on being specialist, providing special service solutions.(DHL, 2009)

DHL is pursuing four main strategies nowadays; first they are trying to increase local responsiveness to be agile and adaptive. Another strategy is increasing collaboration to expand 4PL. Globalization affects every world and DHL increase expansion to pan Africa to be early mover. (Bloomberg, 2011) Overall these strategies depend on employee; DHL is looking forward to increase employee commitment. For their future direction, DHL is looking to be world special solutions leader in lifescience, automotive, technology and consumer goods. At the same time being part of e commerce trade is one of the main

future aims. Sector is going to be more digitalized and digitalizing helps logistics company, DHL aims to help customer to use digital information. (DHL, 2009)

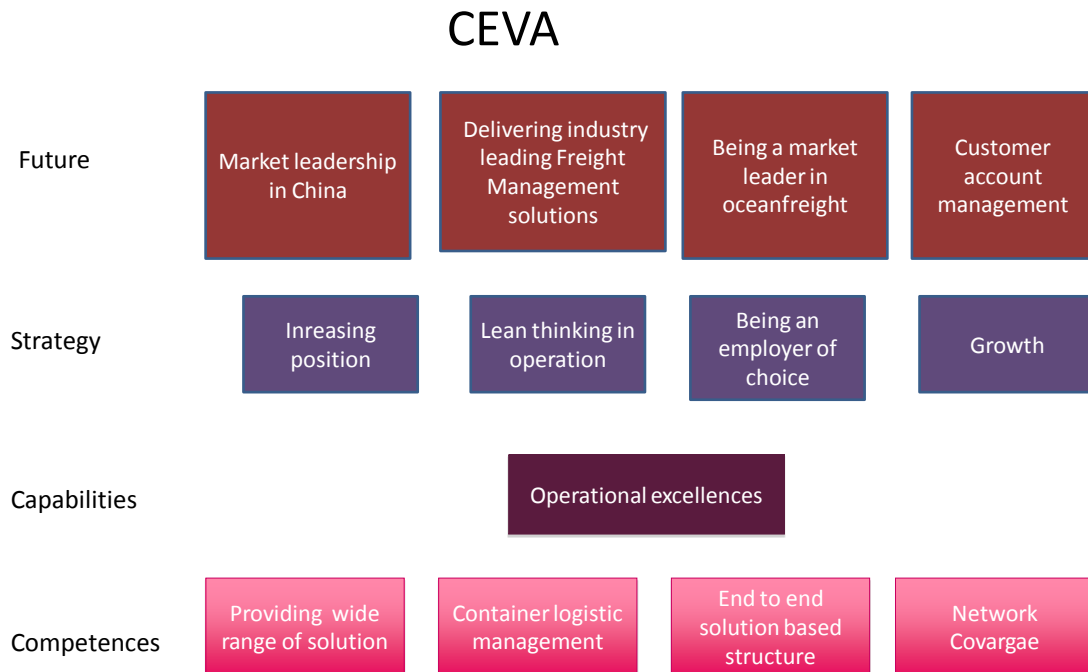


Figure 4.20 CEVA (Ceva road map, 2011)

CEVA is new company it was established in 2006 by Apollo management LP that acquire first TNT contract logistic and then EGL (Texas based company) (Ceva, 2011). After the merger, company’s main competences arise from container logistics and wide range of end to end special solutions. Main capabilities of company arises from being a new company, CEVA’s all process depends on lean thinking and operational excellences which lead company in lean manufacturing process and providing wide range of solutions. (Ceva, strategy road map, 2011) (Ceva philosophy, 2011)

CEVA is pursuing growth and leveraging position strategies nowadays. They are seeking to leverage position by using lean manufacturing solutions and container logistics management. For future, CEVA is looking to be market leader in ocean freight and in China. At the same time, they wanted to increase customer management systems by allocating account manager for all customers. They wanted to be special in freight forwarding industry and they looking forward to define new market, “*special freight forwarding solutions*” by consultancy service. (Ceva strategy, 2011)

Kuehne Nagel (KN)



Figure 4.21 Kuehne Nagel (KN) (Kuehne Nagel, 2011; Eye for Transport 2009)

Kuehne Nagel is a freight forwarding company based in Switzerland. Its main business area is ocean, SCM and air freight. KN's IT infrastructure helps KN to provide special SCM solutions. Although it is strongest in its home European markets, KN pursuing organic growth strategies to enter US and Asian markets. (Kuehne Nagel, 2011)

KN's main competences arise from its experience and IT based infrastructures. KN is growing by acquisition, strategic alliances and organic growth. Therefore, its main capabilities are growth and ocean/air based SCM solutions. (Eye for Transport, 2009)

Nowadays KN is pursuing growth strategy due to the fact that recovery in the market. Their main target is special solution market and using growth management competences to reach every part of the world. Moreover KN wants to protect their margin. For future, KN is looking to increase niche capacity such as hotel and marine logistics and leverage solutions by focusing on customer and partner relationship. (Kuehne Nagel north America, 2011)

Overall these three rivals are pursuing nearly the same strategy but for future they are looking for different markets. However customer relationship management will be the main issue. Next part focused on uncertainties in the sector for future scenarios.

4.2.3 Generation of uncertain and predetermined factors

Uncertainties and predetermined factors were generated by Macro environmental analysis that was shown in PESTEL analysis (Political, Economical, Socio-Cultural, Technological, Environmental, Legal. But in this case, legal factors are shown in Political factors.)

Next chapter will reduce the number of uncertainties to make it manageable. Table 4.4 shows uncertainties.



<p>POLITICAL</p> <p>(1) Government expenditure trend on transportation infrastructure</p> <p>(2) Expansion of EU</p> <p>(3) Level of Cross national association</p> <p>(4) Regulation differences</p> <p>(5) Stability in Middle east, Pakistan, Afghanistan.</p> <p>(6) Role of military</p> <p>(7) Market Role of Africa</p> <p>(8) Consolidation in emerging economies</p> <p>(9) Government production incentives</p> <p>(10) Privatization of transportation infrastructure</p> <p>(11) New routes and logistic countries</p>	<p>ECONOMICAL</p> <p>(12) Changing way of business (e-business)</p> <p>(13) GDP Growth in EU/US</p> <p>(14) GDP Growth in BRIC/E7</p> <p>(15) Crude oil/fuel price fluctuation</p> <p>(16) Threat of recession</p> <p>(17) Purchasing power</p> <p>(18) Level of competition</p> <p>(19) Exchange rates</p>
<p>SOCIO-CULTURAL</p> <p>(20) Level of Urbanization</p> <p>(21) Level of consumption</p> <p>(22) Mega cities</p> <p>(23) Nationalism</p> <p>(24) Social stress</p> <p>(25) Demographic differences (Age)</p>	<p>TECHNOLOGICAL</p> <p>(26) Nano Technology</p> <p>(27) Cyber terrorism</p> <p>(28) Impact of new It systems</p> <p>(29) Level of Commoditization</p> <p>(30) Development of energy solutions</p> <p>(31) Space transportation</p>
<p>ENVIRONMENTAL</p> <p>(32) Level of sustainability</p> <p>(33) Level of emission rate and co2 footprint</p>	<p>OTHER FACTORS</p> <p>(36) Fair of Terrorism</p> <p>(37) Quantum Leap (Molecular transportation)</p>

Table 4.4 Uncertainty Factors

Political factors

(1) Government expenditure trend on transportation infrastructure

Logistic industry quality depends on transportation infrastructure (PWC T&L 2030 vol 2, 2011). According to PWC Transportation & Logistic 2030 report (2011), main question in transportation infrastructure is “what are the most effective ways of financing transport infrastructure? What will be the role of public sectors and private investors?” Nowadays there is an increasing trend on private infrastructure. However role of government may be big uncertainty. Fehmmanbelt bridge in Germany, Rotterdam port in Netherlands Gotthard base Tunnel in Switzerland are supported by government, On the other hand Marmaray tunnel and new Bosphorus channel project in Turkey supported by government and funded by both development agencies and governments, high speed railway from London to Beijing supported both private funds and governmental funds. (PWC 2030, 2011) Other issue is, cost differences between near sea and land countries. (Datamonitor, 2009) Land countries logistics costs 50 % higher than sea access countries. Therefore, many Governments have given more importance on transport infrastructure to gain competitive advantage and integrate country to global world. (UNESCAP, 2006)

(2) Expansion of EU

According to Duff and Williamson (2005) **there is possibility to broken or enlargement in EU**. Possible enlargement is Turkey Croatia, The Former Yugoslav Republic of Macedonia, Iceland, and other Eastern European countries (Europa, 2011). But there is a possibility to broken due to European debt crises.

(3) Level of Cross national association

Global world needs some regulatory and/or managing associations such as (ASEAN, NAFTA, EU and so on) Increasing importance of globalization and environmental sustainability enhance the role of logistic service provider as a network optimization partner. (Deutsche Post 2009) Therefore, new associations may be needed to regulate the new role of logistics however; changing way of the business and global context of economy may lead associations and collaborations. New associations mean new regulation and adaptation so it will be uncertainty.

(4) Regulation differences

Every country has different restriction and limit in their transportation regulations. Therefore, intermodal transportation and supply chain management companies need to

adapt all different countries regulations in transportation. For example Californian department of transportation (2011) listed height of truck is 14 feet and width of it 8.5 feet. But there is different dimension in Europe. Therefore, possible future regulation changing may be uncertainty.

(5) Stability in Middle East, Pakistan, Afghanistan.

Arab world faced to change after the demonstration. After the death of Laden Pakistan and Afghanistan position is unknown. According to UNESCAP (2006) report, Afghanistan and Pakistan's network is crucial to distribute China's good to Europe. Therefore, instability in this area may lead increasing price in air and ocean freight. (UNESCAP, 2006) Figure 4.22 and 4.23 provide information about land and rail infrastructure in Asia.

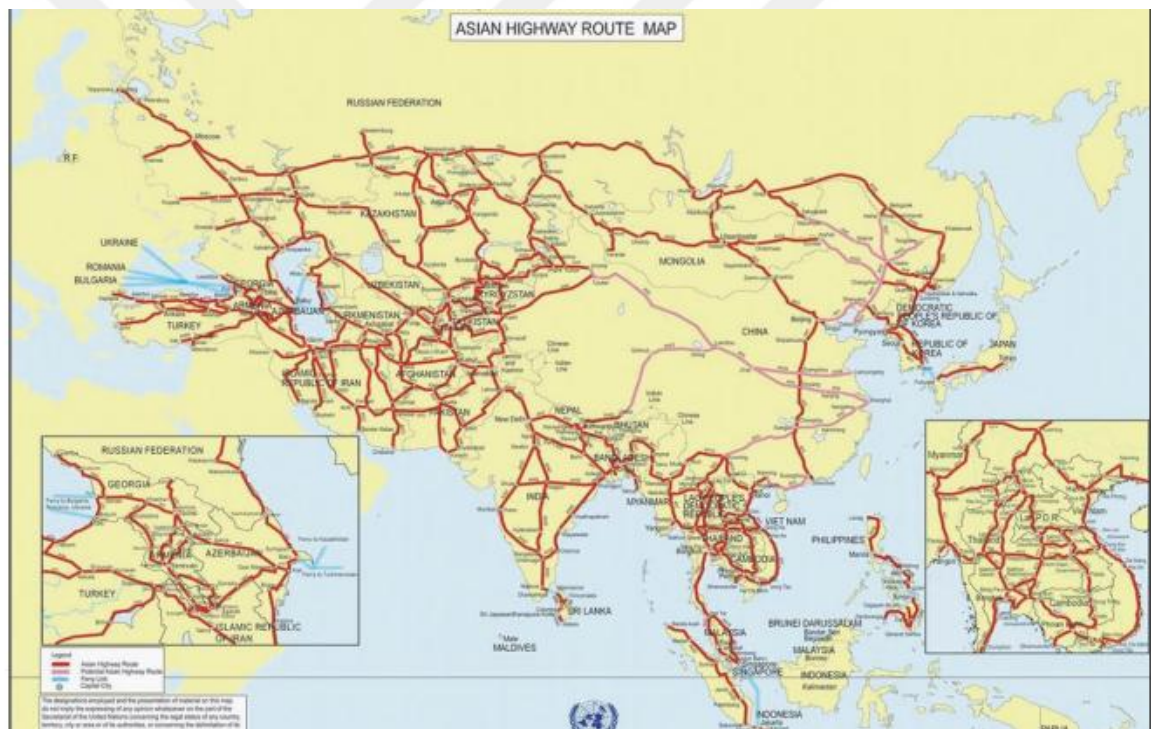


Figure 4.22 Asian highway route map (UNESCAP, 2006)

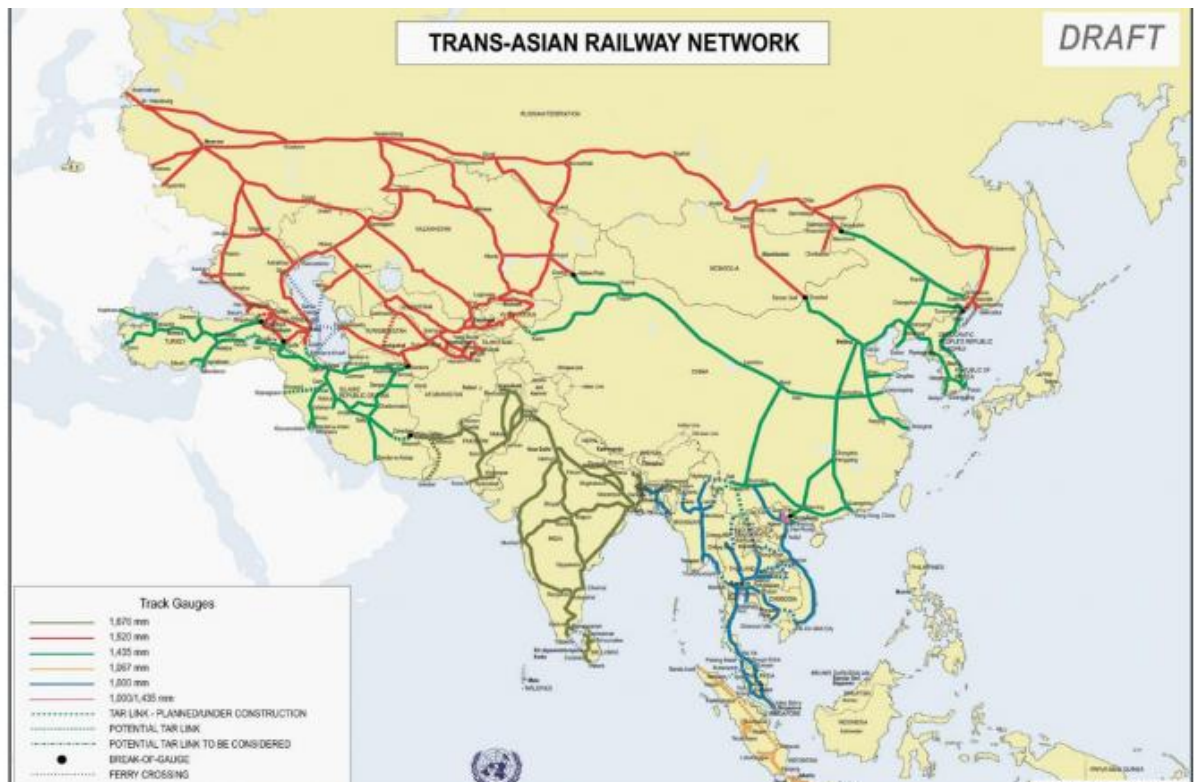


Figure 4.23 Asian railway route map (UNESCAP, 2006)

Afghanistan and Pakistan's infrastructure is not enough to provide rail and land transportation service route to companies to reach Europe. Therefore, stability may provide good infrastructure these area and after that air and ocean freight prices may decrease.

(6) Role of military

Military and logistics have worked together. Military has affected automation, communications, integrated supply chain management, single stock fund, infrastructures and helped to reduce logistical footprint distribution. (Yoe, 2004) Military has impact on logistic especially the way of transportation and efficiency. In the future military may affect logistic to open new route and define new services. (Piggea, 2002) It may be space logistics, or new positioning systems, non human air plane or truck.

(7) Market Role of Africa

“Africa's image was characterized in between civil war, oil and aids, however nowadays, globalization lead continent to be new market for MNE therefore, logistic and supply chain company may need to take care of pan Africa“(Shell, 2005). In future role of Africa may shape the all route of supply chain.

(8) Consolidation in emerging economies

According to AT Kearney CHINA 2015 (2010) report, in China sector is getting closer to be consolidated. Figure 4.24 shows comparison between US and Chinese logistic sector.

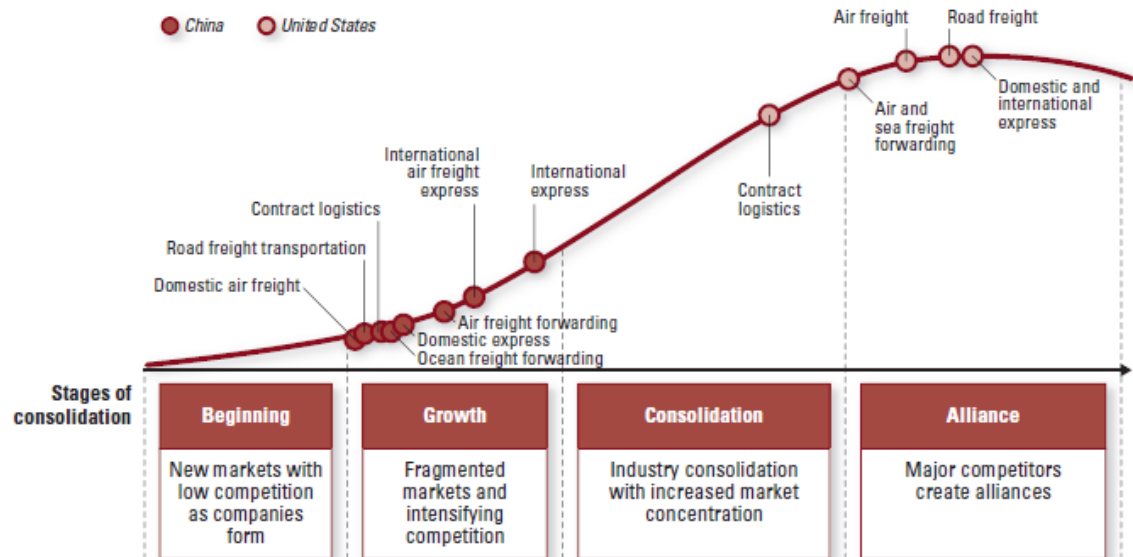


Figure 4.24 Chinese and US Logistic market comparison in terms of consolidation (AT Kearney, 2010).

According to this report Chinese company enlarged rapidly and their logistic requirements grow as well especially in coastal cities. Therefore, logistics firm's reliable services are becoming key differentiator factor. Increasing need of logistics may cause early consolidation and retaliation in sector. (AT Kearney, 2010) In conjunction of China and emerging countries, other emerging countries such as E7 countries may face to consolidation.

(9) Government production incentives

Governments provide incentives for alternative energy solutions and products, such as biodiesel production (Cubert, 2006). However, it is one of the uncertain factors due to the trends in the world is unknown.

(10) Privatization of transportation infrastructure and companies

During the last two decades the transport services have changed due to privatisation and private investment on the infrastructure. Especially, public owned companies have been sold to private sector due to needs of efficiency. Mainly Asia and Latin American transport services management have changed hand. Now private owners manage the infrastructure and companies. This situation leads sector to be more competitive. However,

it leads sector to more independent and profit conscious. It brings managerial conflict, *Do infrastructure need to generate profit or provide service for everyone?* This question is needed to be answer in the future (Estache and Rus, 2000).

(11) New routes and logistic countries

New transport corridors will emerge due to increasing importance of emerging countries especially Emerging 7 countries which are Brazil, China, India, Mexico, South Africa, Turkey and Russia. They are really important especially between Asia and Africa, Asia and South America and Intra-Asian routes. These seven countries may be main routes, consumer and producers (PWC, 2011).

Economical factors

(12) Changing way of business (e-business)

The dotcom crash brought new challenge for e-business, however, this crisis give way to sector use e marketplace. (Steinberg, 2003) E marketplaces expanded sectors coverage and create new sector for logistics companies. However, the future of e marketplace is unknown (PWC, 2011).

(13) GDP Growth in EU/US

According to European commission economic and financial affairs (2011) GDP growth is projected at 1.8% in the EU and 1.6% in the euro area in 2011. For USA IMF and World Bank are always changing growth forecast, last forecast is 2.5% (Reuteurs, 2011). Therefore, Growth in western world is one of the biggest uncertainties.

(14) GDP Growth in BRIC/E7

According PWC world 2050 report (2011), in 2050 E7 countries will take G7 countries places Table 4.5 shows the expected GDP in PPP ranking.

PPP 2009 Rank	Country	GDP at PPP (constant 2009 US\$bn)	PPP 2050 Rank	Country	Projected GDP at PPP (constant 2009 US\$bn)
1	US	14256	1	China	59475
2	China	8888	2	India	43180
3	Japan	4138	3	US	37876
4	India	3752	4	Brazil	9762
5	Germany	2984	5	Japan	7664
6	Russia	2687	6	Russia	7559
7	UK	2257	7	Mexico	6682
8	France	2172	8	Indonesia	6205
9	Brazil	2020	9	Germany	5707
10	Italy	1922	10	UK	5628
11	Mexico	1540	11	France	5344
12	Spain	1496	12	Turkey	5298
13	South Korea	1324	13	Nigeria	4530
14	Canada	1280	14	Vietnam	3939
15	Turkey	1040	15	Italy	3798
16	Indonesia	967	16	Canada	3322

Table 4.5 Expected GDP in 2050 (PWC world 2050, 2011)

Table 4.6 shows expected growth rate of countries. According the growth rate expectation E7 countries have huge growth opportunities, India (8.1%), China (5.9%), Indonesia (5.8%), Turkey (5.1%) and Mexico (4.7%) (Growth rates represent average annual real growth in GDP.) (PwC, 2011)

Country	Average annual real growth in GDP	Average annual population growth	Average annual GDP per capita growth	Average annual GDP growth from changes in MER
Vietnam	8.8%	0.7%	6.1%	1.9%
India	8.1%	0.8%	5.3%	1.9%
Nigeria	7.9%	1.5%	5.0%	1.3%
China	5.9%	0.1%	4.6%	1.1%
Indonesia	5.8%	0.6%	4.1%	1.1%
Turkey	5.1%	0.6%	3.4%	1.0%
South Africa	5.0%	0.3%	3.6%	1.1%
Saudi Arabia	5.0%	1.4%	2.7%	0.9%
Argentina	4.9%	0.6%	3.0%	1.2%
Mexico	4.7%	0.5%	3.2%	1.1%
Brazil	4.4%	0.6%	3.3%	0.5%
Russia	4.0%	-0.7%	3.2%	1.4%
Korea	3.1%	-0.3%	2.6%	0.9%
Australia	2.4%	0.7%	1.9%	-0.2%
US	2.4%	0.6%	1.8%	0.0%
UK	2.3%	0.3%	2.0%	0.1%
Canada	2.2%	0.6%	1.7%	-0.1%
Spain	1.9%	0.1%	1.8%	0.1%
France	1.7%	0.2%	2.0%	-0.5%
Italy	1.4%	-0.2%	1.9%	-0.2%
Germany	1.3%	-0.3%	1.9%	-0.3%
Japan	1.0%	-0.5%	2.1%	-0.5%

Table 4.6 Annual growth rate expectation (Pwc world 2050, 2011)

(15) Crude oil/fuel price fluctuation

Oil price is the most important operational cost for SCM companies. The price of oil is a key factor for T&L. The extreme price fluctuations are seen during the past 20 years. Oil price volatility is a significant risk for the sector. Alternative energy may take a place of diminishing oil reserves (PwC, 2011). However it is hard to forecast it. US Energy Information Administration (EIA) published two reports for oil price Figure 4.25 shows their expectation. EIA expectation was changed in just one year, therefore oil price is one of the biggest uncertainty factors.

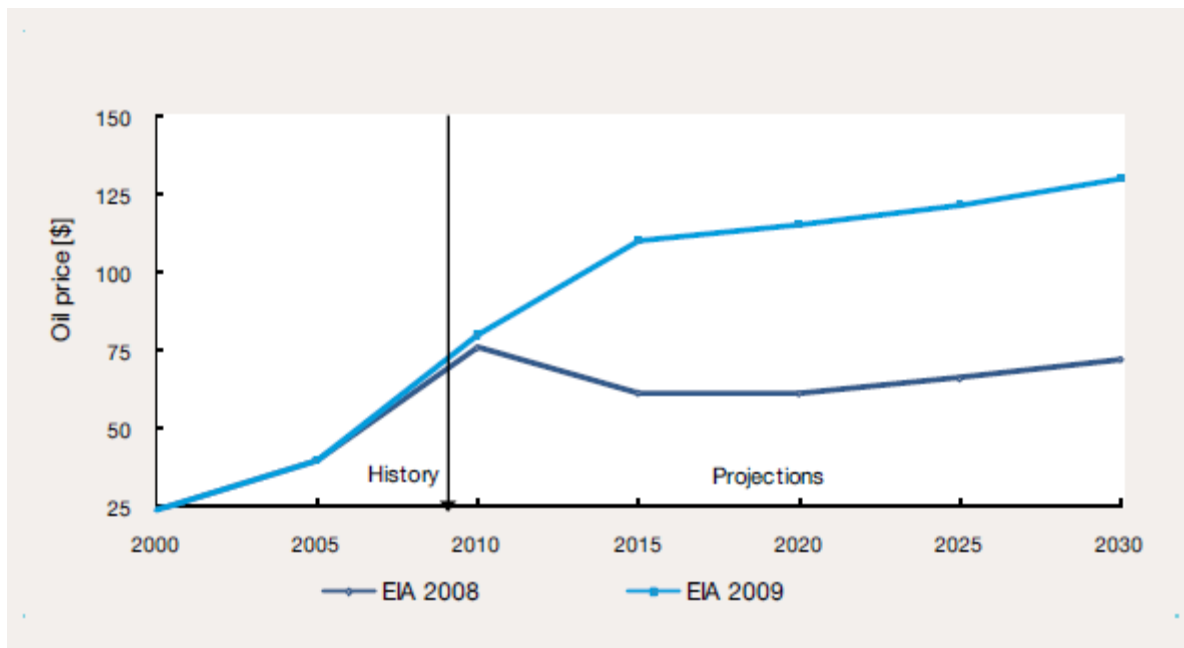


Figure 4.25 Oil price, price projections (PWC T&L 2030)

(16) Threat of recession

World faced economic crisis in 2008 and 2009. It caused widespread economic stagnation and recession. Many governments took action to recover their local economies via massive investment spending. Pattern of global recession is unpredictable and it affects worldwide all industries.

(17) Purchasing power

The economic growth in emerging countries in recent years caused purchasing power shifting. According to a PwC (2011), “G7, (the US, Japan, Germany, UK, France, Italy and Canada), will be overtaken by the ‘E7’ by 2050.” “E7 economies are expected to be around 25% larger than the current G7 by market exchange rates (MER) or around 75% larger in purchasing power parity terms” (PwC T&L 2030 vol3, 2011). Therefore, purchasing decision will be changed, new countries will shape the world purchasing decisions.

(18) Level of competition

Logistic services are getting more commodity services. Especially in air, ocean, rail and land freight services are the same in everywhere. Commodity products cause retaliation and competition in sectors. Moreover, pattern of commoditization is unpredictable (Manatayev 2004).

(19) Exchange rates

In logistic industry, Dollar was the main currency but after the Euro, Euro started to be second currency in the freight market. But emerging countries such as Turkey and Russia signed a number of agreements to deepen their economic relations and started to use their currency instead of dollar or euro. This may be trend in the future in between emerging countries to bypass western countries money currency.

Social

(20) Level of Urbanization

Urbanization affected GDP per capita especially Brazil, Russia, Turkey and Mexico urbanisation levels have a significant impact on logistics structures. (PwC T&L 2030, 2011; PwC World 2050, 2011) Urbanization makes transportation structure more complex. There is a trend in emerging economies rural areas are turning urban area so urban logistic and social logistic may be new issue. (PwC T&L 2030 vol 2 2011)

(21) Level of consumption

Increasing consumption is the trend in emerging markets middle class. In order to manage increasing consumption and make it more sustainable, the EU has already announced an objective to “promote sustainable consumption and production patterns (SCP)” (Cited in PwC T&L 2030, Vol 3, 2011). Consumers have the same consumption decisions which are primarily price driven, they have not changed it over the past two decades. Sustainable and/or environmentally friendly products have still represented niche market. There is possibility for new regulation to increase sustainable and environmentally consumption in both emerging and western world. (PwC T&L 2030 Vol1, 2011)

(22) Mega cities

Since the 1950s, urbanization has increased rapidly. It is still growing. In 2007 more people started to live in urban areas than rural areas. The number of cities with more than 5 million is expected to increase from 49 in to 75 in 2020. It will bring some opportunities and threats. Especially in Asia and Africa megacities may cause transportation problem such as massive traffic jam. Lack of transportation infrastructure will be problem as well (Deutsche post, 2010). Increasing urbanization and mega cities may cause collaboration and co-opetition to manage big cities and provide delivery solutions. However, it is very hard to predict future role and number of megacities (PwC T&L 2030). Figure 4.26 shows prediction of Deutsche post (2010)

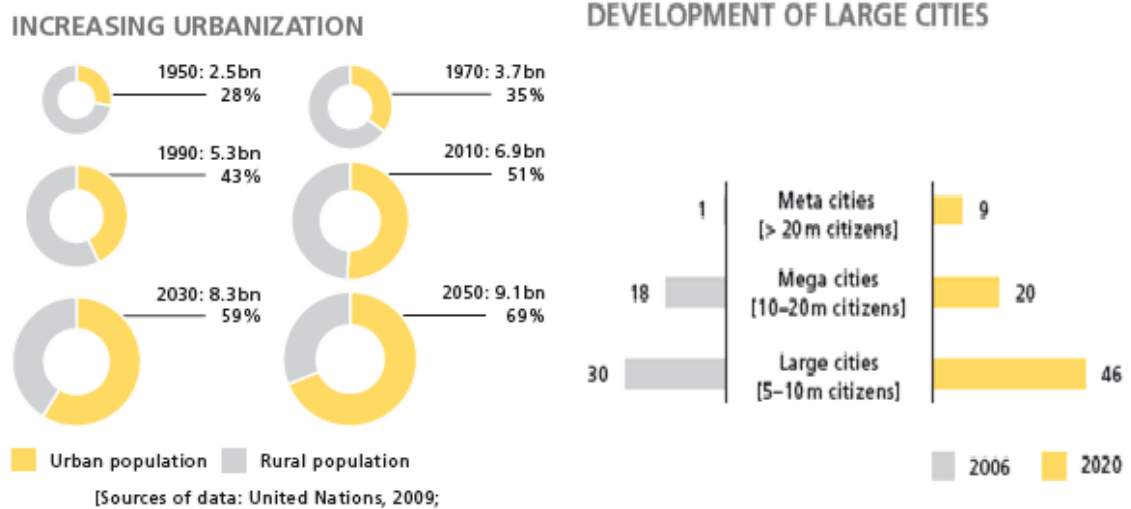


Figure 4.26 Urbanization and Large cities (Deutsche Post 2010)

(23) Nationalism

After the global crisis in 2008 show us, Changes in the world may lead to change the way of governments and make it more nationalistic. (BBC, 2011) Furthermore Spain and Catalonia and Belgium language problem may be another example of nationalism (BBC, 2009 and Telegraph, 2008). These trends may affect the way of logistic and increase local responsiveness.

(24) Social stress

Globalisation increased the gap between less developed and developed countries. It creates lose of social cohesion. Furthermore, demonstration will be diffused easily due to the coverage of social media. (Deutsche Post, 2009 and Deutsche Post, 2010) This situation may shape all sectors but it is uncertain.

(25) Demographic differences (Age)

Logistic industry is intermediary between consumers and producers. Every country has different demographic situation and age profile is still changing. It affects consumption profile and route of logistics. Nowadays statistics shows that, emerging country middle class population is getting bigger than developed nations population. These demographic shifts will changed the consumption profile and industrialised countries. Western world will increasingly suffer from a shortage of skilled workers. Furthermore, consumer profile will shift western countries to emerging economies (PwC T&L 2030 vol 3, 2011).

Technological

(26) Nanotechnology

Nanotechnology will be one of the key technologies of the 21st century which combine knowledge in many disciplines (PwC, 2011). It has the potential impact on wide range of processes especially textile sector, electronic and optical industry and health care. Nanotechnology may help create innovation to create new types of chemicals to water-proof textiles or wrinkle-reducing cosmetics. Moreover manufacturing at this ultra-small scale allows for the small need of raw material and reduce transportation cost. These new materials could have a significant impact on future supply chains. Furthermore, nanotechnology helps packaging standards and reduces environmental effect (PwC, 2011). This may help improve the cost profile of transporting. Nanotechnology may also help to reduce fuel consumption; some researchers believe that nanotechnology will increase communication. Overall, Nanotechnology may play a big role in supply chain (PwC vol 2, 2011).

(27) Cyber terrorism

Cyber terrorism is the combination of terrorism and cyberspace, which is the attack against computers, networks, databases to gather useful information to gain competitive advantage (Aldrick, 2008). Logistic industry has information about companies and logistic company and SCM need to gather more information about them to manage their network. Therefore, cyber terrorism threat may affect sector (PwC T&L 2030 Vol 4. 2011).

(28) Impact of new IT systems

There have been already improvements in IT and there is still significant further investment to improve it. Some experts are extremely expected potential IT improvement which will affect sector likewise internet did in the past (PwC T&L 2030 vol 1, 2011). Supply chain technology specifically helps to tracking and supply chain visibility. Moreover helps to information sharing, security. For example, global positioning systems (GPS) and radio frequency identification (RFID) helps to determine place of shipment. New technology may shape industry again, it may create new cost pool (PwC T&L 2030 Vol 4. 2011).

(29) Level of Commoditization

The logistics industry has growth rapidly. SCM and Logistics Companies affected by small margins due to commoditization. Moreover, decreasing in service life cycle leads

same service offerings in the sector (Manatayev, 2004). The sector is looking for new solutions via innovation and differentiation but institutional pressures make new solutions commodity product.

(30) Development of energy solutions

Oil price volatility is a risk for the sector. Increasing oil prices are one of the drivers of the change. Alternative energy may take place in the energy market. However according to PwC (2011) “experts do not foresee a major energy shifts by 2030, they expect to see notable growth in renewable energies.” New regulation is being set in a growing number of countries that let some technological change in new energy solutions area. Companies are looking for a solution to differentiate them and using environmentally friendly things will help to be different (PwC, 2011). Nowadays especially TNT is providing electrical truck in the carrier service to distribute it (TNT, 2011).

(31) Space Transportation

According to Logistics (2009), space logistic may be new part of the logistics system. Companies may provide space stations and space hotels. It may create new opportunity for future. But it will take time to be happened.

Environmental

(32) Level of sustainability

While current and future regulations have an important impact on the logistics industry, these regulations let company to use more sustainable supply chains and help to reduce environmental effects. This regulation may shape the way of sustainable business and sustainable supply chain (AT Kearney, 2010) (PwC T&L 2030 Vol 4. 2011).

(33) Level of emission rate and co2 footprint

According to PwC T&L report (2011) “reducing emissions is greater challenge to Logistics companies over the next 20 years than obtaining a sufficient supply of energy.” The cost of carbon emission may be one of the main operational costs. The carbon footprint may be tracked to monitor performance of the company.

(34) Regulation in Environmental

Regulation is one of the main reasons for the commoditisation. Especially in the emerging markets have begun to change their regulation and try to adapt new global world. Therefore, the economy has shifted from state-owned to a mixed economy. Regulations need some technological adaptation. Companies will need to understand how the

regulation in each market, will affect them. Moreover they need to understand customs and procedures (PwC, 2011; AT Kearney, 2010). Nowadays there is an increasing trend on environment. And governments changed their regulation to protect nature of the world. Level of this regulation move is uncertain.

(35) Level of climate change

National and local governments are increasingly trying to overcome climate change and its effects by “green” solutions. There is increasing trends on Climate change and international agreements such as Kyoto makes it more important (PwC, 2011). Although, customers purchasing decision depends on money, sustainable business and greener product take importance nowadays. This increase may let company and customer to change their purchasing behaviours. Logistics companies should give importance for climate change and make their network more environmentally conscious. Climate change and CO2 emissions will continue to be important and consumers may think environment and climate change when purchase something (PwC, 2011; Deutsche Post, 2010).

Other factor

(36) Fair of Terrorism

Terrorism has affected politic, economic and social condition of many countries. After the 9/11, USA and world economy have a fair on the terrorism. The terrorism changed the route of transportation. Especially the Middle East was affected by terrorism. The terror has an enormous effect on way of business and it brings some uncertainty and possibility to third world war.

(37) Molecular Transportation

Molecular transportation may be the new way of transportation. It may change everything in transportation. But scientists are still working on it.

Certainties

After the uncertainties, certainties help to explore scenarios and create opportunity and threats. General certainties are;

(38) Big Global world

World economy will be larger due to increasing number of global firms. Moreover, technological improvements help globalisation and make it bigger. Globalisation lets countries to create new economic middle-class. But it causes environmental and ethical issues.

(39) Universal Data Access

Internet and mobile phone are one of the innovative technological breakthroughs in the 20th century. These two technologies are combining together and increase visibility in these days. Internet and communication changed the way of business and it may bring new opportunities such as social media. Now it is very easy to communicate million of people by just one click. In the future it will enlarge.

(40) Resource constraints

According to experts world population will be 7-9 billion. Therefore, demanding and consuming of natural resources will be main issue in the future. Changing demand will result in supply and demand gaps; Countries will no longer be concerned just about energy scarcity but also about general resource scarcity. It will increase the reverse logistics.

4.2.4 Identifying factor ranges

Tapinos (2009) suggested reduction of factors from 40 to 12 and recommend choose the most important and uncertain ones. It helps to manage the uncertainty and get plausible image. In order to do it, factors are placed on two axis grid. The first axis shows level of uncertainty and the second one shows level of importance (Figure 4.27).

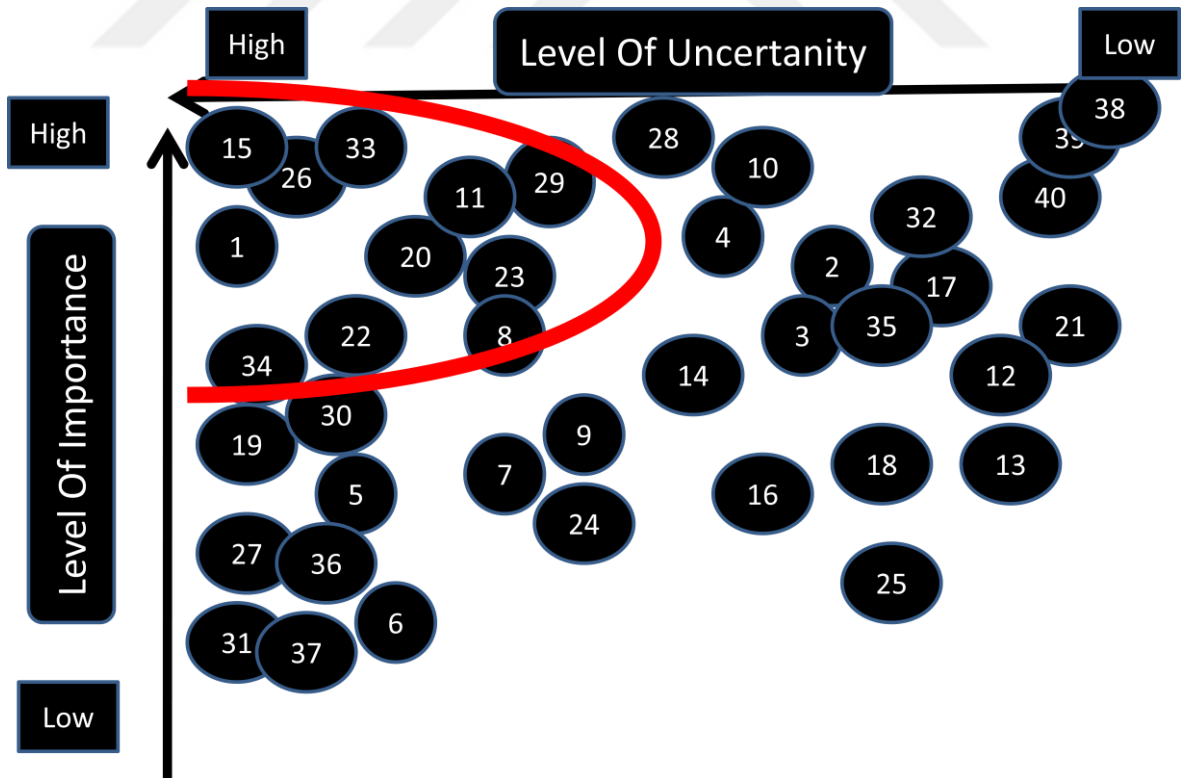


Figure 4.27 Uncertainty importance matrix

According to this Figure, the most important ones are shown in Table 4.7 with their range of possibilities.

Factors	Range of Possibilities
(15) Crude oil/fuel price fluctuation	\$75/barrel to \$300/barrel
(26) NanoTechnology	Yes - partly yes - no
(33) Level of emission rate and co2 footprint	High medium low
(1) Government expenditure trend on transportation infrastructure	Private – partly governmental – governmental
(34) Regulation in Environmental	Higly regulated – regulated
(22) Mega cities	100 to 20
(20) Level of Urbanization	%80 urbanization to %50 urbanization
(11) New routes and logistic countries	New routes – old routes
(29) Level of Commoditization	High – low
(23) Nationalism	High – low
(8) Consolidation in emerging economies	Higly consolidation low consolidation

Table 4.7 Most important uncertainties and their range of possibilities

According to Tapinos (2009) “The importance of the factors to the company would be examined with respect to its relevance on the forces of competition and competences.” In Schenker case, four out of eleven factors are the most important ones which are oil price fluctuations, nanotechnology, emission rate and trends in infrastructure expenditure. However other factors in Table 4.7 are important.

PwC Transportation and Logistics 2030 report (2011) use Delphi method to present future of logistic. They asked question about oil price. PwC paper focused on worst case scenario and estimate oil price will be 1000\$/Barrel. However according to Delphi experts this is less possible situation. According to energy information administration the oil price would reach \$200 in 2030 but it is hard to predict exact price (PwC T&L 2030, 2011). Therefore, this paper used the range of \$75 to \$300.

Nanotechnology and other technological development may shape all sector. It has potential impact on all industries. It will help material handling, information management, energy and safety. It will change the way of logistics, products will be smaller and lighter. Therefore, logistics needs will decline. On the other hand, nano technology will help logistics operations, for example logistics company would start using lightweight containers which used nano composite plastics, shock-absorbing materials which helps to absorb material in just a second, self-signalling containers and smart materials These improvements would reduce logistics cost, But these are still assumptions and it is still uncertain. (Simonis and Schilthuizen, 2006) On the scenario themes will look nanotechnology will be exist or not.

CO2 emissions and carbon footprint is one of the key issue in the logistic sector, it affects so many aspect of logistics, especially consumer preferences, governments and supplier selection. According to AT Kearney (2010) and PwC (2011), CO2 emission tracking will be new issue. In order to reduce CO2 emission, alternative energy may be solution. But the level of the alternative energy and consumer trends are uncertain. Scenario themes are looking for the trend of CO2 emissions is it increasing or not?

Transportation and logistics quality depends on infrastructure. Although, western countries need to focus on maintenance their old infrastructure, developing countries need to solve their infrastructure problem. The main question is how to fund it. Scenarios focus on governmental, private or mutual funding.

Regulation in the environment is key issue, and it is uncertain due to the environmental concern and international agreements such as KYOTO protocol. Furthermore, continuous discussion about release of the green house gases, CO2 emission, courage to governments and international associations to regulate it. (Deutsche Post, 2010) The regulation of environment can be either high or low on the scenarios.

Urbanization and mega cities may be new opportunity for future logistics due to increasing population in urban area. It may create new mega cities. According to Deutsche Post (2010) number of megacities will reach 75 in 2020 (46 in 2010). Number and role of megacities will be uncertain. On scenarios, urbanization can be in between 50 to 80 percent. Megacities can be 100 or 20.

Role of logistics and routes may change due to changing manufacturing and consumption patterns. Especially E7 countries may be the new route and logistics hub. In these days main hub is central Europe and Southeast Asia. New route and logistic countries

can exist or it will be the same old route.

Logistics service is getting commoditized due to the same service offerings. Therefore scenario themes focused on level of commoditisation and its affect can be high or low. Moreover the same service offering causes consolidation in logistics service. According to AT Kearney China 2015 (2010) report, china and other emerging markets logistics sector is getting closer to consolidation. Therefore, consolidation can be high and low.

Nationalism and decentralization are another key issue, Yugoslavia, India faced decentralisation. Nowadays, Spain, Belgium and Turkey faced nationalism and decentralisation pressure. It may shape sector and it will bring new regulation and uncertainties. Nationalism effect can be shown on scenarios more national or more global.

4.2.5 Scenario theme

Tapinos (2009) suggested that after the analysis and identifying the uncertainties, determine the themes of scenarios and give details of them. This paper followed Tapinos (2009) suggestion. Tapinos (2009) argues that it is necessary to create three scenarios which based on different factors. This paper provides three scenarios which are independently represent different factors. (Tapinos 2009, O'Brien 2004) These scenarios based main uncertainties.

First theme is chosen to represent technological changes and its impact on Schenker. Name of it is "*Nano World*" which represents technological challenge and its effects on logistics and supply chain industry. This scenario also represent new route and new player in the sector, "*Nano world*" create a differentiation opportunity to reduce commoditisation. However, it leads to consolidation and merger/acquisitions.

Second theme of the scenario planning has been chosen "*Urban and social life*" due to the increasing population in city and its effects on social life. This scenario shows the role of emerging economies and megacities. Urban life brings some opportunities and threats.

Third scenario theme is "*regulated world*" political and economical instability cause more institutional pressure and new regulation. Furthermore, globalization and its effects lead country and company to create new regulation to reduce its risk. All of these three scenarios depend on one main uncertainty "*oil and energy dependency*".

Table 4.8, 4.9, 4.10 show three scenarios effects on first business environment, then micro environment and on Schenker.

Factors	NanoWorld	Urban and Social Life	Regulated World	Comments
Crude oil/fuel price fluctuation	\$75	\$200	\$300	Oil price is extremely volatile and possible oil shortage affects all industry and let government to regulation
Nano Technology	Yes	Partly yes	No	Nanotechnology bring some opportunity and thread and new shape on logistic industry, products become smaller, packaging will be lighter. First scenario depends on nano technology in general and cover technological change, second one include partly technological challenge.
Level of emission rate and co2 footprint	Low	High	Medium	CO2 emission is on of the performance criteria for logistic companies. But it depends on energy sources, first scenario will provide technological solution and it will reduce dispatch frequency. IN second scenario, social and urban logistic will increase dispatch frequency and it will cause increasing in emission rate third scenario regulative environment tries to reduce CO2 emission
Government expenditure trend on transportation infrastructure	Private	Both	Governmenta 1	Infrastructure is basic needs for Logistics company, and nowadays it is provided by government. However some of project is funded by private funds. First scenario depends on technology and infrastructure will be provided by private due to opportunity. Second

Table 4.8 Scenario effects on business environment.

Micro Industry	Nano World	Urban and social Life	Regulated world	Notes
Threats of new entrants	Moderate	Mod- High	Low	Logistics industry is capital and network intensive sector. Therefore, new entrants must be low. However Nanoworld and urban and social life will create new markets. Therefore, new entrants may be moderate and high
Bargaining Power of suppliers	High	High	Low- Mod	Nano world and urban and social life will bring new opportunity so new suppliers will arise. Freight sup(ship, truck, infrastructure) and oil suppliers have high bargaining power. Therefore, first two scenarios have high supplier power. Regulated world scenario has more regulation than other scenarios so it will reduce the bargaining power of suppliers.
Bargaining Power of buyers	Moderate	High	High	Buyers have high bargaining due to commoditisation and competition however nano world scenario will provide different offering so it will reduce the bargaining power of buyers
Threat of substitutes	high	low	Low	In freight forwarder and logistic industry, freight forwarders provide all type of distribution so there is not any threat from substitute. However Nano World will provide new type of service offering. Therefore, existing service and new service will be substitute.
Competitive Rivalry	Low	High	High	Due to the market structure (commoditization) and competitiveness in market cause always high competitive rivalry

Table 4.9 Scenarios effects on Micro environment.

	Nano World				Urban and Social Life				Regulated World				V: Value; R: Rarity; I: Inimitability; S: Substitutability Red: Negative Yellow Neutral Green Positive
	V	R	I	S	V	R	I	S	V	R	I	S	
Rail freight infrastructure management													Schenker's main competences arises from rail Infrastructure but it has substitutability problem.
Integrated Capability													This is the main competences for all scenarios. However regulation makes all companies same.
Networking													Networking is also very crucial competences but it is not rare
Process Management													Process management is big competences for today but in these three scenario, process management will be key issue and it wont be rare and

Table 4.10 Scenarios effects on Schenker

4.2.6 Checking internal consistency

Scenarios must be internally consistent, cross impact matrix was applied to check consistency. Cross impact matrix compares relationship and correlation between uncertainty factors (Table 4.11). S represents strong, M represents Medium W represents Weak relations. 0 represents there is not any relation. “+” represents positive relations,”-“represents negative relations.

	1	2	3	4	5	6	7	8	9	10	11
1. Crude oil/fuel price fluctuation		0	0	W+	M+	0	W-	W-	S+	M+	M+
2. NanoTechnology			S-	M-	W-	M-	M-	M-	M+	W-	W-
3. Level of emission rate and co2 footprint				M+	M+	M+	M+	M+	M+	L-	M+
4. Government expenditure trend on transportation infrastructure					M+	M+	M+	M+	W+	S+	M+
5. Regulation in Environmental						W+	S+	W-	S+	S+	S+
6. Mega cities in BRIC							S+	S+	W+	M+	S+
7. Level of Urbanization								S+	M+	M+	S+
8. New routes and logistic countries									S+	M+	M+
9. Level of Commoditization										M+	M+
10. Nationalism											M+
11. Consolidation in emerging economies											

Table 4.11 Cross impact analysis for internal consistency.

According to this matrix all of these uncertainty factors are consistently related.

4.2.7 Presenting scenarios

Bunn and Salo (1993) mentioned six main aspects of scenario presentations, audience, purpose, name, content of the narrative, language and finally genre of narratives. Audience of these scenarios can be anyone who is interested in, especially the industry analyst. Purpose of this paper is providing plausible future and strategies for Schenker. Name of the scenarios are “*Nano world, Urban and social life, regulated world*” which were chosen due to uncertainty factors. Content of scenario is trying to represent possible future. For language, present form used instead of the future form due to possibility of being wrong. As genre of narratives, this paper chose short story.

- **Nano world 2030:** After the tremendous change in technology, Nanotechnology arose. Nanotechnology brings key technological benefit for business processes in almost every sectors especially packaging industry, textile sector, electronic and optical industry, health care and energy. Therefore oil prices have been stable due to common alternative energies. Energy prices are not most important operational cost pool for logistics companies anymore. Nanotechnology has dramatically improved many processes in logistics such as innovative transportation, maintenance and services. Nanotechnology gets product smaller and it reduces dispatch frequency. Therefore, CO2 emission reduces. Regulation on environment is not also big issue due to technological improvement. Nanotechnology shapes all sectors and creates new opportunity so private companies try to use this opportunity by providing infrastructure. Nanotechnology and other technological changes create new opportunity but western world uses this opportunity due to their competences on research. Furthermore, it leads consolidation in western world to provide new innovative service. Other technological changes such as Three-dimensional printing (rapid prototyping, fabbing) have minimized urbanization needs because customers can produce their items at home or small factories can produce their spare parts.
- **Urban and Social Life 2030:** Mega cities reach 100 and urbanization rate reaches 80% Modern urbanization changes the people needs, logistic provider responses new city living needs such as intercity solutions, increasing dispatch frequency, urban mining, reverse logistics, slow transportation. Mega cities and urbanization increase in emerging economies Asia and Africa so new routes and countries become dominant player in logistics industry. However, consolidation increases in emerging economies and western world due to the need of extra inter city solutions and services. Oil price reaches 200\$/barrel. Alternative energy is not common and not enough to reduce oil prices therefore oil prices doubled. Increasing dispatch frequency and inter city transportation cause increasing in CO2 emission. Urban and social life brings some niche market and logistics solutions such as urban mining (reverse logistics), low cost logistics, home delivery specialist and local management.
- **Regulated world 2030:** Logistics service providers faced with strong oil prices volatility. Oil price reaches 300\$/barrel. Alternative energies are still not common. Furthermore, high energy prices cause changing in transportation modes, rail, sea and inter modal transport importance have increased. Regulative

environment tries to reduce oil prices and regulate sectors. Therefore, government and organization spend money on infrastructure rather than private companies. Emission rate is stable due to regulations. New regulation affects every world but dominant players of the logistics sectors do not change. Regulation increases commoditization and consolidation in western countries. Governmental actions and regulations are promoting sustainable consumption.

4.2.8 Assessing impact of scenarios

After the first seven stages, Scenario themes were developed. In order to develop strategy, opportunities and threats of scenarios can be useful. Moreover, strengths and weaknesses of Schenker help for next stages. Strengths and weaknesses based on current situation (Table 4.12). Opportunities and threats depended on different scenarios. (Table 4.13)

Strengths	Weaknesses
<ul style="list-style-type: none"> • Rail freight infrastructure • Good networking • Future based management system • Synergy • Customer based management system. • Industry specific solutions • Integration ability • Financial stability • International coverage 	<ul style="list-style-type: none"> • Commoditization reduce margin • Pressures from stakeholder • Supplier dependency • Less differentiation • Risk from management due to international coverage • Lack of domestic networking.

Table 4.12 Schenker’s Strengths and Weaknesses.

Nano World	
Opportunity	Threats
<ul style="list-style-type: none"> • Create new blue ocean markets(niche markts) • Technological Efficiency • Alternative energy and stable oil price • Fabbing and High tech logistics • Increase infrastructure quality 	<ul style="list-style-type: none"> • Re-regulation • Consolidation in western country • New sectors bring new organizational learning needs • Increasing infrastructure cost • New entrants

Urban And Social Life	
Opportunity	Threats
<ul style="list-style-type: none"> • City management • New country and diversification opportunity • New niche market and special solutions market (urban mining, low cost delivery, home delivery Urban freight IT) • 4PL 	<ul style="list-style-type: none"> • Parcel companies have first mover advantage • Consolidation • Increasing nationalism • Re-regulation on Environment • Oil price

Regulated World	
Opportunity	Threats
<ul style="list-style-type: none"> • Efficiency • Sea and rail freight • Intermodal transportation • Reverse logistics • Eco consultancy • Slow transportation (Critical success factor is environment rather than speed) • Logistics consultancy 	<ul style="list-style-type: none"> • Commoditization • Oil price • Competition

Table 4.13 Opportunities for different scenarios.

Schenker's strengths arise from its experiences and owner Deutsche Bahn. Rail freight infrastructure and synergy help to provide industry specific solutions and international coverage. Integration ability helps company to combine Schenker's business units. Schenker needs to manage its global network. Therefore communication and managing global network are hard and costly. One of the other weaknesses is commoditisation and it reduces company's margin. Lack of domestic network is another weakness.

Opportunities for Schenker are different scenario by scenario. Nano world may provide technology based opportunity such as fabbing (personal fabrication) and technological efficiency. Urban and social life is providing city based opportunity, such as eco city management, eco consultancy, and city distributions. Regulated world brings regulation based opportunity such as intermodal transportation and rail/ocean freight. Threats for Schenker are consolidation, commoditisation and oil price but every scenario includes some different threats such as for Nano world, new entrants, for urban and social life, nationalism and parcel companies, for regulated world, competition may be threats.

4.2.9 Generating and testing strategies

In order to develop strategy, TOWS matrix is useful. This matrix provides options which are based on company's strengths to capitalise on opportunities and/or acquire strengths in order to capture opportunities or overcome threats and minimise its weaknesses. (Hill and Westbrook, 1997) Table 4.14 provides TOWS matrix for Schenker.

	<p>Opportunities (O)</p> <ul style="list-style-type: none"> • Create new blue ocean markets(Niche Markets)/ Fabbing/High tech logistics • Efficiency/Alternative energy and stable oil price /Increase infrastructure quality • City management • New country and diversification opportunity • 4PL/Sea and rail freight /Intermodal transportation 	<p>Threats (T)</p> <ul style="list-style-type: none"> • Re-regulation • New organizational learning needs /New entrants • Increasing infrastructure/oil cost • Parcel companies have first mover advantage/ Consolidation/competition • Increasing nationalism
<p>Strengths (S)</p> <ul style="list-style-type: none"> • Rail freight infrastructure • Good networking • Future based management system • Synergy • Customer based management system. • Industry specific solutions • Integration ability 	<p>(SO)</p> <ul style="list-style-type: none"> • Special sector solution • Technology based Logistics management • Consultancy and define new 4PL (5PL) 	<p>(ST)</p> <ul style="list-style-type: none"> • Organisational learning by Collobaration/co-opetition and reduce risk

<ul style="list-style-type: none"> • Financial stability • International coverage 		
<p>Weaknesses (W)</p> <ul style="list-style-type: none"> • Commoditization reduce margin • Pressures from stakeholder • Supplier dependency • Less differentiation • Risk from management due to international coverage • Lack of domestic networking. 	<p>(WO)</p> <ul style="list-style-type: none"> • Create niche market and increase margin • New markets and increase new markets share in turnover • Parcel/Courier logistics service/ City management 	<p>(WT)</p> <ul style="list-style-type: none"> • Hedging supplier risk and operation cost • Leave non profit countries.

Table 4.14 TOWS Matrix

Strategies suggested to Schenker, can be divided four main subtitles, SO, ST, WO, WT.

SO Strategies

Internal strengths combined with external opportunities it is the ideal form of strategy.

- **Special sector solution:** Providing special sector solutions is product differentiation according to Ansoff Product/market grid. It would help Schenker to increase their market share and differentiate its reputation and brand identity. Especially new sectors such as E-business (E-cluster and E- marketplace solutions), Chemical industry (Chemical transportation solutions) and Gas/oil transportation (Pipeline management) which are looking for specific solutions.
- **Technology based Logistic management:** Technology would provide niche market opportunity and infrastructural development. Such as Fabbing supply chain (personal fabrication of products via home computer or small entrepreneur, consumers could create simple pieces of merchandise or replacement parts on a 3D printer.) In order to adapt future changes Schenker may apply sky transportation (Product can be carried city centre to outside of the city by sky train, it will also help for space logistics infrastructure) and underground logistics which is canal, train or road system in underground to distribute inter city without causing any traffic congestion. In order to increase infrastructure efficiency Schenker would focus on infrastructure management especially Schenker can use attachable infrastructure (Infrastructure system which can be reuse in another area).
- **Consultancy and Define new 4PL (5PL):** Schenker can use its experience to provide consultancy service to its clients. It is also product development according to Ansoff product market grid. It will help the company to gain new customer and increase revenue. 4PL is just providing coordination and management of delivery or supply networks to achieve efficiency. However 5PL would provide fragmented service and niche based solutions and not just for the big players but also small companies or individuals.

ST Strategies

Internal strengths combined with external threats, companies need to consider organisational learning to adapt change or acquire new strengths to overcome threats.

- **Organisational learning by Collaboration/co-opetition and reduce risk:** In order to reduce cost and increase adaptation, collaboration and co-opetition would be useful. Collaboration and co-opetition help Schenker to share cost and overcome regulation barriers. Moreover, co-opetition would be useful for fragmented service offering such as intercity distributions.

WO Strategies

Internal weaknesses combined with external opportunities. It is looking for overcoming weaknesses by effectiveness and acquiring internal capability and strengths.

- **Create niche market and increase margin:** Niche market would be preferable by companies due to premium price and less competition. The Logistic industry is getting more consolidated. Therefore, acting in a niche market would provide stable margin. Marina logistics, hotel logistics, tourism logistics, demand driven chain management (CRM based demand management and customer pull based logistics management system) may be niche market for Schenker.
- **New markets and increase new markets share:** E7 countries especially China as a producer and a consumer, Turkey and Russia as a bridge are getting more important and brings more opportunity.
- **Parcel/Courier logistics service/City management:** Intercity distribution would help Schenker's market position and its reputation. Moreover, it creates new service offering for Schenker.

WT Strategies

Internal weaknesses combined with external threats, this is the worst case scenario. Therefore, companies need to find a solution by radical changes.

- **Hedging supplier risk and operation cost:** In order to reduce risk of oil price and overall operation cost, hedging would be solution for Schenker. Schenker would increase supplier relationship to reduce bargaining power of suppliers.
- **Leave non-profit countries:** Some countries may not generate enough revenue and it causes loses, in order to balance revenue, Schenker can leave some country operations.

In order to test strategy, FAS (Feasibility, Acceptability, Suitability) framework was applied which was suggested by Tapinos (2009). (Johnson et al 2008) Suitability

assesses company's capability and stakeholder influence in the business environment for specific strategy options. Acceptability assesses potential benefits and risk of strategical options and potential stakeholder reaction. Feasibility assesses coherence of strategical options with financial requirements and a resource deployment. In order to test strategy this paper gave mark out of five to show most applicable strategies. (Table 4.15)

	Nano World			Urban and Social Life			Regulated World			Robust
	F	A	S	F	A	S	F	A	S	
• Special sector solution	5	5	5	5	4	4	4	4	4	40
• Technology based Logistic management	5	5	5	4	4	5	4	4	4	40
• Consultancy and find after 4PL(5PL)	4	5	5	5	5	5	4	5	5	43
• Organisational learning by Collaboration / co-opetition	5	5	5	4	5	5	4	4	5	42
• Create niche market and increase magrin	5	5	5	5	5	5	2	2	2	36
New markets and increase new markets share	4	4	4	5	5	5	3	3	3	36
• Parcel/Courier logistics service/ City management	5	5	4	5	5	5	3	3	3	38
• Hedging supplier risk and operation cost	3	3	3	4	4	4	5	5	5	36
• Leave non profit countries	4	4	3	3	3	3	4	4	4	32

Table 4.15 Robustness of the strategic options.

According to robustness of the strategic options table, four out of nine strategical options got 40 or more than 40 overall 45. These four strategies are the best recommended strategies for Schenker.

These are;

- **Special sector solution**
- **Technology based Logistic management**
- **Consultancy and find after 4PL(5PL)**
- **Organisational learning by Collaboration / co-opetition**

4.2.10 Picturing competitor position and competences in scenarios

This part added to Tapinos (2009) approaches to see main competitors position in particular strategies. As this paper mentioned in early sections DHL, CEVA and Kuehne Nagel are the main rivals of Schenker. This part is looking for competitor potential response when Schenker apply suggested strategies. This part depends on chapter 4.2.2 (**Analysis of main competitor and stakeholders**).

- **Special sector solution:** When Schenker starts offering special solutions, Kuehne Nagel (KHN) and DHL would response quickly or DHL and KHN may be first mover in the special solution market. When Schenker provides E-business solutions (E-cluster and E- marketplace solutions), DHL would response due to its future strategy which depends on providing e business solutions. When Schenker offers Chemical industry solutions and Gas and oil transportation (Pipeline management) KHN would response quickly due to its future strategy (being niche) (refer to figure 4.19 and 4.21)
- **Technology based Logistic management:** When Schenker provides Technology based solutions such as Fabbing supply chain, sky transportation and underground logistics, all of three main rivals would response. Because these solutions will be new directions for sector. Attachable infrastructure would need collaboration between DHL CEVA KHN and Schenker.
- **Consultancy and find after 4PL (5PL):** Schenker and others can use its experience to provide consultancy service to its clients. It will be new competition area. However, CEVA logistics has early mover advantages (CEVA, 2011). DHL is the creator of 4PL it means DHL would be main rival for creating the 5PL.
- **Organisational learning by Collaboration/Co-opetition and reduce risk:** Collaboration and co-opetition lead these four rivals to share information and overcome same barriers.

Chapter 5: Discussion

This paper provides practical scenario planning to answer “Which strategies will DB Schenker AG have to focus on for 2030 to keep and increase their customer confidence and shareholder value in an uncertain future environment?”

It is obvious that business environment is uncertain and everything can change. “Scenario planning is a technique that help us to cope with that uncertainty” (Lekeas, 1999). It provides framework of plausible futures and possible strategies for futures. Scenario planning is getting more common for the companies especially strategic planning practitioners prefer it. However, there is still space for scenario planning to expand as a method to be widely accepted. According to survey which was conducted by Jarzabkowski and Giulietti (2007) which is about strategy tools, the scenario planning was currently used by 45% of the participant and just 7% of participants have never heard of it. Although practitioners are mainly using scenario planning, scenario planning is not common in text book of strategic management literature. According to Tapinos (2009) research, 6 out of 11 text books mentioned scenario planning (Hill and Jones 2008, Dess et al 2008, Mcgee et al 2005, Johnson et al 2008, Grant 2007, De Wit and Meyer 2004) and just three of them explained process (et al 2008, Johnson et al 2008, de wit and Meyer 2004). Scenario planning is about strategising and it needs real case of company. In order to apply scenario planning, different analyses are needed to apply such as macro, micro and company based. Furthermore, There are many methodology can use for scenario planning which often use same stage but sometimes contrast with each other. These two reasons make scenario planning complicated. Therefore, maybe text books don't mention about it and its process.

Scenario planning is all about strategizing and overcoming uncertainties, hence, there are different approaches and schools. The first approach is an intuitive logic which is based on the external factors influencing on the key decision factors. (Tapinos, 2009) Second approach is trend-impact analysis which is using forecasting techniques with qualitative factors. It is more company based analysis and uncertainties come from micro analysis. Third one is the cross-impact method which is looking inter relationships between variables which may affect future of organisation. Overall, all of these three schools aim to combine proper strategic tools to reflect plausible future. This paper follows intuitive logic school which gives importance on strategy making. Some of the main contributors on literature are, Wack, 1985; Schoemaker , 1995; Schwartz, 1996; Van de Heijen, 1996, Van notten et al 2003, O'brien 2004, Chermack 2004 and Tapinos 2009.

This paper applied Tapinos (2009) eight stages methods to make strategy for DB Schenker AG. In order to adapt this method for logistics industry, this paper added two more stages to reflect competitor's role and possible response profile. Three scenarios were created based on 20 years to reflect 2030 for Schenker and logistics industry which are; "Nano world, urban and social life and regulated world." According to analysis, sectors would affect by regulation pressures, technological changes, competition, oil price and commoditisation. Sector faced changes about these factors in the past and for future these are still uncertainties. Additionally urbanisation, megacities, infrastructure and increasing nationalism are the new uncertainties for logistics sector. Manager needs to think these uncertainties and future possibilities. Especially new uncertainties bring new risk factors for manager they can shape all sector and needs radical decision. Especially three of factors may bring big changes for logistic sectors they are, mega cities, technological changes and infrastructure management. For instance, mega cities and increasing urbanisation may bring new needs such as intercity transportation so Schenker needs to provide this service via merger/acquisition, internal development or alliances. On the other hand technology may bring big challenge it will be new cost pool and it brings new adaptation process for Schenker. This technological change may be nanotechnology, space logistics or fabbing. According to researches (PwC 2011; AT Kearney 2010; Deutsche Post, 2009 and 2010) infrastructure management may be another big challenge for manager. Especially western countries needs to maintain their old structure it will take times and it will be costly. Governments may try to share their cost with private companies and it will create new supplier (stakeholder) for Schenker and other logistic companies. Schenker and other logistics companies need to adapt these kinds of radical changes.

Scenarios based on these factors. In order to keep and increase their customer confidence and shareholder value in uncertain future, this paper created strategies for Schenker and chose most appropriate ones.

These strategies are:

- Special sector solution
- Technology based Logistic management
- Consultancy and find after 4PL(5PL)
- Organisational learning by Collaboration / co-opetition.

These uncertainties, scenarios and strategies would provide future picture for Schenker, which help to improve its position and prepare for radical changes. In order to

prepare to changes Schenker needs to use its competences, create/acquire new competences and control its competitors. Schenker's main competences arise from its experience. In order to be ready for radical changes Schenker needs to acquire new competences to maintain its position in the market. For examples, collaboration between TNT, environmentally conscious logistics service structure and consultancy based structure may be useful competences and resources for Schenker. Main rival of Schenker are DHL, CEVA and Kuehne Nagel due to their market share and international coverage. Three main competitors have different future directions. For examples DHL is looking for e business opportunity and Africa expansion, Kuehne Nagel is seeking new niche market opportunity and CEVA wants to be market leader in China and Ocean freight. Therefore, managers need to think about competitors move before giving future decision. In e-business DHL may be biggest rival, in niche markets such as chemical transportation, pipeline logistics or area logistics, Kuehne Nagel may be biggest rival or in Chinese and ocean freight market CEVA may be biggest rival. In order to reduce competitors pressures Managers would try to define new market like fragmented 4PL for small and medium size companies.

This paper has some different aspects comparably other related academic paper on logistics industry. Other papers focused on territories, general future of logistic or specific area such as carbon foot print. However, this paper conducted a research about specific company "DB Schenker AG" Gracht and Darkow (2010), PwC (2011), Deutsche Post (2009, 2010), AT Kearney (2010) and Deutsche Bahn (Logistics, 2009) conducted research on future of logistics. This paper is different from, Gracht and Darkow (2010), Deutsche Post (2009, 2010), AT Kearney (2010), due to strategising process and strategies. Those papers just mentioned about future possible changes and did not provide plausible strategies. However, Gracht and Darkow (2010) mentioned consolidation and parcel market likewise my paper. PwC (2011) and Deutsche Bahn (Logistics, 2009) results and recommendation nearly same with this paper, however, my paper provides more deeply strategies and possible competitor response.

Applying scenario planning on logistics company and sector is very efficient way of foreseeing future changes. It is useful because sector has some patterns but they are still uncertain. Scenario Planning helps to be ready for uncertainties. Moreover, logistics sector is in between companies and end users, therefore, sector needs to think about future and determine future changes to adapt it. Scenario planning can provide future uncertainties and help to adaptation. Additionally, Logistics companies needs to differentiate them due to commoditisation. Scenario planning can create plausible future options and companies

starts to think about plausible futures and differentiation opportunities. However, research faced certain methodological problem sometimes data becomes complex and scenario process was affected by complex data. This research depends on case study so study findings may be limited due to limitation of case study. Additionally, analyse of scenario planning in this research depends on practitioners experience; it may bring some wrong assumption about future. Overall, applying scenario planning on DB Schenker AG helped to see main potential changes in the logistics market and plausible futures. DB Schenker should think about megacities, technological changes and regulation pressures in order to protect and maintain their global position.



Chapter 6 Conclusion

This chapter provides conclusion for the research. This paper provided detail scenario planning study for DB Schenker AG. This paper used scenario planning to create scenarios and future strategies. Main aim of this paper was understand the theory and evolution of scenario planning and answer “Which strategies will DB Schenker AG have to focus on for 2030 to keep and increase their customer confidence and shareholder value in an uncertain future environment?”

In order to answer research question this paper followed Tapinos (2009) 8 stages approach and add two more stages to reflect competitors. 37 uncertainties and 3 certainties were generated regarding analysis of company, environment and competitors. In order to reflect main rivals strategic group analysis was applied. According to analysis DHL, CEVA and Kuehne Nagel are the main rivals of Schenker. Although Schenker and its rivals serve the same market their competences are different. Schenker’s main competences arise from its experiences and rail infrastructure; however DHL’s competences arise from its reputation, specialisation and intercity distribution network. CEVA’s competences arise from its wide range of solutions and container experiences. KHN’s competences arise from IT infrastructure and niche market. Therefore, rivals future strategies are different. DHL is looking to provide sector solution, increase IT infrastructure, provide special service to e-business and use route of Africa. However, CEVA is looking to expand its market share in freight market especially being a market leader in ocean freight and China. KHN is looking forward to create new niche markets and increase customer orientation. General trends in competitors, creating niche market and protect margin and give importance to customers.

11 out of 37 uncertainties were chosen as a high impact and created three scenarios to show three plausible futures. In order to generate scenario main uncertainties were used. They were regulation pressures, technological changes, competition, oil price, urbanization and commoditisation. Commoditisation brings uncertainty to logistics sectors, it increase competition and decrease profit margin. Regulation increases the speed of commoditisation. Oil price fluctuation reduces the margin. Three scenarios mainly cover these six uncertainties but they also touched nationalism, role of government, private funds on infrastructure and emerging economies consolidation. Three scenarios are “*Nano world, Urban and Social Life, Regulated world*”. Nano world depends on more technological changes and it lets companies to create differentiation opportunity and specific solutions such as nanotechnology, fabbing, pipeline, e-business and chemical solutions. Urban and Social life represented urbanization and megacities in the world.

Therefore, city logistics, low cost logistics, fragmented 4PL (5PL) and urban mining would be opportunity for sector. Regulated world represented more regulative world and oil crises, previous two scenario represent 75\$/barrel and 200\$/barrel but regulated world represents 300\$/barrel. Therefore cost of logistics increased and companies starts to looking efficiency by using sky transportation, attachable infrastructure and underground transportation. All of these infrastructural strategies need to support from governments. Three scenario needs co-opetition with rivals in order to reach efficiency and share cost.

In order to create strategies TOWS matrix was applied and created 9 strategies. After the robustness test, 4 out of 9 strategy were chosen which are “Special sector solution, Technology based Logistic management, Consultancy and define new 4PL (5PL) and Organisational learning by Collaboration/co-opetition. Special sector solution, technology based logistic management and consultancy strategies are looking for creating niche market and increase margin. Last one is looking for efficiency and adaptation.

Overall, this paper helps to understand uncertain world and recommended strategies would help Schenker to adapt uncertain world and gain competitive advantage over its competitors.

Chapter 7 References

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Definition of Terms

3PL: Third Party Company provides integrated operation of warehousing and transportation for companies.

4PL: is providing coordination and management of delivery or supply networks to achieve efficiency

5PL: Fragmented 4PL service which focuses on SME and tries to define their logistics network

Attachable Infrastructure: Infrastructure system which can be reuse in another area

Battlefield Analysis: is the combination of different kind of analysis to provide micro industry analysis. It tries to reflect market place which company compete in. It includes four main steps; first defining overall market by financial results and trends which help to see big picture. (Big Picture) Second step structure of market, main rivals and groups by Strategic group analysis (Main battlefield, and rivals). Third step is representing forces in the markets Last step focuses on company's objectives. (main objectives)

Bundling and unbundling: Combining or dividing product

Commoditisation: Transform of good to commodity

Consolidation: Join together to one whole in business companies generally using merger and acquisitions.

Co-opetition: Collaboration with competitors (sleep with enemies)

Cross docking: Unloading materials transfer inbound to outbound try to reduce handling

Customer pull based logistics management: It is kind of consultancy service which is providing customer needs to companies.

Cyclical Period Analysis: Cyclical period analysis depends on idea of *“Everything and everyone was affected by its past”* This analysis focuses on history of sectors and general trends.

Demand management: It is special solutions for retail industry to provide enough supply for their demand.

E-cluster: A group of company using the same e-marketplace.

Fabbing: Personal fabrication of products via home computer or small entrepreneur.

Freight Forwarder: Specialised firm which provides full range of logistics service.

Freight: Carriage and transportation fee.

Fulfilment logistic: Fulfilment logistics cover all core logistics activity by outsourcing.

Home Delivery Specialist: Kind of Parcel service but it is more professional and time oriented.

Kit: Assembly of parts by Logistics Company.

Labelling: Providing product labelling service.

Light assembly: Loading and unloading pallets via multilevel assembly line.

Local Management: Local area management is kind of parcel service providing special service for area retailers.

Logistics: Management of flow of goods.

Outsourcing: Working with outside suppliers.

Parcel Express Courier: Package transportation service.

Price tagging: Providing price tagging service.

Reconfiguration: Rearrangement of logistics settings.

Regulatory Compliance: Special service offering for companies which is using own logistics network to help their regulation requirements.

Reverse Logistics: All Logistics activity after the point of sales.

Sequencing Technical Inspection: Assembly line and transportation network control.

Sky Transportation: Product can be carried city centre to outside of the city by sky train, it will also help for space logistics infrastructure.

Slow Logistics: Special service for customers who care environment and there is not any time limit in carriage.

Supply Chain Management: Management of procuring, producing, and delivering products and services to customers.

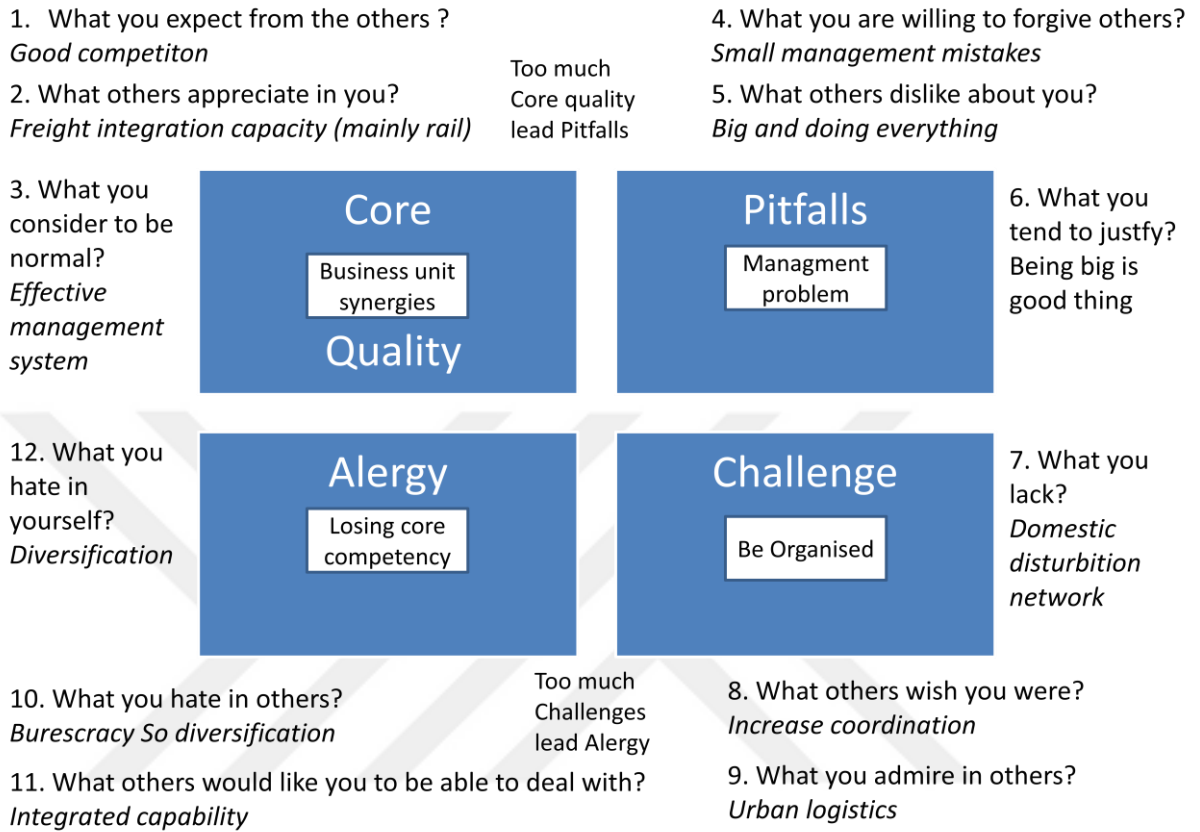
Underground Logistics: Which is canal, train or road system in underground to distribute inter city without causing any traffic congestion.

Urban Mining: The process of findings parts from products, buildings and waste.



Appendices

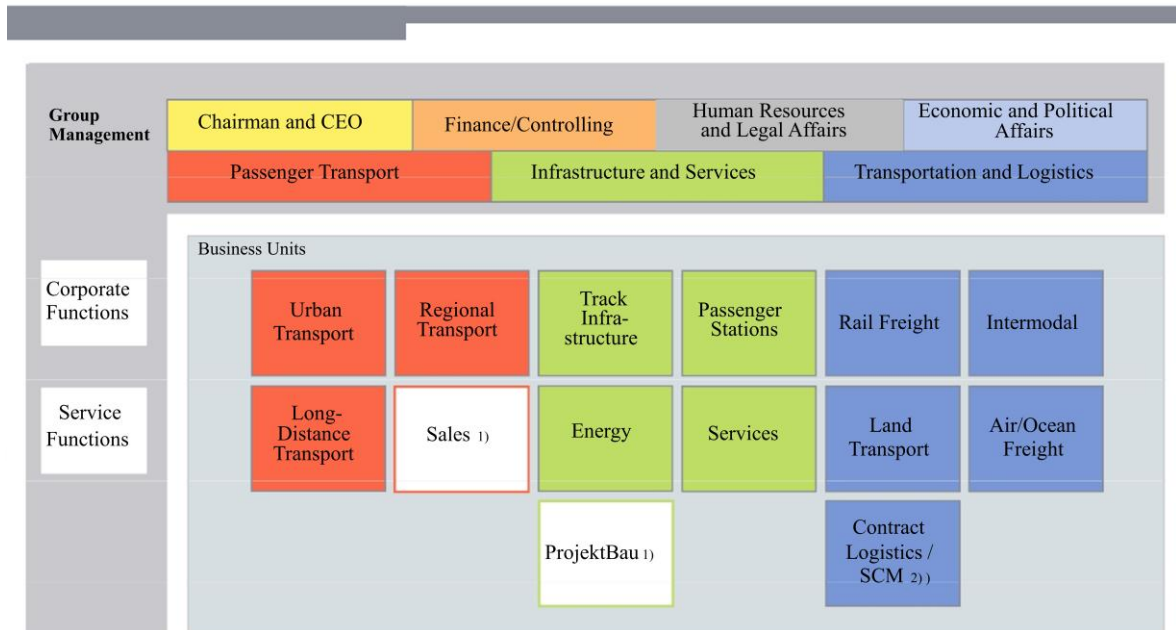
Appendix 1 Core Quadrants Model For DB Schenker AG



Core quadrants model (Ofman, 2001; DB Schenker AG, 2008; DB Schenker, 2011)

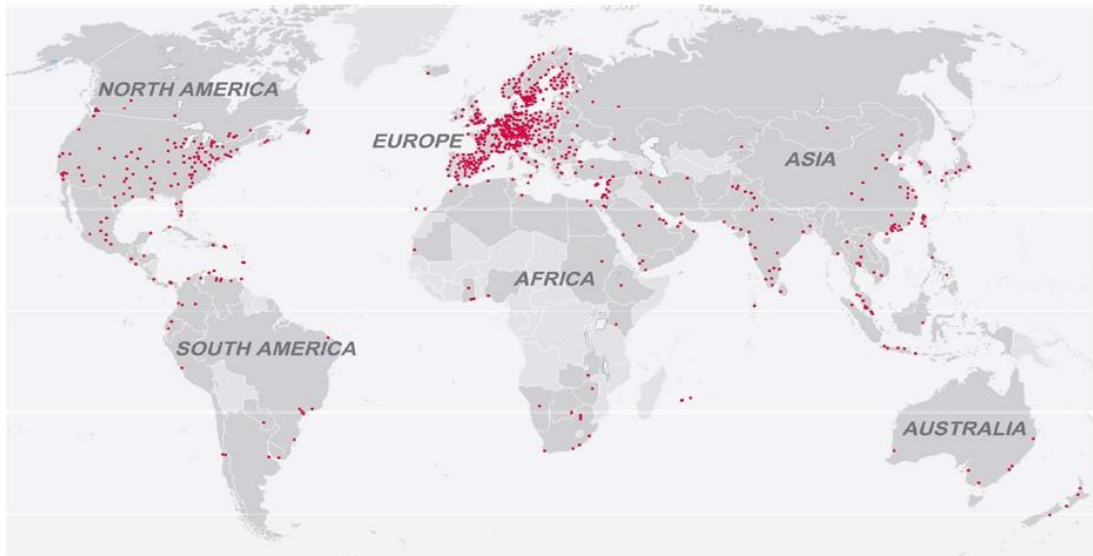
This model answers 12 main questions about company and rivals. According to analysis, main core quality of company “synergies” which arises from networking, rail freight leadership and integrate capability. Main pitfall of Schenker is management problems. This problem arises from being big and complicated. Main challenges organization capacity the main allergy of schenker is losing core competencies.

Appendix 2 DB Group Structure



DB Group structure (DB Schenker AG, (2008))

Appendix 3 DB Schenker AG Offices



DB Schenker AG Offices (DB Schenker AG, (2008)