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MASTER THESIS

**Mobile Virtual Network Operators in Europe.
Strategic and Legal Analysis**

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Abstract

Title: Mobile Virtual Network Operators in Europe.
Strategic and Legal Analysis

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Purpose: To assess the growth options and business potential of MVNO models in Europe.

Summary:

Nowadays more and more mobile virtual network operators (MVNOs) are entering European market and they are considered to be mostly a European phenomenon. This is the best opportunity for telecommunication companies to expand without investments in network constructing and buying expensive licenses and also an opportunity for brand non-telco companies to enter telecommunication market. This thesis examines the influence of external environment on mobile telecommunications industry and provides the analysis of the key factors within the industry and their impact on MVNO business model. External analysis helps to assess the attractiveness of mobile telecom industry and advantages which potential entrants can obtain as MVNO. Generic strategies analysis provides the examples of the most successful competitive strategies employed by existing MVNOs (Virgin mobile and Tele2) and examines the advantages of those strategies.

In order to understand the environment MVNOs are acting in, it is essential to analyse the legal framework of the mobile telecommunication market. The provision of access to mobile MVNOs remains one of the most controversial issues within the European Union. It is not mandated by the current regulatory framework, but new Telecommunications Package provides specific actions for mobile operators obliging existing mobile operators to unblock the access to the existing networks to MVNOs. Apart from the specific-industry regulations the role of general competition law remains fundamental. *Essential facilities* doctrine is applied to analyze the basic rights potential MVNOs may rely on within the European Union.

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1. Introduction

1.1. Background

The mobile telecommunications industry is evolving rapidly as the extensive liberalisation of telecommunications abolishes former barriers protecting national communications markets¹. That creates more business opportunities both for existing mobile network operators (MNOs)² and new market actors. Mobile Virtual Network Operator (MVNO) is fairly new player in the mobile telecommunications industry; it offers mobile subscription in its own brand name and doesn't need a frequency license in the market.

During the last 5 years lots of market actors both from telecom and non-telecom industries are changing their attitudes to the new business opportunities provided by MVNO business model. In the end of 1990s, most of the mobile operators and national regulatory authorities were quite sceptical, claiming that the benefits of MVNOs are unproven, and that there was inadequate evidence that market failure might occur. But the success of the biggest MVNOs such as Virgin Mobile (launched in 1999 in the UK) and Tele 2 Denmark (launched in 2000) and further successful MVNO models show that they have great potential in the telecom market.

The MVNO concept has taken Europe by storm and is considered to be mostly European phenomenon. The main reasons for it is the fact that the wireless industry there has reached 80% penetration level, and because European incumbent mobile operators have embraced MVNOs as a means of deriving revenue to offset the enormous cost of building 3G networks³.

1.2. Problem discussion

The MVNO concept is quite innovative and there is still the absence of MVNO's common definition on the European level which increases confusion both for market players and national regulatory authorities. Some MNOs still have negative approach towards this kind of new players and see more disadvantages than advantages in cooperating with MVNOs. The behaviour of incumbent mobile operators is crucial for the companies which are willing to enter into MVNO commercial agreement and have no other opportunities for entering mobile telecom market.

National regulatory authorities have had no power to influence incumbent operators for a long time. But new EU telecommunications framework, which came into force in July 2003, enables national regulatory authorities to monitor if incumbent operators "negotiate in good faith with undertakings requesting access"⁴.

¹ Watson, C., Wheadon, T & Temple Lang, J (1999) "Telecommunications. The EU law", pg. viii

² For the purpose of this thesis mobile network operators (MNO) will be also named traditional operators, incumbent mobile operators and licensed operators.

³ Luna, Lynnette (2002) "Carriers look beyond brand", Telephony, vol. 242, iss. 7, pp. 35-38

⁴ Directive 2002/19/EC on access and interconnection, Art. 12(1). OJ L 108, 24.4.2002, p. 7

The access issue is not the only one problem faced by the MVNOs. There are various external and internal factors which influence the positioning and performance of MVNO. Some MVNOs are successful and others are not. There is no common formula for success and different analysts and companies offer different solutions.

The problem area of this thesis may be divided into three main parts:

- incumbent mobile operators' approach (evaluating advantages and disadvantages of entering into MVNO commercial agreement);
- the EU and national regulatory authorities approach (discussing their role and regulatory framework);
- MVNO approach (assessing attractiveness of the telecom industry and competitive strategies of the most successful MVNO business models)

The research questions are:

- "Why mobile telecommunication industry is attractive for MVNO?"
- "How MVNO can succeed in the mobile telecommunications industry?"
- "What are the main opportunities and risks for potential and existing MVNOs?"

1.3.Objectives

The aim of this thesis is to assess the potential and growth options of MVNO business models. The analysis of benefits and risks bearing by incumbent operators gives a rational explanation of their market behaviour, stressing the new business opportunities provided by MVNOs.

Analysis of external environment shows the attractiveness of the mobile telecom industry and advantages which potential entrants can obtain as MVNO.

Finally, analysis of the most successful MVNOs' generic strategies is important for understanding possible ways to succeed for market players from telecom and non-telecom industries.

1.4.Target group

The target group of this thesis are academics and students who are interested in telecommunications. This study might be also thought-provoking for non-telecom companies which are looking for the new ways of expanding their core-business.

1.5 Delimitations

The research concentrates on the main opportunities and obstacles which potential and existing MVNOs can face within the EU mobile telecom market, and doesn't focus on internal analysis or financial viability of the particular MVNO. The legal and external environment analysis covers the whole European market, with an impact on Danish and UK mobile telecom sectors. Tele2 Denmark and Virgin Mobile UK have been chosen in

order to illustrate the most successful generic competitive strategies employed by existing MVNOs. However, it shouldn't be perceived as a perfect strategy for any type of MVNO in Denmark, the UK or the EU.

The main part of business analysis is based on Porter's framework which allows examining attractiveness of the mobile telecom industry and the main generic strategies of MVNOs. The thesis doesn't focus on the overview of existing critics of Porter's framework, since selected models correspond to the main goals of the study.

1.6. Structure of the thesis

Chapter 1 introduces the research topic and formulates the problem and objectives

Chapter 2 describes the methodology used throughout the research

Chapter 3 presents a theoretical framework: Porter's Five Forces, PEST framework and Generic Strategies

Chapter 4 describes mobile telecommunication industry in Europe

Chapter 5 introduces MVNO concept

Chapter 6 analyses the regulatory environment

Chapter 7 analyses based on the theories described in *Chapter 3*

Chapter 8 presents conclusions and suggestions for future research

2. Methodology

2.1. Research strategy

Main research strategies can be divided into the following main groups: survey, experiment, history analysis of archival records and case study⁵. Each strategy differs in a way of collecting and analyzing empirical evidence and has positive and negative aspects. The most appropriate strategy for this thesis is the case study, which is both descriptive and explanatory. It helps to answer “how” and “why” questions when the researcher has little control over events and when the focus is on a current phenomenon in a real-life context. It also benefits from the prior development of theoretical propositions to guide data collection and analysis⁶. This study has mostly qualitative character, based both on qualitative and quantitative primary and secondary data.

2.2. Case-study design and selection

A main distinction in designing case studies is between single- and multiple-case designs, which can be either holistic (single unit of analysis) or embedded (multiple units of analysis). Single case is chosen when the case represents a critical case in testing a well-formulated theory. Another rationale for a single case is when the case represents an extreme or unique case. The third motivation is the revelatory case, when a researcher has an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation. A multiple-case design has the advantage of generating more compelling evidence making the overall study more robust⁷.

A multiple-case study has been chosen since it will allow answering research questions from the different perspectives. Tele 2 Denmark and Virgin Mobile UK are the examples of the most successful MVNOs in Europe. However, they have completely different strategies and tools for remaining the winners. Virgin Group had no experience in mobile telecommunications industry and relies mostly on its strong brand and reputation, while Tele 2 AB operates in Sweden as a licensee and prefers to expand geographically as an MVNO.

The analysis of the external environment is based on PEST framework and the theoretical framework provided by Michael E Porter⁸. Porter’s five forces analysis allows understanding the main reasons of the mobile telecommunication industry attractiveness, while PEST analysis provides environmental scanning, which helps to examine the main threats and opportunities for MVNO. Further comparison of the MVNOs and MNOs market position explains the reasons why new market players prefer to enter telecom

⁵ Robert K. Yin (1994) Case study research : design and methods, 2nd edition, Sage Publications

⁶ Ibid

⁷ Ibid

⁸ Porter M. E. (1980), Competitive strategy. Techniques for Analyzing Industries and Competitors, the Free Press

industry as MVNOs. Generic strategies analysis explains and analyses the possible successful competitive strategies for MVNOs.

2.3. Legal approach

Regulatory framework analysis is essential for understanding the legal environment MVNOs are acting at. Since “*refusal to deal / denial of access*” is one of the main problems for the market entry by MVNOs it is crucial to interpret the relevant EU law and analyse the recent changes in the EC telecommunications law. Apart from the specific-industry regulations the role of general competition law remains fundamental. *Essential facilities* doctrine is applied to analyze the basic rights potential MVNOs may rely on within the European Union.

2.4. Data Collection

There are six different sources for case study evidence, namely documentation, archival records, interviews, direct observation, researcher’s observation and physical artefacts. The different categories are complementary and no single source has complete advantages over the other⁹. For this research documentation, archival records, interviews and researcher’s observation have been used. The most important source for the study is documentation.

Data collection can be also divided into two main categories, primary and secondary data. The primary data refers to data that is collected by the researcher, while secondary data refers to data that has already been collected and is available in periodicals, academic literature, journals, etc.

The preliminary research included the review of telecommunications magazines, academic articles, current EC telecommunications law and recent cases. After the problem formulation, the theoretical framework for the business analysis has been chosen and legal approach has been formulated. Simultaneously with secondary data collection, the contact list of potential interviewees has been created. The questionnaires have been sent in the middle of research process, when the required knowledge for questions formulation has been acquired. The overall data collection process estimates 6 months and includes persistent overview of the legal and economic changes within the mobile telecommunications industry.

It is notable, that there is a distinction between data sources for business and legal parts of the research. The case-law and regulations are considered to be secondary data for business study, while it is primary for legal analysis. In order to make it clear for the reader, the legal sources are discussed in a special subchapter.

2.4.1. Primary data

The collection of primary data was conducted by interviews and personal observations. All the interviewees received the questionnaires, which include a few questions and

⁹ Robert K. Yin (1994) Case study research : design and methods, 2nd edition, Sage Publications

allowed interviewees to choose the way of expressing their opinion. The amount of questions allowed to increase the possibility of feedback (in terms of time requirements which interviewees are able to spend on answering the questions).

The interviewees can be divided into several categories:

1. *National Regulatory Authorities*. Danish (NITA) and UK (OFCOM) regulatory authorities have been contacted, in order to clarify their position on existing and potential MVNOs, and the influence of new regulatory framework on national mobile telecom market.
2. *European Commission*. *DG Information Society* provided the information on possible changes of MVNOs status in the 3G environment, and together with *DG Competition Directorate C* (Information, communication and multimedia) explained the impact of new regulatory framework on NRAs, the role of Commission in regulating MVNOs' issues and the role of EC competition law in telecom sector.
3. *MVNOs*. Virgin Mobile UK and Tele 2 has been contacted in order to explain the main vision and mission of existing MVNOs and their attitude towards new potential competitors.
4. *Experts and telecom journalists*. Some authors of the articles about MVNOs from telecom magazines and analysts from Forrester research, Ovum, Spinbox and Pyramida Research has been contacted. The questionnaire was indented to get their opinions on the development of MVNO business model in Europe and the main factors of its success.

However, MVNO concept remains fairly new and sensitive issue; that partly explains the lack of feedback from primary sources. The questionnaire and information about interviewees is listed in Appendix VI.

2.4.2. Secondary data

Secondary data was collected from the specialized sources: telecom magazines, Internet sources, surveys conducted by consulting agencies for the European Commission and International Telecommunications Union (ITU), administrative documents (annual reports, proposals and other internal documents), books, and industry papers. The access to telecom articles was mainly acquired with help of ELIN database¹⁰, and included different academic articles from telecom and management magazines like *Telecommunications International*, *Telephony*, *Wireless Review*, *InfoWorld*, *European Business Review*, *European Transactions in Telecommunications*, *Marketing Week* and *Management Today*. The articles from *Financial Times*, *International Herald Tribune* and *the Guardian* have been used as well. Analysts' surveys include the *UMTS Forum*, *Telos Technology* and *Deutsche Bank White Papers* on mobile evolution, *Arthur D Little* research for EURESCOM Summit, *Andersen* final report on 3G Technologies for the European Commission, *Pyramida Research*, *Analysis Research* and *Ovum* studies, ITU surveys and working papers on MVNO and National Regulatory Authorities (OFCOM) reports. The main Internet sources embrace web sites of the following organisations: ITU, GSM Group, UMTS Forum, OFCOM, NITA, Virgin Mobile and Tele2. Sources of

¹⁰ <http://elin.lub.lu.se/elin/loadf?f=infopage>

applied theories include textbooks on strategic analysis, written by Michael E. Porter, Robert M. Grant, Johnson and Scholes, and Thompson and Strickland.

2.4.3 Sources for the legal analysis

Primary sources for the legal analysis consist of EU regulation and case-law. New telecom regulatory framework includes seven directives, one regulation, guidelines and notices. The main cases cover the time period from the mid 1970s to 2004 and include the latest ECJ decision made on the 29th of April 2004. Sector specific regulations and all the relevant cases are available on the European Commissions' official web site. Secondary sources embrace the European Commission reports and Communications Reviews, National Regulatory Authorities reports, ITU workshops and academic articles and reviews from the *Kluwer Law International* data base (magazines: *Business Law Review*, *Common Market Law Review*, *Journal of Network Industries*, *European Foreign Affairs Review*). Apart from the specialised reviews, the information on applied theory (essential facilities doctrine) was obtained from the EC competition law textbooks (Larouche, Jones and Sufrin, Bellamy and Child, Whish, Korah, and Goyder).

2.4.4. Critique of the Sources

The rapid changes within the telecom industry require persistent overview of the most up-to-date information, which becomes outdated fairly quickly. New MVNOs are entering the market and more and more traditional operators are launching 3G networks. However, the data have been updated during the whole research period and results of the previous analysis have been confirmed with new data.

Another aspect concerns the objectivity of the sources. Most of the sources are independent from each other and represent opinions of a great variety of analysts and experts. However, the European Commission reviews and reports, as well as interviews, has been one of the main sources of information for the legal analysis. But nevertheless, it can be justified by the fact, that the Commission plays the key role in regulating mobile telecom issues within the EU at present.

3. Theory

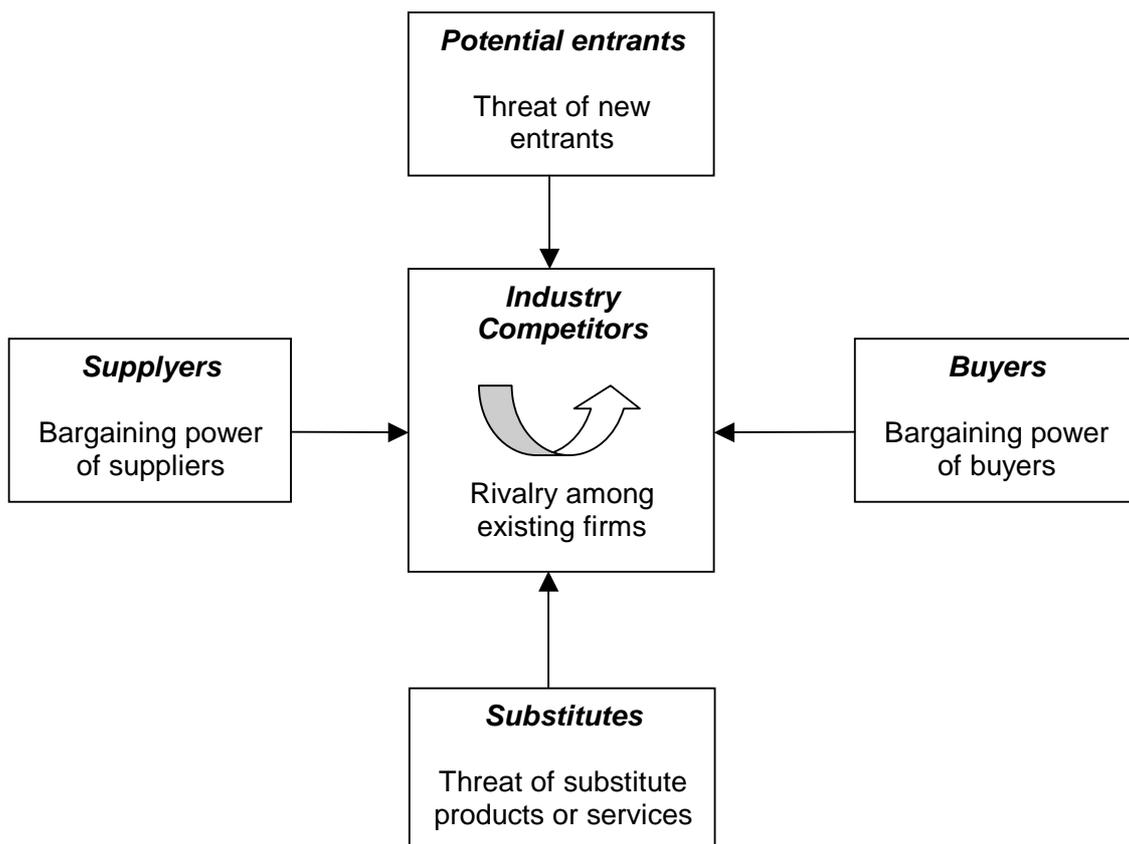
3.1. Porter's five forces

Porter's five forces framework has been chosen for conducting the analysis, because it provides a structured approach for examining a particular sector.

One of the mostly well-known methods of external analysis is **Porter's Five Forces**, a model developed by Professor Michael Porter of the Harvard Business School¹¹. Porter identified and demonstrated that the state of competition for company is a compound of five competing forces:

1. The potential entry of new competitors
2. The market attempts of organizations in other areas to win your end users over to their own substitute products and services
3. And the bargaining power and leverage by the end users or buyers of the product and service.
4. The bargaining power and leverage of suppliers of the organization
5. The rivalry of competing organizations

Figure 3.1 Porter's five forces



Source: Porter (1980), p. 4

¹¹ Porter, M. E. (1980) "Competitive Strategy. Techniques for Analyzing Industries and Competitors", The Free Press

Porter's Five Forces attempts to assess potential levels of profitability, opportunity and risk based on five key forces within an industry. The collective power of these forces determines the profit potential in the industry. The lower the power of competitive forces is – the higher is the profitability of the industry; so the main goal of competitive strategy for a company is to find a position where it is able to defend itself against these forces or to influence them in its favour.

Threat of New Entrants

The easier it is for new companies to enter the industry, the more aggressive competition there will be, hence the industry less profitable. Factors that can limit the threat of new entrants are known as barriers to entry. The main factors contain Capital requirements, Economies of Scale, Cost Disadvantages, and Governmental and Legal Barriers.

The capital requirements can be very high, when the entrant has to invest large financial resources in order to compete. It might create considerable barrier to entry and discourage potential market players.

Economies of Scale refer to declines in unit cost of a product as the absolute volume per period decreases. New entrants face the problem of either entering on a small scale and accepting high unit costs or entering on a large scale and running the risk of drastic underutilization of capacity while they build up sales volume¹².

Cost disadvantages are not dependent of scale only. Access to raw materials, favourable location, government subsidies and proprietary product technologies are the most common absolute advantages which established companies obtains just because they entered the market earlier and also have more experience. Experience can law costs in marketing, distribution and other areas; also employees improve their methods and become more efficient with time.

Governmental and Legal Barriers are crucial and the strongest for potential entrants. Government is able to limit or foreclose entry into industries by licensing requirements or limits on access to raw materials

Availability of Substitutes

Porter's Five Forces model refers to “substitute products” as those products that are available in other industries that meet an identical or similar need for the end user. As more substitutes become available and affordable, the demand becomes more elastic since customers have more alternatives. Substitute products may limit the ability of firms within an industry to raise prices and improve margins. If the cost of switching is low, then this poses to be a serious threat. The main factors that can affect the threat of substitutes are the similarity of substitutes. If substitutes are similar, then it can be viewed in the same light as a new entrant. Hence, if the is high pressure from substitute products, then the profit potential is low.

¹² Robert M. Grant “*Contemporary strategy analysis—concepts, techniques, applications*” 4th edition, 2002 p.75

Power of Buyers

The power of buyers describes the impact customers have on an industry. When buyer power is strong, the relationship to the producing industry becomes closer to what economists term a **monopsony**. A Monopsony is a market where there are many suppliers and one buyer. Under these market conditions, the buyer has the most influence in determining the price. Few pure monopsonies actually exist, but there is often a connection between an industry and buyers that determines where power lies. High bargaining power of buyers increase competition and makes the industry less profitable. The main reasons why the bargaining power of buyers may increase include the following factors: Concentration and size of buyers, Product differentiation, Buyers' switching costs, Buyers' information, Buyers' ability to backward integration

The fact that buyers are *concentrated* or purchases *large volumes* relative to seller sales, raises their importance for the supplier and therefore increases the bargaining power of buyers.

The less *differentiated* the products of the supplying industry, the more likely the buyer is to switch suppliers on the basis of price.

Switching costs may block the buyer to particular sellers. Hence, low switching costs increase the ability of buyers to change their suppliers and amplify the power of buyers.

The better *informed* buyers are about demand, actual market prices and supplier costs, the better they are able to bargain. If the buyer has full information about the industry, it gets the greater position to insure that it receives the high quality products for the most favourable price.

Buyers may possess credible *backward integration* ability, which can threaten to buy producing company or rival. Buyers' power can be partially neutralized when companies in the industry offer a threat of forward integration into the buyers' industry.

Power of Suppliers

An industry that produces goods requires raw materials. This leads to buyer-supplier relationships between the industry and the firms that provide the raw materials. Depending on where the power lies, suppliers may be able to exert an influence on the producing industry. They may be able to dictate price and influence availability.

Several factors influence the power of suppliers relative to that of buyers:

Size and concentration of suppliers relative to buyers is an important factor, as suppliers which sell to more fragmented buyers are usually able to exert substantial influence in prices, quality, and terms.

If the *buyers' industry is an important customer for the suppliers*, suppliers' revenues are closely related to the industry and they are likely to protect it through reasonable pricing.

Importance of the suppliers' product for the buyers' business raises the supplier power. This is particularly true where the input is not storable, thus enabling the buyer to build up stocks of inventory.

High *suppliers' switching costs and product differentiation* facing the buyers cut off their options to change suppliers. If the suppliers face switching costs the effect is the reverse.

Competitive Rivalry

Firms strive to secure a competitive advantage over their rivals. Rivalry occurs because one or more competitors either feel the pressure or sees the opportunity to improve position. In some industries, firms compete aggressively by pushing prices below the level of costs which leave the entire industry worse off from the standpoint of profitability. In others, price competition is muted and rivalry focuses on advertising, innovation and other nonprice dimensions.

The intensity of rivalry is influenced by the following industry characteristics:

Concentration of Competitors refers to the number and size distribution of companies competing within an industry. When firms are numerous, there is a greater possibility of mavericks. If the firms are equally balanced in terms of size and resources, it still creates instability because they may be prone to fight each other and have the resources for sustained and vigorous retaliation. When the industry is dominated by a few firms, there is little mistaking relative strength and the leaders can play a coordinative role in the industry through price leadership.

Competitors may *diverse* in strategies, visions, goals, terms of origin, etc. That gives them an opportunity to avoid price competition using their own market tools which can differ from the main competitors. *Strategic Stakes* refers to the company's interest in achieving success in the particular industry.

High *fixed costs* create strong pressure for all companies to fill *excess capacity* which often lead to price cutting when over-capacity is present.

If the *industry growth* is rapid, firms can improve their results and gain revenues simply by keeping up with the industry. All their financial and managerial resources may be consumed by expanding with the industry.

Exit barriers limit the ability of a firm to leave the market. This may cause the resort to extreme tactics which can lead to the low profitability of the whole industry as a result.

3.2. PEST Framework

In addition to market forces within the industry, it is essential to monitor external forces that may impact the industry itself. The PEST analysis examines the broad external environment in which the company is operating. The acronym stands for the Political/legal, Economic, Social and Technological factors that could affect an industry, and hence, organization's existence and performance as well. While Porter's 5 forces analyse current influence of external forces, PEST is used to look at the future impact of environmental factors, which may be different from their past impact¹³ and helps to define opportunities and threats for the market player.

The table below lists some possible factors that could indicate important environmental influences for a business under the PEST headings:

¹³ Johnson, G. and Scholes, K. (2002) "Exploring Corporate Strategy", (6th Ed) Harlow : Financial Times Prentice Hall, 2002

Figure 3.2. Macro-environmental influences – The PEST framework

Political / Legal	Economic	Social	Technological
- Government stability	- Economic growth (overall; by industry sector)	- Income distribution (change in distribution of disposable income;	- Government spending on research
- Product safety	- Monetary policy (interest rates)	- Population demographics	- Government and industry focus on technological effort
- International trade regulation	- Government spending	- Labour / social mobility	- New discoveries and development
- Health and safety	- Economic "mood" - consumer confidence	- Lifestyle changes	- Speed of technology transfer
- Monopolies legislation	- Taxation	- Attitudes to work and leisure	- Rates of technological obsolescence
- Government organisation / attitude	- Exchange rates	- Levels of education	- Impact of changes in Information technology
- Competition regulation	- Inflation (effect on costs and selling prices)	- Fashions and fads	- Internet
	- Stage of the business cycle (effect on short-term business performance)		

Modified from Johnson and Scholes 2002, p.102

The number of macro-environmental factors is unlimited; therefore it is important to prioritize and monitor factors which have the highest impact on a certain industry (in this case mobile telecommunications industry).

Political/Legal

Political and legal issues have a great impact on businesses and industries. EU law is changing and Member States have to implement more and more directives and regulations which may influence both industries and organizations. Multinational companies are the most sensitive to changes and differences in national laws. They should continually monitor the stability of governments, understand differences in governmental practices, know the rules in terms of importing and exporting goods, and be knowledgeable about the laws that impact the industry and the business in each country. These factors can impact the structure and profitability of the business and industry in each country.

Economic

The economy can have a great impact on profitability within an industry and organization. Exchange rates, inflation, economic growth, monetary policies are factors

that impact the strength of the economy and consumers' behaviour. These factors provide indicators to potential concerns on recession and inflation. The economy may lead to reduced spending by consumers that have a rebound effect throughout companies and industries. Monitoring these factors assist in forecasting sales and profits appropriately and devise appropriate strategies to ride out an unfavourable economic environment. Sometimes companies can take advantage of an economic downturn to gain share and customers from competitors.

Social

Social trends are changing fairly fast. Examples in the past decade include the health and fitness obsession, the growth in discretionary spending by young people; desire to be up-to-date using modern technologies. These trends can have a serious impact on entire industries, as well as individual companies. Understanding of social trends is essential in order to make sure that the product continues to meet the needs of the consumers it serves. New attributes may emerge and the importance of existing attributes may change as a result of changes in society. Cross-cultural differences are also critical for the new market entrants, as expectations may be very different based on the social structure and societal expectations of the specific culture.

Technology

Information and communication technologies play an essential role in determining competitiveness, employment and economic growth. They create new opportunities that at the same time affect existing production, communication and distribution processes. In doing so, they hold the potential to change the spatial division of labour and production within, and across, countries, sectors, and enterprises. By increasing rapid access to both information and people, mobile technology in particular helps markets work more efficiently, by allowing consumers to seek the lowest price, and enabling firms to get quotes from more suppliers.

3.3 Generic competitive strategies

Based on the five forces analysis, Porter suggests three generic strategies that organisations could implement in order to establish a competitive advantage: overall cost leadership, differentiation and focus¹⁴. A low-cost provider strategy appeals to a wide spectrum of customers based on being the overall low-cost provider of a product or service. A company employing Porter's strategy of differentiation would offer a product that is unique in regard to rivals' products or services. A focused (or market niche) strategy concentrates on a narrow buyer segment and serving niche members at a lower cost than competitors or offer them customized attributes that meet their tastes and requirements better than competitors' products or services.

¹⁴ Porter, M. E. (1980) "Competitive Strategy. Techniques for Analyzing Industries and Competitors", The Free Press

Figure 2.3 Three Generic Strategies

		STRATEGIC ADVANTAGE	
		Uniqueness Perceived by the Customer	Low Cost Position
STRATEGIC TARGET	Industrywide	DIFFERENTIATION	OVERALL COST LEADERSHIP
	Particular Segment only	FOCUS	

Source: Porter (1980), p. 39

Low-cost provider strategy

The advantage of successfully employing this strategy is that a company can achieve profit at a selling price below its' competitors breakeven point. Cost leadership requires:

- Sustained capital investment and access to capital;
- Process engineering skills;
- Intense supervision of labour;
- Low-cost distribution system;
- Tight cost control;
- Incentives based on meeting strict quantitative targets.

There two main ways to achieve superior profit performance. The first option is to use the lower-cost edge to underprice competitors and attract price-sensitive buyers in great enough numbers to increase total profits. The second option is to refrain from price cutting altogether, be content with the present market share, and use the lower-cost edge to earn a higher profit margin on each unit sold, hence raising the company's total profits and overall return on investment¹⁵. A low-cost position defends the firm against powerful buyers, as buyers can exert power only to reduce prices to the level of the next most efficient competitor. Defence against powerful suppliers expresses in providing of more flexibility to cope with input cost increases.

Low-cost competitive strategy is particularly powerful in the following cases:

- Price competition among rival sellers is very dynamic (low-cost providers are in the best position to compete offensively on the basis of price);
- The industry's product is essentially standardized or a commodity readily available from a host of sellers (under these conditions higher-cost rivals' profits get squeezed the most);

¹⁵ Thompson A.A., Jr., Strickland A.J. (2001) "Crafting and Executing Strategy", Twelfth Edition, McGraw-Hill Irwin

- There are few ways to achieve product differentiation that have value to buyers (when the differences between brands don't matter much to buyers, they are looking for the best price);
- Most buyers use the product in the same way (with common user requirements, a standardized product can satisfy the needs of buyers, in which case low selling price becomes the dominant factor in their choice);
- Buyers incur low switching costs in changing sellers (flexibility to shift purchases to lower-priced seller);
- Industry newcomers use introductory low prices to attract buyers and build a customer base (the low-cost provider acts as a barrier for new entrants)¹⁶.

Each generic strategy carries risks, including low-cost competitive approach. These include inability to see required product or marketing change because of the attention placed on costs; technological change that nullifies past investments or learning; low-cost learning by industry newcomers or followers and inflation in costs that narrow the firm's ability to maintain enough of a price differential to offset competitors' brand images or other approaches to differentiation.

Differentiation

Differentiation is an attractive competitive approach whenever buyers' needs and preferences are too diverse to be fully satisfied by a standardized product or by sellers with equal capabilities. Common requirements include:

- Strong marketing abilities;
- Product engineering;
- Creative flair;
- Strong capability in basic research;
- Strong cooperation from channels;
- Strong coordination among functions in R&D, product development, and marketing.

There are four basic approaches for achieving a differentiation-based competitive advantage. First is to integrate product attributes and user features that lower the buyer's overall costs of using the company's product. The second approach is to incorporate features that raise the performance a buyer gets out of the product. A third approach refers to incorporating features that enhance buyer satisfaction in noneconomic or intangible ways. The fourth one is to compete on the basis of capabilities; to deliver value to customers via competitive capabilities that rivals don't have or can't afford to match¹⁷. Differentiation is a viable strategy for getting profit in an industry because it creates a defensible position for coping with the five competitive forces, although in different way than cost leadership. Differentiation provides insulation against competitors because of brand loyalty by customers and resulting lower sensitivity to price. It also increases margins, which in turn, avoid the need for a low-cost position.

¹⁶ Ibid

¹⁷ Thompson A.A., Jr., Strickland A.J. (2001) "Crafting and Executing Strategy", Twelfth Edition, McGraw-Hill Irwin

Differentiation strategy is the best choice for the company in the following market conditions:

- There are many different opportunities to differentiate the product and buyers perceive these differences as having value;
- Buyers needs are diverse;
- Few rivals are following a similar differentiation approach (competitors use different ways in pursuing uniqueness and try to appeal to buyers on different combinations of attributes);
- Technological change and product innovation are fast-paced and competition revolves around rapidly evolving product features¹⁸.

The most important risk of differentiation strategy involves the circumstances when the cost differential between low-cost competitors and the differentiated company becomes too great for differentiation to hold brand loyalty. In this case buyers may sacrifice some of the features in order to get the better price. Other risks include the imitation, which can narrow perceived differentiation and the fall of buyers' need for the differentiation.

Focus

The main goal of a focused strategy is to do better job of serving buyers in the target market niche than rival competitors. As a result, the company achieves either differentiation from better meeting the needs of the particular market segment, or lower costs in serving this segment, or both. The main requirements for the focused strategy combine overall cost leadership and differentiation policies directed at the particular strategic target.

This approach becomes increasingly attractive under the following conditions:

- The target market niche is big enough to be profitable and offers good growth potential;
- Industry leaders are not interested in that particular market segment;
- It is costly or difficult for competitors to meet specialized needs of the targeted market, and at the same time satisfy their mainstream customers;
- The industry has many different niches and segments, which allow to pick a competitively attractive niche suited to the company's resource strengths and capabilities;
- Few, if any, other rivals are trying to target the same market segment (reduces the risk of segment overcrowding);
- The focuser is able to compete against challenges based on the capabilities and resources it has to serve the targeted niche.

Focused strategy carries several risks. One is the possibility that competitors can find submarkets within the strategic target and outfocus the focuser. A second is the potential for the preferences of niche members to shift toward the product attributes desired by the majority of buyers. The third risk is that the segment becomes very attractive for the competitors, which in turn may intensify rivalry and splinter segment profit.

¹⁸ Ibid

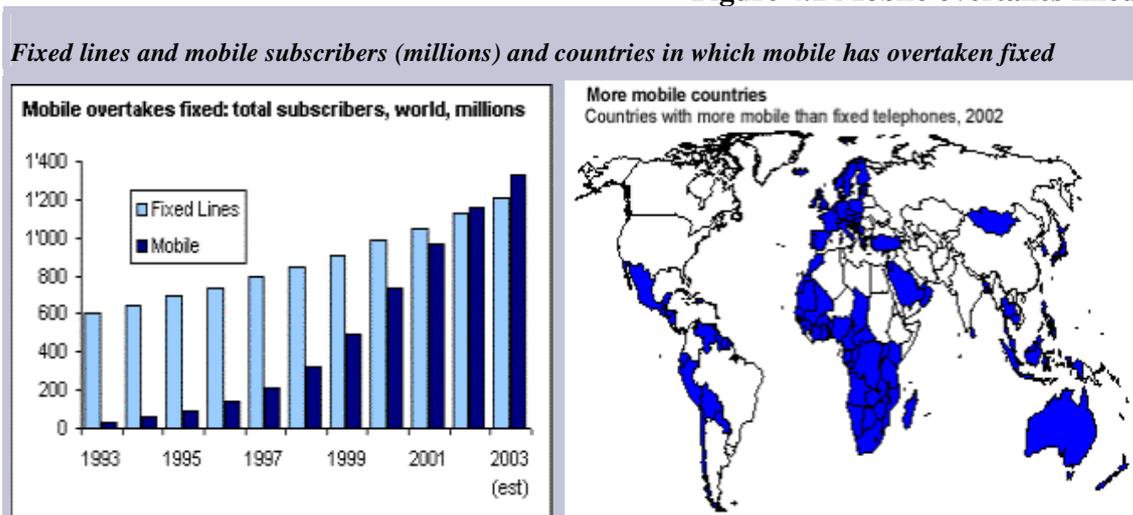
4. Mobile telecommunication industry in Europe

4.1. Mobile overtakes fixed

Recently, the world markets have seen an explosion in the growth of information and communication technologies, and particularly mobile communications. The year 2002 marked a turning point in the history of telecommunications in that the number of mobile subscribers overtook the number of fixed-line subscribers on a global scale, and the number of subscribers continues to grow, although more slowly now that many economies are approaching universal coverage. At the end of 2003, there were over 1.35 billion mobile subscribers worldwide, compared with only 1.2 billion fixed-line users (see Figure 4.1). The rise of mobile telephony to overtake fixed has different implications, but perhaps the most significant relates to access to basic telecommunication services and information and communication technologies (ICT). It is remarkable that this explosion in the use of mobile telephony has occurred largely irrespective of geographic, socio-demographic or economic criteria¹⁹.

According to data from the International Telecommunication Union (ITU), Western Europe has the highest mobile penetration: averaged 80% at the end of 2002, and ranged from highs of more than 90% in Italy and Portugal to a low of approximately 65% in France.

Figure 4.1 Mobile overtakes fixed



Source: International Telecommunication Union (ITU)

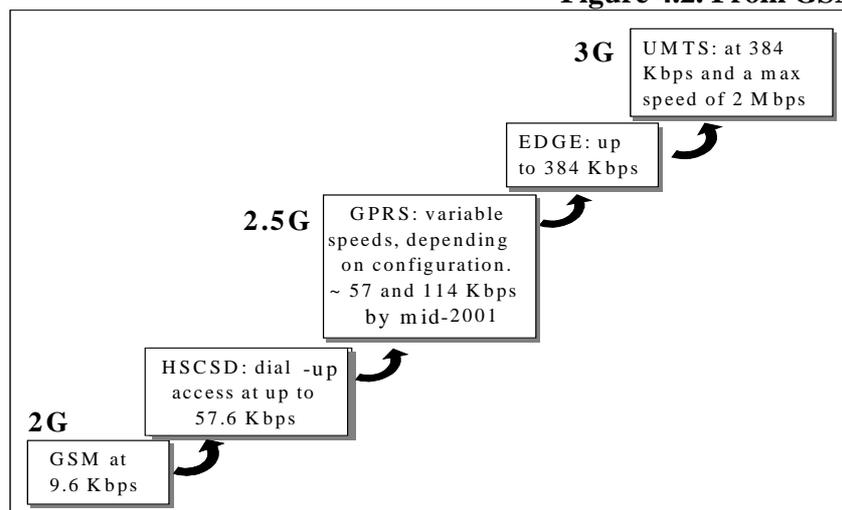
4.2. GSM - The Wireless Evolution

The GSM story began in the early 1980's, when European countries struggled with no fewer than nine competing analogue standards, including Nordic Mobile Telephony

¹⁹ International Telecommunication Union (2003) "Mobile overtake fixed. Implications for police and regulation" http://www.itu.int/osg/spu/ni/mobileovertakes/Resources/Mobileovertakes_Paper.pdf (27.04.04)

(NMT), Total Access Communications Systems (TACS), etc. Europeans recognized the need for a completely new system – a system that could accommodate an ever-increasing subscriber base, advanced features and standardized solutions across the continent²⁰. Because of the shortcomings and incompatibility issues associated with analogue systems, a completely new digital solution was instituted. The new standard, Groupe Spéciale Mobile (GSM), was built as a wireless counterpart of the land-line Integrated Services Digital Network (ISDN) system. Although GSM initially stood for ‘Groupe Spéciale Mobile’, named after the study group that created it, the acronym was later changed to refer to ‘Global System for Mobile communications’. Since 1992, it has been adopted by nations around the globe and now incorporates over 616 operators and 200 countries worldwide. In Europe, by 1997, one new customer was signing up to GSM networks every second, according to estimates from the GSM MoU Association²¹. Enhancements upon 2nd generation GSM systems include HSCSD (High Speed Circuit Switched Data), GPRS (General Pack Radio Service), and EDGE (Enhanced Data Rate for GSM evolution) – all of which allow for higher data transmission rates. The main goal of GSM migration is to reach UMTS (3G) and the following figure illustrates the major steps from GSM to UMTS.

Figure 4.2. From GSM to UMTS



Source: International Telecommunication Union (ITU)

HSCSD

HSCSD (High Speed Circuit Switched Data) is a circuit switched protocol based on GSM. It is able to transmit data up to 4 times the speed of the typical theoretical wireless transmission rate of 14.4 Kbit/s, i.e. 57.6 Kbit/s, simply by using 4 radio channels simultaneously. A potential technical difficulty with HSCSD arises because in a multi-timeslot environment, dynamic call transfer between different cells on a mobile network (called ‘handover’) is complicated, unless the same slots are available end-to-end

²⁰ GSM Group, “The GSM family”, <http://www.gsmworld.com/technology/index.shtml>

²¹ ITU (2000) *3G Mobile Licensing Policy: GSM Case Study*;

<http://www.itu.int/osg/spu/ni/3g/casestudies/GSM-FINAL.doc>

GSM MoU Association - the global industry body that represents 239 international GSM network operators, regulators and administrators of 109 countries/areas

throughout the duration of the circuit switched data call. The second issue is that circuit switching in general is not efficient for data/Internet traffic.

GPRS

GPRS (General Packet Radio Service) is a packet switched wireless protocol that offers instant access to data networks. This enables services such as colour Internet browsing, e-mail on the move, powerful visual communications, multimedia messages and location based services. It permits burst transmission speeds of up to 115 Kbit/s (or theoretically 171 Kbit/s) when it is completely rolled out and provides an “always on” connection. More specifically, packet-switching means that GPRS radio resources are used only when users are actually sending or receiving data; available radio resources can be concurrently shared between several users. This efficient use of scarce radio resources means that large numbers of GPRS users can share the same bandwidth and be served from a single cell.

The analysts from *Analysis Research*²² forecasts that revenue from GPRS subscribers will grow from €28billion in 2004 and peak at €63billion in 2007, before declining, as customers move from GPRS to 3G.

EDGE

Enhanced Data Rates for Global Evolution (EDGE) is a higher bandwidth version of GPRS permitting transmission speeds of up to 384 Kbit/s. Deploying EDGE allows mobile network operators to offer high-speed, mobile multimedia applications (such as the downloading of video and music clips, full multimedia messaging, high speed colour Internet access and e-mail on the move).

EDGE provides an evolutionary migration path from GPRS to UMTS, implementing modulation changes which are necessary for UMTS. But the opportunity window for EDGE will be very short, unless major delays occur during UMTS deployment in some countries.

3G / UMTS

Third Generation mobile in the shape of UMTS (Universal Mobile Telecommunications System) with WCDMA (Wideband Code Division Multiple Access) as radio access technology is already a reality. It offers services such as high-speed data and video communications, voice calls, messages, photos, file downloads, music, news and video downloading/conferencing - all on a single, compact wireless device and with a single contact address/number.

The world's first commercial WCDMA network was launched in Japan in 2001. Nowadays, Europe licensing is largely completed. More than 98% of 3G licenses awarded so far (approaching 120 operators) specify WCDMA. Different European WCDMA networks are already operating commercially in Austria, Denmark, Germany, Greece, Italy, Netherlands, Portugal, Slovenia, Spain, Sweden and the UK with more

²² *Analysis Research* “Western European Mobile Forecasts and Analysis 2004-2009”, www.analysis.com

launches anticipated during 2004-2006. Lots of other pilot and pre-commercial trials are operational in the other European territories (See Appendix II).

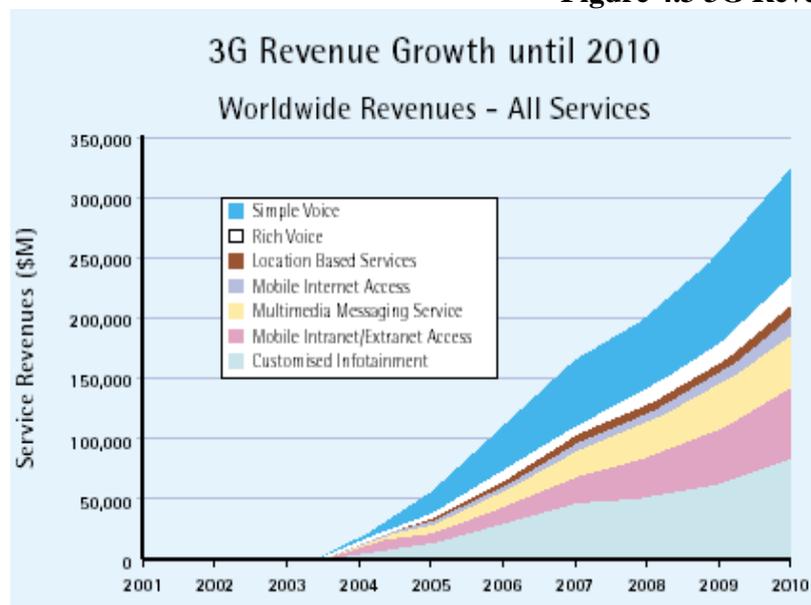
UMTS benefits for operators

1. *Network optimization.* UMTS builds on investments in GSM providing a network optimisation opportunity for operators. Operators can retain legacy 2G core network, IT and service platforms; and reuse existing sites and implement site sharing.

2. *Cheaper additional capacity.* UMTS gives operators additional capacity compared with 2G to support more subscribers (especially in urban centres) as well as greater speeds and ability to support new multimedia services. UMTS allows operators to add additional network capacity at a cost up to 8 times lower than providing incremental 2G capacity. This gives operators the opportunity to reduce the proportion of investments in relation to total turnover.

3. *Revenue increase.* UMTS may not in itself significantly increase Average Revenue Per User (ARPU) in the short term, but it will provide an opportunity for operators to strengthen their free cash flows. The largest revenue generators will be voice; personalised access to information and entertainment services ("infotainment"); mobile access to the Internet and corporate networks; and MMS. In addition Location Based Services and "Rich Voice" (an extension of normal voice communications that overlays the simultaneous transmission of photos, graphics, video, maps, documents and other forms of data) contribute to operator's revenues as well²³.

Figure 4.3 3G Revenue Growth

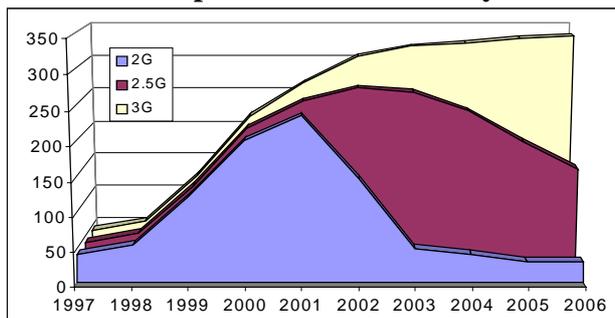


Source: UMTS Forum

²³ The UMTS Forum (2003) White Paper "Mobile evolution. Shaping the future"

Market analysts consider that initial growth of 3G subscribers will be relatively slow explaining it by the following factors: 3G networks are restricted to major built-up areas, operators have experienced problems in sourcing 3G handsets, and major operators are focusing on getting a return from their GPRS investments²⁴. The major growth is forecasted for the end of 2004 – beginning of 2006. During this time the amount of operators which launch UMTS for commercial exploitation will increase drastically together with subscribers' demand.

Figure 4.4. Western European Cellular Users by Technology, 1997-2006



Source: ITU

4.3. The main market players

The amount of market actors which have different positions and roles in the mobile telecom industry is increasing rapidly. Figure 4.4 illustrates simplified model of the mobile telecom industry value chain.

The mobile operator provides services to their customers either directly, or through a chain of service providers and retailers. Hence, it requires the equipment providers to supply the hardware and software infrastructure. The equipment providers, in turn, require the support of component manufacturers and contract manufactures of the hardware and software elements.

Figure 4.5 Mobile telecommunications value chain



Components Manufacturers

Components for mobile phones now account almost the largest portion of the mobile telecom market. The introduction of GSM has been one of the key drivers behind the

²⁴ Analysis Research "Western European Mobile Forecasts and Analysis 2004 -2009", www.analysis.com

innovation and advances in the semiconductor industry. The aspiration for more efficient, cheaper, smaller and more battery efficient mobile phones led to the use of large scale VLSI technology. This space-efficient technology has allowed major radio modules to be housed in miniature, microchip-scale packages.

There is a wide range of low cost component architectures used in mobile devices. The most configurable are the Digital Signal Processors (DSP), where the mathematics, algorithms and the techniques used to manipulate signals after they have been converted into a digital form, are implemented in software²⁵.

Equipment Providers

The most visible subsystem, within the Equipment Providers segment, is the **mobile handset**. From the beginning of 1990s mobile phones have evolved from a luxury item to an essential tool of business and social communications. According to *Deutsche Bank AG* research, nowadays there are 1.3 billion mobile handsets in use; almost 1 billion of which employ GSM (that is more than the total number of TVs and PCs combined).

The development and manufacture of mobile handsets has changed recently to the situation where, an increasing number of mobile devices are now developed by Original Design Manufacturers (ODMs). ODM is a growing phenomenon that has quickly influenced the mobile handset industry. Established GSM manufacturers such as Nokia, Sony Ericsson, Motorola and Siemens, more and more turn to sub-suppliers to minimise their risks and efforts in the process of maintaining and expanding their product portfolios. Sub-suppliers such as Arima, BenQ, Compal, GVC, HTC and Microcell, are obliged of their existence to mobile phones.

Hardware providers play one of the most important roles in mobile telecom industry. There are currently 616 networks GSM on air worldwide, each of them would require a large number of Base Transceiver Sites (BTS) and Base Station Controllers (BSC); Mobile Switching Centers (MSC) and Intelligent Networking platforms²⁶. There are not that much big market players, as rapid development and growth requires large investments both to research and manufacturing. The world's leading telecom equipment providers are Nokia, Motorola, Ericsson, Siemens, Alcatel and Lucent.

The evolution of the mobile telecom technologies and the advent of 3G enable access to enhanced services and improved technical capabilities and functionality, which, in turn, requires more advanced equipment and strong support from the equipment providers.

Software and content providers

The rapid development of the IT and **software** systems known as Operational Support Systems (OSS) and Business Support Systems (BSS) that run the mobile network operator's business is mostly driven by GSM growth in Europe. The emergence of the big amount of mobile network operators has stimulated the growth of independent software and integration companies, which produce a range of OSS/BSS systems, including Service Assurance, Subscriber and Service Provisioning, Customer Care to Mediation and Collection, Billing and Revenue Assurance. A large component of the

²⁵ Deutsche Bank AG (2004) "Telecommunications GSM White Paper"

²⁶ Ibid

revenues from OSS/BSS include the hardware sales, systems integration, consulting, and outsourcing by OSS/BSS vendors, in addition to the software licence.

Mobile **content** market is fairly saturated today and its profit potential grows incredibly with the advent of 3G. Most of the content providers offer a great variety of different services; however the highest revenue might be obtained from a few highly desirable offerings (the newest games titles, music and video clips, the first workable television service). Some mobile operators take relatively high risk approach of providing a complete mobile experience under their own brand (i.e. Vodafone), competing on the range and quality of their offering not just volume.

Mobile Network Operators

Mobile Network Operators (MNOs) obtain an exclusive position in the value chain. They can deliver person-specific rather than location-specific services. Consequently, they control the most personalized and value-added form of distribution of telecommunication services²⁷.

The huge task of staging a mobile network has fostered partnerships, co-operative agreements and some fairly surprising bedfellows, in order to share the costs of physical rollout of mobile networks and speed up time to market. The deployment of 616 GSM networks, and more than a million BTS sites throughout the world, has brought about a form of convergence between the owners of appropriate industrial real-estate assets and the Mobile Network Operator.

Network operators often share buildings, transmission sites, base station equipment, radio masts and antennae. These commercial arrangements improve the economics of deployment and have prompted some interesting revenue-sharing and cost reduction arrangements, including build operate transfer, shared wireless infrastructure and outsourcing capital expenses (Capex).

Retailers

End-users are able to buy mobile telecommunications hardware and services from two types of retail outlets: specialty outlets that may be branded by a mobile operator, or outlets that sell mobile telecom services and mobile devices as part of a broad range of products. Retailers play an important role in the sale and education about value-added services, different models of the mobile phones, tariffs, and may even help to stimulate increased traffic on the network.

European mobile telecom market is fairly saturated in terms of market penetration; consequently, mobile operators need to find new channels to market. This has resulted in a range of partnering between mobile operators and a host of retail organizations, as well as the development of new self-service retail formats such as multimedia mobile portals to reach the mass market consumer²⁸.

4.6. Danish Mobile Telecommunications Market Overview

In many aspects, Denmark has proved to be Europe's best practice case in telecommunication. The NMT (Nordic Mobile Telephone) network was the first mobile

²⁷ Deutsche Bank AG (2004) "Telecommunications GSM White Paper"

²⁸ Ibid

network to be deployed in Denmark, over which services began operating in 1982. With the introduction of GSM networks in 1992, the number of NMT subscribers gradually declined to under 35,000 in 2001²⁹. At present, there are five mobile operators in Denmark that own their own infrastructure: TDC Mobil, Sonofon, Telia Denmark, Orange and Hi3G.

In September 2001, 3G mobile licenses were sold in a sealed-bid auction to all GSM operators, with the exception of SONOFON. The sealed-bid auction has been chosen because of its advantages in terms of reducing the potential for collusion and possibilities for aggressive new entrants to outbid a conservative incumbent³⁰. In order to prevent tacit collusion for underbidding, the Danish government set a floor price 57 million USD. Finally the cost for the license paid by each operator estimated 118 million USD. According to coverage obligations 30% of the population should be covered by the end of 2004 and 80% by the end of 2008.

A new entrant, Hi3G, also bought a 3G license and today is the only one 3G mobile operator in Denmark, which has launched UMTS in commercial exploitation. The Hi3G project is a joint venture between the Swedish industrial holding company *Investor* and *Hutchison Whampoa*. In April 2004, the European Investment Bank (EIB) agreed to provide a loan of US\$233 million to *Investor AB* for the construction of a 3G network in Sweden and Denmark, one of the first stand-alone UMTS networks to be developed in Europe by a new entrant³¹.

Figure 4.6. Danish MNOs

Organization name	Network name	Licensed Service Area	Technology	Service Start Date
Hi3G Denmark ApS	3 DK	Denmark	3G	Oct 2003
Orange A/S	Orange A/S	Denmark	GSM 900/1800	Dec 1997
Sonofon	SONOFON	Denmark	GSM 900/1800	Jul 1992
TDC Mobil	TDC Mobil	Denmark	GSM 900/1800	Jul 1992
Telia Denmark	Telia DK	Denmark	GSM 1800	Jun 1997

Resource: GSM Group Europe

In order to increase competition in the mobile market, mobile number portability was introduced in July 2001. Mobile number portability allows a subscriber to change to another mobile provider and keep their original telephone number. According to the EU Commission it has been successfully taken up, with around 214 000 mobile numbers ported only from the start to July 2002. At the same time a charge information facility (a price guide) was established by the NITA in order to increase price transparency for end users³².

²⁹ ITU (2003) "Mobile overtake fixed. Implications for policy and regulation"

³⁰ Reuters, *Denmark Plans Sealed UMTS Auction*, TOTAL TELECOM (March 1, 2001)

³¹ *Cellular-news* (April 2004), 3G loan agreed (April 2004) <http://www.cellular-news.com/3G/denmark.shtml>

³² Tele 2 (2003) *The monopoly challenger. Presenting views on fixed telephony subscription, carrier pre-selection, MVNO and ADSL* (Presented to the European Commissioner for Enterprise and Information Society Erkki Liikanen, September 26, 2003)

4.7. The UK Mobile Telecommunications Market Overview

Public mobile telephony was first introduced to the UK in 1985 with the instigation of analogue Total Access Communications System (TACS) networks operated by Vodafone (then Racal-Vodafone) and O2 (then Cellnet). Prior to this BT had operated a 'radio-phone' service but its capacity was very limited and coverage was poor. One of the others portable licensed telephone services were 'telepoint' services such as *Rabbit*. These services allowed users to make but not receive calls when they were in areas with coverage. The lack of ability to receive calls together with the restricted coverage and high prices of such services eventually led to the commercial failure³³.

The next major step forward after TACS was the introduction of GSM in the early 1990s when O2 and Vodafone were granted licences (900 MHz). Further GSM licences, but at a different frequency (1800 MHz), were awarded in 1991 to Mercury, Unitel and Microtel, and O2 and Vodafone were later granted spectrum at 1800 MHz. The Unitel licence was surrendered and Unitel joined with Mercury, now T-Mobile, while Microtel was purchased by Hutchison Whampoa and was renamed Orange³⁴.

Today there are five mobile network operators in the UK: O2, Orange, T-Mobile, Vodafone and Hutchison (Hi3G).

Figure 4.7. The UK MNOs

Organization name	Network name	Licensed Service Area	Technology	Service Start Date
Hutchison 3G UK Ltd	3	UK	3G	May 2003
O2 (UK) Limited	O2	UK	GSM 900/1800	Dec 1993
Orange PCS Ltd	Orange	UK	GSM 1800 3G trial	Apr 1994 Feb 2004
T-Mobile (UK) Limited	T-Mobile UK	UK	GSM 1800 3G trial	Sep 1993 Feb 2004
Vodafone Ltd	Vodafone	UK	GSM 900/1800 3G	Jun 1992 Feb 2004

Resource: GSM Group Europe

The UK was one of the first countries in Europe to offer licences for UMTS. After seven weeks and 150 rounds of bidding by 13 companies, five companies (O2, Orange, T-Mobile, Vodafone and Hi3G) emerged victorious in their attempt to win a 3G license, and the auction raised £22.5 billion. Revenues were almost seven times more than originally expected³⁵. One type of the licenses was not available for incumbent operators and had national roaming rights, allowing access to Vodafone or O2's 2G infrastructure. It was bought for £4,4 billion by Hutchison (Hi3G) and O2 was elected for roaming

³³ Ofcom (2002) The UK Competition Commission's report on the charges made by mobile operators for terminating calls - 18 February 2003,

http://www.ofcom.org.uk/static/archive/ofcom/publications/mobile/ctm_2003/ctm2.pdf

³⁴ Ibid

³⁵ *3G Country Information*, FINANCIAL TIMES, Aug. 15, 2001

agreement³⁶. Mobile operators have to build their networks until 2007 and should be able to cover 80% of the population.

Recently³⁷ all British 3G licensees (O2, Orange, T-Mobile, Vodafone and Hi3G) began proceedings claiming back £3.9billion in VAT from the government. Lawyers acting for the operators will claim that the government sold the licences in a commercial capacity to maximise the revenues of the state. They believe the auction price - at least four times what analysts had been expecting - did include VAT which the operators can claim back.

British 3G licenses were almost the most expensive in the whole Europe and only the £30.5billion auction of licences in Germany in 2000 raised more cash than the British auction³⁸.

Portability of mobile numbers was introduced in the UK in January 1999. The fact that subscribers historically had to change their telephone number if they wished to transfer from one network operator to another was considered by the DGT to be a major obstacle to competition in the market for retail mobile services. As a result, conditions requiring the mobile operators to provide number portability were included in each of the mobile operators' licenses³⁹.

³⁶ Oftel (2002) The UK Competition Commission's report on the charges made by mobile operators for terminating calls - 18 February 2003,

http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2003/ctm2.pdf

³⁷ the 9th of February 2004

³⁸ Richard Wray "Mobile firms seek £4bn VAT refund", *The Guardian*, February 9, 2004

³⁹ Oftel (2000) Explanatory document: Mobile number portability determination requests, http://www.ofcom.org.uk/static/archive/oftel/ind_info/numbering/mnpdetre.pdf

5. MVNO business model

An MVNO is a concept that has emerged fairly recently in the mobile telecommunications industry and the market is still confused by the lack of a common definition of what can be considered as an MVNO. According to the definition made by the European Commission in the 1999 Communication Review “*MVNO is an mobile operator, which does not have a license to use radio spectrum, but has access to the radio infrastructure of one or more mobile operators and is able to offer services to customers using that infrastructure and its own network*”⁴⁰. NRAs are making attempts to find narrower definition, based on the minimum requirements such as issuance of own sim-cards or partly-owned infrastructure.

The first real steps in launching MVNO were taken by Scandinavian company Sense Communications in 1997. Sense established an MVNO agreement with Sonera in Finland, but its initial attempts to make similar arrangements in Sweden, Denmark and Norway failed. The company didn't manage to persuade host MNOs in attractiveness of such a partnership and regulatory authorities had no power to influence incumbent operators' decisions. Today, depending on the definition given of an MVNO, there are more than 60 “MVNO-type” operators that exist in Europe. The biggest amount of them is concentrated in the UK and Scandinavia and the most notable ones are Virgin Mobile and Tele 2 Denmark.

5.1. Types of MVNOs

The application of the term MVNO differs from country to country. British NRA, Ofcom (former Oftel), uses the term to cover activities undertaken by organisations that offer mobile services but do not issue their own SIM card, and Virgin Mobile UK, is often quoted as the first example of an MVNO in Europe although it does not issue (it rebrands) its own SIM card or operate its own mobile switching centre. In contrast Danish regulator (NITA) requires the issuance of a own sim-card, and Tele 2 Denmark is the brightest example of “pure” MVNO, which offers its own sim-card and code and is responsible for its roaming agreements and routing⁴¹.

Consequently MVNOs can take a variety of forms depending on the level of integration between the technical and commercial service provider roles. MVNOs can be classified into following three main categories:

- Basic Service Provider MVNO
- Enhanced Service Provider MVNO
- Full MVNO⁴²

⁴⁰ European Commission (1999), Towards a new framework for Electronic Communications infrastructure and associated services, COM (1999)539

⁴¹ Matthew Secker, The Right MVNO cocktail? *Telecommunications International*; May 2002; 36, 5; ABI/INFORM Global, pg. 16

⁴² EURESCOM Summit 2001 “3G Technologies and Applications”, *Arthur D. Little Int., Inc.*
http://www.eurescom.de/~pub/seminars/Summit2001/PartIV_MVNOs_final.PDF

	Service Provider (SP) ¹⁾	Enhanced Service Provider (ESP) ¹⁾	Mobile Virtual Network Operator ¹⁾
Access Network	• No Licence, No radio access network	• No Licence, No radio access network	• No Licence, No radio access network
SIM, NDC	• No own SIM card • No own NDC	• Possible own SIM • Possible own NDC	• Issues SIM-Cards • Own NDCs
Network Infrastructure	• No switching network • No HLR/AuC • Possibly own VAS platforms • Possibly own Customer Care and Billing (CCB)	• No switching network • Not full control of HLR/AuC • Possibly own VAS platforms • Own Customer Care and Billing (CCB) system	• Own switching network • Full control of HLR/AuC • Own VAS platforms • Own Customer Care and Billing (CCB) system
Pricing	• Own pricing, negotiation based	• Own pricing, negotiation based	• Own pricing
Branding	• Bundled branding ("powered by") • Possible own billing	• Independent branding, billing • High level of customer ownership	• Fully independent branding • Full customer ownership
Business Model	• Revenue structure – (Value Added) Reseller – Own services • Costs structure – Sales & Marketing – Distribution – Possibly investment in VAS platforms and CCB	• Revenue structure – (Value Added) Reseller – Own services • Costs structure – Sales & Marketing – Distribution – Possibly investment in SIM, HLR/AuC, VAS platforms and CCB	• Revenue structure – Air time, data, etc. – services • Cost structure – Sales & Marketing – Distribution – Radio access lease – Licence, NDC, etc. – Rest of network infrastructure

1) There are no unique, clear cut definitions for SP, ESP, or MVNO

Source: Arthur D. Little Int., Inc.

Basic Service Provider MVNOs simply resell bulk airtime from the operator and might rely almost totally on the mobile operator's facilities, and calls to and from its subscribers would be treated as if they were calls to the mobile network operator's own customers. However, the packaging and pricing of the service and control of the customer would rest with the MVNO. Such MVNOs would make minimal investment, possibly confined facilities for retailing, customer service and billing. Most MVNOs that have been created to date have fallen into the "skinny" category, relying heavily on the facilities of the underlying operator and seeking to differentiate themselves through marketing and retail campaigns⁴³.

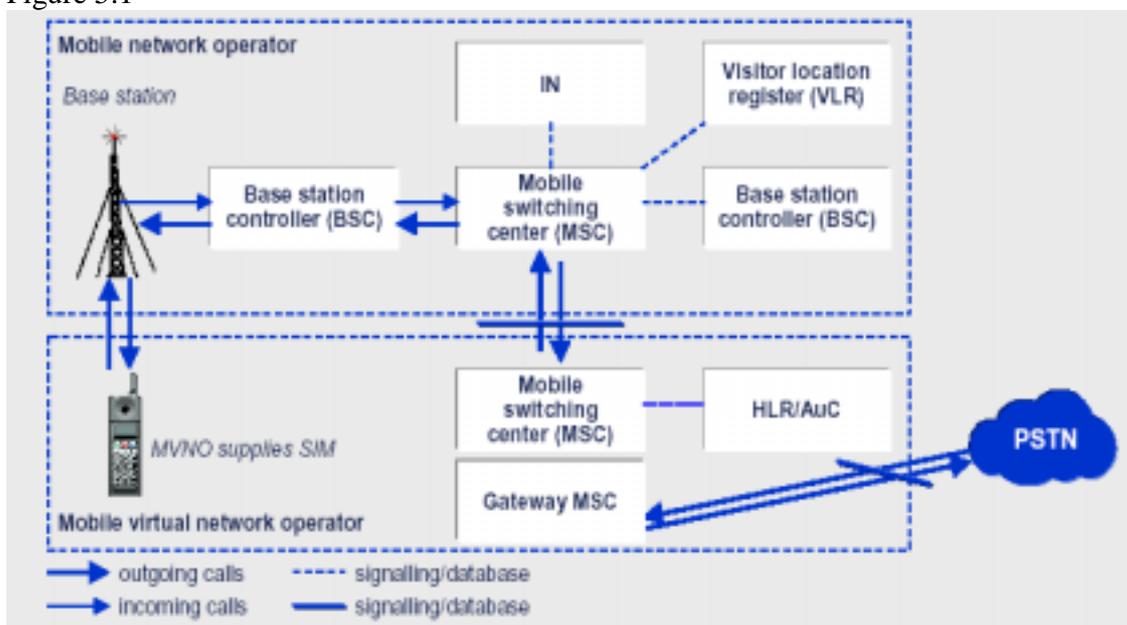
Enhanced Service Provider MVNOs may own some service platforms, and seeks to differentiate through having a service set that may differ from the host network, making the main impact on content- and service- portfolio. This type has independent branding and high level of customer ownership. However, this model provides limited service differentiation and service routing control⁴⁴.

⁴³ APEC Telecommunications and Information Working Group 23rd Meeting (2001), *Gilbert and Tobin Lawyers* Appendix A to Case Study 2: The Emergence of the Mobile Virtual Network Operator - Virtually Here

⁴⁴ Telos Technology (2002), MVNO White Paper, <http://www.phonevision.com.au/TelosWhitePapers/MVNO%20white%20paper.pdf> (01.04.04)

Full MVNOs own switching capacity and data transmission infrastructure and may be a full telco with interconnect facilities. This model requires the deployment of intelligent network (IN) services platforms and potentially gateway mobile switching centre (MSC) functions. However, this model offers substantially greater service differentiation compared to the other MVNO business models. Moreover, this approach offers better subscriber service routing control. The drawback of this method is the significantly higher capital outlay, and much greater technology complexities. The following figure illustrates MVNO “pure” model⁴⁵.

Figure 5.1



Note: IN = Intelligent Networking, PSTN = Public Switched Telephone Network, HLR = Home Location Register, AuC = Authentication Centre

Source: Arthur D. Little Int., Inc.

Apart from the technical approach MVNOs may be classified depending on the profile of the company:

- existing fixed-line operators in the same market;
- existing mobile operators in another market;
- non-telecom companies.
-

Chapter 5.2. describes possible benefits and risks of these MVNO models.

⁴⁵ Telos Technology (2002), MVNO White Paper, <http://www.phonevision.com.au/TelosWhitePapers/MVNO%20white%20paper.pdf> (01.04.04)

5.2. Driving forces for potential MVNOs

There are a number of different reasons explaining why non-telecom companies, existing mobile operators and fixed-line operators are interested in entering mobile telecommunication market as MVNO. One of the main driving forces for becoming an MVNO for new entrants is the high cost of obtaining frequency spectrum and deployment of network infrastructure.

For traditional **non-telecom companies**, the main driver to operate as MVNO is to leverage its existing strong brand into new high growth revenue areas. MVNOs with established non-communications consumer brands target end users in niche demographics, and specifically tailor their services to fit the "lifestyle" of their target users⁴⁶.

For **Fixed-line operators** it is a modest opportunity to expand into new businesses. They are able to use their existing customer base and gain an opportunity to offer a degree of mobility to their fixed network customers and reduce their cost base for calls made from and between countries in which they operate⁴⁷. This kind of operators may offer a combined fixed and cellular service with one tariff and one bill and discounted rates to customers who subscribe to both services.

Mobile operators which obtain primary spectrum licenses in other markets are willing to expand and may enter into MVNO commercial agreements either because they fail to win a 3G license in a desired market or because of their unwillingness or inability to become a primary spectrum licensee in new markets.

Innovative services package is one of the main factors for MVNO to succeed. Unlike traditional mobile operators, MVNO's are able to integrate their own value added platforms into their retail offering (by interfacing such platforms with the host network operator's network). These include additional services such as voicemail, pre-paid platforms and WAP gateways. This allows the MVNO to differentiate in the market by interfacing functionality that appeal to their target customers.

Most of the new entrants realize that a mobile telecommunications industry gives a high potential for additional revenues and are attracted by the prospect to participate in mobile boom. The main opportunities for MVNOs include:

- Faster and lower risk approach to entering and penetrating a market
- Differentiate and expand own services
- Covering a niche which MNOs do not serve
- Developing a sustained customer relationship
- Distribution of own content
- Cross selling to existing customer base
- Leveraging own distribution network

⁴⁶ Telos Technology (2002), MVNO White Paper, <http://www.phonevision.com.au/TelosWhitePapers/MVNO%20white%20paper.pdf> (01.04.04)

⁴⁷ Duke-Woolley, Robin "MVNO: Doing Business with the Enemy?" <http://www.e-principles.com/MVNO.htm> (02.04.04)

- Leveraging existing strong brand⁴⁸

But inevitably there are risks as well. Poor MVNO might be destructive to the whole brand and far all the businesses provided under this brand. That is why careful management is essential for companies considering an MVNO. It is crucial not to underestimate the impact that MVNO implementation could have on management and operations and to consider to what extent the MVNO should be integrated into the heart of the core business. More specific risks are based on the fact that MVNOs have to pay higher costs for network access than MNO. Thus, MVNOs need to be able to either generate more revenue or cut costs in a way that MNO cannot replicate. They are also not able to control network quality level and introduce additional competition into the market, driving margins down⁴⁹.

The main requirement for a new entrant is to be better in something than incumbent operator. It might be strong distribution channels, innovative value added content or services or technical competence for operation of MVNO.

5.3. Benefits and risks for incumbent operators

Some incumbent operators still see more threats in MVNO models than advantages. The basic conflict which host operators face by permitting access to their network is that they are permitting the creation of a competitor which will lead to a reduction in their subscriber base. However, the risk of cannibalisation is more possible for operators with a large customer base than ones with a small customer base. Small operators realize that the MVNOs they host are more likely to take market share away from larger operators than from the customer base of smaller operators such as themselves. That is why small operators are the most open to hosting MVNOs. They usually need additional revenues and have relatively low market share and often spare capacity to make available to third parties⁵⁰.

But large operators can also benefit from opening their networks to MVNOs if they have the necessary surplus capacity. The fact that MVNOs and MNOs often target different customer segments is critical in this case. MVNOs offer a way of addressing areas of the market which would not be reached by host operators as well as providing innovative services, branding and marketing expertise⁵¹. Another beneficial aspect is that traditional MNOs can broaden their customer base a zero cost of acquisition.

Richard Branson, chairman of Virgin Group Ltd is sure that “networks that fail to embrace the MVNOs will ultimately suffer”⁵². He also stressed that “network operators should leave the marketing, branding, creating and selling of user content and services to

⁴⁸ EURESCOM Summit 2001 “3G Technologies and Applications”, *Arthur D. Little Int., Inc.*
http://www.eurescom.de/~pub/seminars/Summit2001/PartIV_MVNOs_final.PDF (15.03.04)

⁴⁹ Ibid

⁵⁰ Andersen (2002) “Digital Content for Global Mobile Services” Final Report for the European Commission, DG Information Society

⁵¹ Ibid

⁵² Tele.Com (2001) “Conventioneer”. Magazine: Tele.Com, 2001-03-05

the MVNOs". But there are also other opinions on this issue. Bernd Eylert, secretariat of the UMTS Forum (London), said a "good case for letting other firms ride on an operator's own network might arise at a later stage but that network operators should initially concentrate on generating services themselves"⁵³. There is the fear that giving MVNO "first mover" advantage in the provision of profitable data services will mean the incumbent operator will become a "dumb pipe" starved of these extra revenues⁵⁴.

Current situation in the mobile telecommunication market shows that Richard Branson's view of MVNO concept is closer to the reality. Ordinary mobile operators have consistently struggled in understanding what their customers want. They have also generally proved poor at understanding what content will attract new subscribers. Consequently, using established companies as MVNO may be a profitable way of exploiting the knowledge of others, especially taking into account an evidence of multimedia services importance in future⁵⁵. The number of "win-win" agreements is increasing incredibly nowadays and more and more incumbent operators realize that MVNO may help to drive additional traffic and revenue from the existing spectrum and network infrastructure.

5.4. 3G environment

In the 3G mobile environment traditional mobile operators must carry a heavy financial burden because of expensive licenses, network construction and marketing costs. These market players have historically concentrated on selling a single voice product and now they need to develop, market, and package a much larger range of advanced applications. Offering the full range of mobile commerce, entertainment, banking, shopping, information, and other services from which the majority of 3G revenues will come, requires very different sets of skills and expertise. In order to meet this demand, access these markets, and maximize their 3G revenues, incumbent operators may have a strong incentive to offer their spectrum to MVNOs in order to share the costs and to serve specific market segments more efficiently and profitably⁵⁶.

There are three main areas of significant beneficial impact the existence of MVNO have on the development of the mobile telecommunications market and therefore on the maximization of revenues of host operator in a 3G environment:

Injection of funds into the mobile telecommunications market

One of the main barriers to mobile telecommunications market development that has is the fact that incumbent operators are often lack of funds to ensure the necessary

⁵³ Ibid

⁵⁴ Mc Dermott, Will & Amegy (2002) "MVNO and the US mobile market" http://www.mwe.com/index.cfm/fuseaction/publications.nldetail/object_id/133B96BB-881B-440E-A1F8-B1BCB9D3F50F (05.04.04)

⁵⁵ Ibid

⁵⁶ McKnight, Lee/Linsenmayer, Raymond/Lehr, William (2001) "Best effort versus spectrum markets: wideband and WiFi versus 3G MVNOs?" http://itc.mit.edu/itel/docs/2002/best_effort_v_spectrum.pdf (10.04.04)

investments for the deployment of services. Either because of increased competition for voice services cost of 3G licences or cost of network infrastructure deployment, some MNOs are under financial pressures that have created a commercial imperative to reduce costs and rapidly generate additional revenue. In this situation the role of MVNOs might be crucial as an injector of fresh capital into the market. They can partly ensure the role of commercial service provider which incumbent operators are having difficulties in fulfilling because of their financial constraints. By doing so, MVNOs will be able to invest in several areas which are considered as barriers to overall market development⁵⁷.

Development of innovative applications based on MVNOs core business

Most of the MNOs realize that different services and brands may be applied to the different customer segments. Incumbent operator can benefit from hosting MVNO which relies on its strong brand and targets more precisely specific customer segments. In addition to using the strong brands, value added services package is an important tool for MVNO to attract new customers. In 3G the huge number of data applications enables players providing the commercial service provision role to differentiate and leverage their knowledge in offline activities to develop innovative applications for the mobile environment. MVNO could become a customer gateway for any of the large categories of mobile data applications (m-payment, m-communication or m-content)⁵⁸.

Access to new distribution channels

In some cases MVNOs are able to leverage their network of existing distribution channels for the sale of mobile telecommunications services. For example retailers could use their network of shops to market services. An automobile manufacturer that becomes a traffic and travel focussed MVNO could use its network of car showrooms to sell its services. Banks focused on mobile payment applications could use their network of branches to market their services⁵⁹. Airline companies may use their broad network, selling mobile services directly to its airline customers.

It is evident that data traffic will be an important component of carriers' revenues in 3G environment. Voice traffic will only constitute about 8% of total traffic and cannot generate sufficient revenues to cover carriers' costs on its own⁶⁰. This emphasizes the importance of value added data services. Most traditional operators are not positioned to provide such services, and also it might be practically impossible for a single firm to provide the abundance of data services needed to sustain a 3G network and bear all the costs. Consequently, MVNOs is essential to the success of 3G systems.

⁵⁷ Andersen (2002) "Digital Content for Global Mobile Services" Final Report for the European Commission, DG Information Society

⁵⁸ Ibid

⁵⁹ Ibid

⁶⁰ McKnight, Lee/Linsenmayer, Raymond/Lehr, William (2001) "Best effort versus spectrum markets: wideband and WiFi versus 3G MVNOs?" http://itc.mit.edu/itel/docs/2002/best_effort_v_spectrum.pdf (10.04.04)

6. The Legal Framework

6.1 The way towards telecoms liberalisation.

Telecommunication sector is one of the most dynamic and innovative industries regulated by the EU. The number of operators which provide services in many countries is growing continuously, and these market players need to understand the multi-national regulatory framework in which they operate. The European telecommunications industry is now governed at international level (the International Telecommunication Union (ITU) and the World Trade Organisation (WTO)), the European Community level, and by national regulatory authorities (NRA) implementing the measures taken at the other two higher levels. Undeniably, the European Commission was the most dedicated proponent of liberalisation, and it used its powers with great skill to persuade other Community institutions to support this policy objective and further to insure that Member States implement EC legislation properly⁶¹.

During the 20 years since the first telecommunications action programme⁶² was put forward by the European Commission in 1984 the telecom scene has considerably changed.

The publication of the Commission Green Paper⁶³ in 1987 was the Union's first main move towards telecoms liberalisation. It proposed a European regulatory framework to help introduce competition into the telecommunications sector. The main proposals made in the Green Paper comprise the following issues:

- putting an end to national monopolies;
- gradually withdrawing the operation of the sector from state supervision;
- aiming at economies of scale by taking a pan-European approach to conditions of operability⁶⁴.

Since the publication of the Green Paper the Council of Ministers, European Parliament and Commission have worked at progressively lifting restrictions on Europe's telecoms infrastructure by adopting a great variety of Directives, Recommendations and Guidelines.

6.2 Legislation in Force

Full liberalisation arrived in 1998, but the regulatory package foresaw further evolution to a more competitive environment, requiring the European Commission to conduct a

⁶¹ Larouche, Pierre (2000) *Competition law and regulation in European telecommunications*, Oxford: Hart, 2000

⁶² Council Recommendation concerning the implementation of harmonization in the field of telecommunications (84/5491EEC), OJ 1984 L 298, p.49-50

⁶³ Green Paper on the Development of the Common Market for Telecommunications Services and Equipment (COM(87) 290)

⁶⁴ Ibid

review of the framework and how it should change in the light of market developments, new technology and changes in consumer demand.

A strong political impetus was given at the special European Council of Lisbon of March 2000. The need for Europe to achieve the growth and job potential of the digital, knowledge-based economy was emphasized. A prerequisite for this growth is that businesses and citizens must have access to an inexpensive, world-class communications infrastructure and a wide range of services.

In response to the conclusions of the Lisbon Summit, the new Electronic Communications Directive package was published in the EU's Official Journal on 24 April 2002, and came into force across the EU from 25 July 2003. It enables more flexible regulation of the mobile sector than before. The new regulatory framework improves competition and provides a predictable legal environment which enhances certainty for investors.

It gives a greater role to the European Commission through the possibility of exercising its veto right in two areas: definition of relevant markets and designation of operators with significant market power. Also it seeks more consistency in the application of regulation across Member States by requiring greater consultation between regulators and the EC.

6.2.1. Basic directives, Regulations and Decisions

The new package consists of five proposed EP and Council directives under Article 95: Directive 2002/19/EC on access to, an interconnection of, electronic communications networks and associated facilities (Access Directive⁶⁵), Directive 2002/20/EC on the authorisation of electronic communications networks and services (Authorisation Directive⁶⁶), Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (Framework Directive⁶⁷), Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive⁶⁸), Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications⁶⁹). The regulatory package also contains Commission directive under Article 86: Directive 2002/77/EC on competition in the markets for electronic services (Liberalisation directive⁷⁰); Decision 676/2002/EC on

⁶⁵ Directive 2002/19/EC on access and interconnection, OJ L 108, 24.4.2002, p. 7

⁶⁶ Directive 2002/20/EC on the authorisation of electronic communications networks and services, OJ L 108, 24.4.2002, p. 21

⁶⁷ Directive 2002/21/EC on a common regulatory framework, OJ L 108, 24.4.2002, p.33

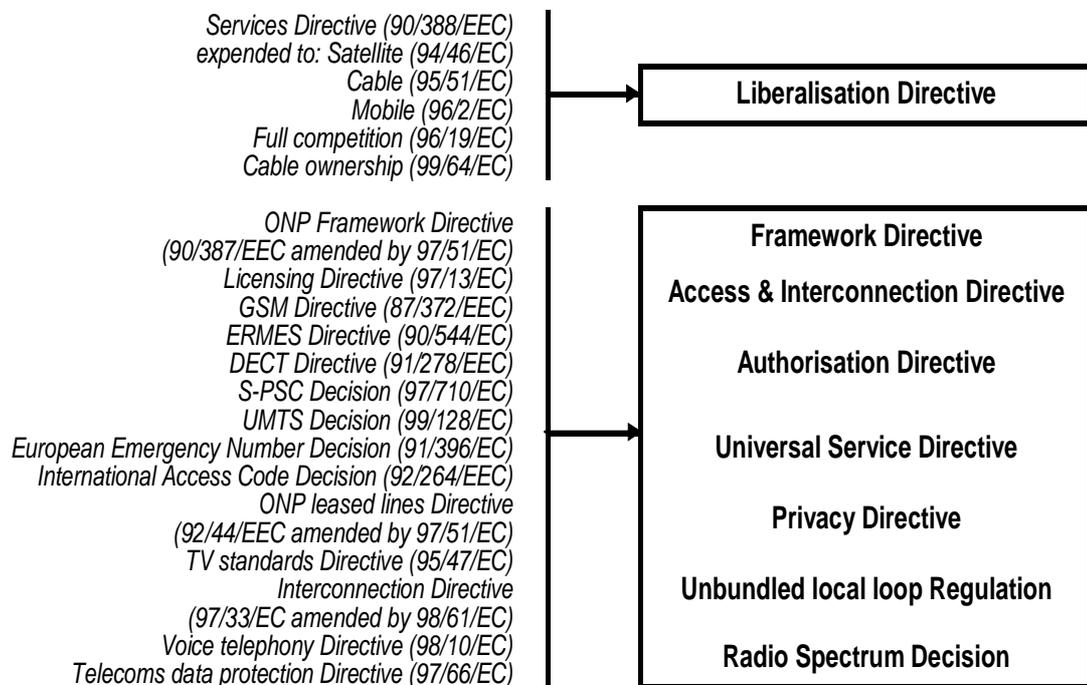
⁶⁸ Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, OJ L 108, 24.4.2002, p. 51

⁶⁹ Directive 2002/58/EC on data protection and privacy, OJ L 201, 31.07.2002, p. 37

⁷⁰ Directive 2002/77/EC on competition in the markets for electronic communications services, OJ L 249, 17.09.2002, p. 21

a regulatory framework for radio policy in the European Community (Radio Spectrum Decision⁷¹), and Regulation (EC) 2887/2000 on unbundled access to the local loop⁷².

Table 6.1. New Regulatory Framework



Source: EC / DG Information Society

The new package encompasses the policy objectives and regulatory principles, institutional provisions (i.e. National Regulatory Authorities (NRAs)), procedures (cooperation at EU level, regulatory process, consultations) and instruments of regulation.

The Framework Directive is the keystone of the new regulatory package which seeks to set out a harmonised framework for the regulation of electronic communication services, electronic communication networks and related facilities and services. It sets out a process for the definition and analysis of relevant product and service markets in the Member States⁷³. Article 15 (1) and 15 (2) requires the adoption of “Recommendation on relevant product and service markets” and “Guidelines on market analysis and the assessment of SMP” which are discussed further below.

The new Authorisation Directive replaces the Licensing Directive and aims to simplify and harmonise the rules and market conditions regarding the licensing or authorisation procedures. The main purpose of this directive is to ensure that operators who wish to provide electronic communications networks or services are not exposed to redundant

⁷¹ Decision 676/2002/EC on a regulatory framework for radio spectrum policy, OJ L108, 24.4.2002, p. 1

⁷² Regulation 2887/2000/EC on unbundled access to the local loop, OJ L 336, 30.12.2000, p. 4

⁷³ Directive 2002/21/EC (Articles 15 and 16)

constraints or difficulties in acquiring the relevant licences or authorisations. The Directive establishes “general authorisation” as the only legal right for provision of networks and services. It means that any person may provide services or establish networks unless this would jeopardize the general EU Treaty exceptions of "public policy, public security and public health". (The maximum that a Member State can require is that those wishing to provide networks or services notify their intention to the national regulatory authority. Any such notification should consist only of minimal identification information, a short description of the intended network and/or service and an estimated start date.)

The Access (and Interconnection) Directive aims to support new entrants in competing against dominant operators that control network infrastructure and basic network functions and allow operators to access each other’s networks on fair and non-discriminatory terms. “Access” is the term relating to accessing facilities and/or services, such as connection equipment, access to physical infrastructures, functionality systems, roaming access, etc; whereas “interconnection” is the physical and logical linking of public communications networks.

This Directive should help NRA’s to deal with existing and new challenging situations in the provision of networks and services. Main instruments of regulation concern obligations of non-discrimination, accounting separation, price control, cost accounting and detailed obligations of access to, and use of, specific network elements and facilities.

The Universal Service Directive defines the minimum set of services of specified quality to which all end-users should have access at an affordable price. It covers the issues of availability of universal service, affordability of tariffs and users’ control of expenditure, provision of public pay phones, special measures for disabled users, and quality of universal service. If the provision of universal service constitutes an unfair burden for the operator intended to provide the service the funding from State budgets or special financing schemes based on contributions from other service providers should be used.

Directive on privacy and electronic communications overriding aim is to take account of technological changes and to make the provisions as technology-neutral as possible. Main amendments concern provisions concern location data, unsolicited communications and directories of subscribers.

The Commission Liberalisation Directive replaces Commission Directive 90/388/EEC and combines its provisions, as revised while making further amendments, in the following areas: exclusive and special rights for electronic communications networks and electronic communications services; vertically integrated public undertakings; rights of use of frequencies; directory services; universal service obligations; satellites; cable television networks; mobile and personal communications. Article 13 of the Directive states that in regard to mobile and personal communications, Member States should not grant exclusive or special rights of use of radio frequencies and that “the rights of use of those frequencies should be assigned according to objective, non-discriminatory and transparent procedures”.

Radio Spectrum Decision is designed to promote the highest degree of harmonisation in management of the spectrum among EU countries necessary for the establishment and functioning of the internal market in Community policy areas such as electronic communications, transport and research and development⁷⁴.

The main aim of *the Regulation on unbundled access to the local loop* is to increase the level of competition and technological innovation in the local access network, which will in turn stimulate the competitive provision of a full range of telecommunication services. Unbundled access to the local loop means permitting any provider of telecommunications services to use the local telephone cables belonging, typically, to an incumbent operator to deliver services directly to customers, without at the same having to accept also other services that incumbents usually provide together (i.e. bundled) with the cable⁷⁵. Fair and non discriminatory conditions of access are essential for effectively opening the local loop on the development of a competitive market telecommunications services.

6.2.2. Recommendations and Guidelines

Article 15 (1) and 15(2) of the Framework Directive obliges the Commission to publish periodically recommendations on relevant product/service market definitions and guidelines on market analysis, which raise competition issues.

The current framework is supplemented by two measures covering market analysis procedure which are of particular interest: Commission Recommendation 2003/311/EC *on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC* and Commission Guidelines 2002/C165/03 *on market analysis and assessment of significant market power under the Community regulatory framework for electronic communications networks and services*

Recommendation on relevant product and service markets classifies products and services markets within the communications sector that have characteristics which justify the imposition of certain regulatory obligations set out in the Directive. These markets are defined in accordance with competition law principles and divided into two main types: markets for services or products provided to end users (retail markets), and markets for the inputs which are essential for operators to provide services and products to end users (wholesale markets). Within these two types of markets, further market distinctions are made depending on demand and supply side characteristics⁷⁶. Commission has identified 7 common product and service markets within retail level and 11 within wholesale level⁷⁷. NRA's are requested to analyse these 18 markets when defining markets within their territory. The list of relevant markets may not be exhaustive in the context of national circumstances, when justified by national circumstances; other markets can also

⁷⁴ Decision 676/2002/EC, *Article 1* (Aim and scope)

⁷⁵ Regulation (EC) 2887/2000, *Article 2* (Definitions)

⁷⁶ Recommendation 2003/311/EC (paragraph 6)

⁷⁷ Directive 2002/21/EC, Annex I

be identified by the NRAs, in accordance with the procedures set out in Articles 6 and 7 of the Framework Directive⁷⁸.

Guidelines on market analysis and the assessment of SMP are intended to direct NRAs in the exercise of their new tasks for defining markets and assessing SMP⁷⁹. The list of criteria to be used by NRAs in making an assessment of joint dominance is given in the Annex II of the Framework Directive and is discussed in details in these guidelines. The main subjects addressed by it are: market definition; assessment of SMP; SMP designation; and procedural issues related to all of these subjects⁸⁰.

Under the previous regulatory framework, NRAs had the power to designate undertakings as having SMP when they possessed 25% market share. There were the possibility to deviate from this threshold depending on the undertaking's ability to influence the market, its turnover relative to the size of the market, its control of the means of access to end-users, its access to financial resources and its experience in providing products and services in the market⁸¹.

Under the new regulatory framework, in contrast with the previous one, the Commission and the NRAs will rely on competition law principles and methodologies to define the markets to be regulated ex ante and to assess whether undertakings have SMP on those markets⁸². According to Article 14 (2) of the Framework Directive “*an undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position of economic strength affording it the power to behave to an appreciable extent independently of competitors customers and ultimately consumers*”. This definition is ascribed by the Court of Justice case-law to the concept of dominant position in Article 82 of the Treaty (“*a position of economic strength affording an undertaking the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers*⁸³”). Therefore, in applying the new definition of SMP, NRAs have to affirm that their decisions are in line with the Commission’s practice and in consistency with the relevant decisions of the Court of Justice and the Court of First Instance on dominance.

When correctly interpreted, the new regulations can lead to minimum regulation within the telecommunications sector and, at the same time, provide the efficient resolving of potential market problems.

6.3 Essential facilities doctrine

Essential facilities doctrine in its simplest approach stresses that a monopolist can be forced to sell a product or service when it is vital for another person’s business.

⁷⁸ Directive 2002/21/EC, article 15(3)

⁷⁹ Guidelines on Market analysis 2002/C165/03, recital 6

⁸⁰ Ibid, recital 8

⁸¹ Guidelines on Market analysis (Working document of the Commission), COM(2001)175

⁸² Guidelines on Market analysis 2002/C165/03, recital 5

⁸³ Case 27/76 *United Brands v. Commission*, [1978] ECR 207.

Nevertheless, the legal status of the doctrine is still indistinct and it has its believers and its doubters⁸⁴. In the EU, the European Court of Justice (ECJ) has developed the doctrine as a natural consequence of the general duty to deal or supply.

*Commercial Solvents*⁸⁵ case might be considered a starting point for the development of the doctrine. In this case the dominant supplier of a raw material used in the production of ethambutol (an anti-tuberculosis drug) decided to start production of ethambutol itself, and refused to continue to supply a customer (which had now become a downstream competitor) with the raw material. The ECJ found that *Commercial Solvents* was in breach of Article 82, and ordered the company to resume supplies. Further early cases concerning refusal to supply include *United Brands*⁸⁶, *BP*⁸⁷ and *Hugin*⁸⁸. In 1982 the ECJ followed its previous rulings in *British Telecom* decision⁸⁹, then a monopolist public telecommunications operator in the UK, had to provide access to the national switched infrastructure to a party providing ancillary services. In 1985 in *Telemarketing*⁹⁰, the ECJ had to rule on whether RTL television station abused its dominant position by refusing to broadcast telemarketing advertisements unless the phone number referred to therein was that of its telemarketing subsidiary. The Court identified the ability to broadcast this type of advertisements as a “service which is indispensable for the activities of another undertaking”.

*Volvo*⁹¹ and *Renault*⁹² cases also refer to “refusal to sell”, when both car manufacturers refused to license other manufacturers to make copies of car body parts, even for reasonable price. An example to supply a new customer is *Sabena*⁹³ decision, where Sabena airlines refused to supply a new customer access to its computer reservation system, unless it agreed to use the company’s ground-handling services, which was held to be an abuse.

*Magill*⁹⁴ was one of the significant cases for development of an “essential facilities” doctrine. The facts of *Magill* were that the right to produce weekly television magazine in Ireland was reserved by the broadcasters, who by refusing to license their daily listings to a third party publisher, prevented the latter from obtaining access to information that was necessary for the publication of a weekly television guide. In 1995 judgment the ECJ found “*exceptional circumstances*” that supported a finding that refusal to license the information to Magill was abusive: the absence of a valid substitute for Magill’s weekly programme, which was innovative product in Ireland; the absence of any objective justification for the refusal; and the fact that the “appellants reserved to themselves the secondary market of weekly television guides by excluding all competition on that

⁸⁴ Barry Doherty (2001) “Just what are essential facilities?” *Common Market Law Review*, Iss38, pp. 397-436

⁸⁵ Joined cases 6,7/73, *Commercial Solvents v. Commission*, (1974 ECR 223)

⁸⁶ Case 27/76, *United Brands v. Commission*, (1978 ECR 207)

⁸⁷ Case 77/77, *Benzine en Petroleum Handelsmaatschappij BV v. Commission* (1978 ECR 1513)

⁸⁸ *Hugin/Lipton*, OJ 1978 L22/23, (1978 1 CMLR D19)

⁸⁹ *British Telecommunications* (Dec. 82/861), OJ 1982 L360/36

⁹⁰ Case 311/84, *CBEM telemarketing v SA CLT*, 1985 ECR 3261

⁹¹ Case 238/87, *Volvo AB v. Eric Veng, (UK) Ltd* (1988 ECR 6211)

⁹² Case 53/87, *CIRCA v. Renault*, (1988 ECR 6039)

⁹³ Commission Decision 88/589/EEC, *IV/32.318, London European - Sabena* OJ 1988 L 317

⁹⁴ Cases T-69, 60, 76/89, *ITP, BBC and RTE v Commission* OJ 1989 L78/43; upheld on appeal, cases C-241 and 242/91P, *RTE & others v Commission* 1995 ECR I-743

market since they denied access to the basic information which is the raw material indispensable for the compilation of such a guide⁹⁵. The last of these exceptional circumstances induced many commentators to assert that the ECJ in fact endorsed the “essential facilities” doctrine, even if didn’t mention it⁹⁶.

However, the term “essential facility” was first used by the Commission in its decision in the *B&I – Sealink case*⁹⁷ and *Sea Containers v Stena Sealink*⁹⁸ case, in which the Commission held that a car and passenger ferry operator infringed Article 82 by refusing competitors access to the port facilities that it owned. The European Commission has defined an essential facility as “a facility or infrastructure, without access to which competitors cannot provide services to their customers, and which cannot be replicated by any reasonable means”⁹⁹. The Commission developed this ruling in two further decisions concerning ports, *Rödby*¹⁰⁰ and *Morlaix*¹⁰¹.

Later decisions have taken a more limited view of the application of the essential facilities¹⁰². In *Ladbroke*¹⁰³ case the Court of First Instance (CFI) stated that “the refusal to supply the applicant couldn’t fall within the prohibition laid by Article 86 (now 82) unless it concerned a product or service which was either essential for the exercise of the activity in question, in that there was no real or potential substitute, or was a new product whose introduction might be prevented, despite specific, constant and regular potential demand on the part of consumers”¹⁰⁴.

In *European Night Services case*¹⁰⁵ the CFI ruled that an undertaking may not be regarded as possessing infrastructure, products or services which are ‘necessary’ or ‘essential’ for entry to the relevant market unless such infrastructure, products or services are not interchangeable and unless, by reason of their special characteristics - in particular the prohibitive cost of and/or time reasonably required for reproducing them - there are no viable alternatives available to potential competitors of the joint venture, which are thereby excluded from the market¹⁰⁶.

The same cautionary approach is visible in *Bronner*¹⁰⁷. The test of indispensability is objective, and is not based on the needs of the particular company requesting access. In *Bronner* decision the Court said that there are no “technical, legal or even economic

⁹⁵ Cases C-241 and 242/91P, para 54, 55, 56 (1995 ECR I-743)

⁹⁶ Larouche, Pierre (2000) Competition law and regulation in European telecommunications, Oxford: Hart, 2000

⁹⁷ *B&I – Sealink case*, 1992 5 CMLR 255

⁹⁸ *Sea Containers Ltd. V Stena SeaLink Ports & Stena Sealink Line* (Case IV/34.689), OJ 1994 L15/8

⁹⁹ *Ibid*

¹⁰⁰ *Port of Rödby v Denmark*, 1994 OJ L55/52. (19994 5 CMLR 457)

¹⁰¹ *Morlaix (Port of Roscoff)*, (1995 5 CMLR 177)

¹⁰² Craig, P., de Burca, G. (2003) “EU law: text, cases and materials”, p 1016

¹⁰³ Case T-504/93, *Tierce Ladbroke v Commission*, (1997) ECR II-923, (1997 5 CMLR 309)

¹⁰⁴ Case T-504/93, para 131

¹⁰⁵ *Cases T-374/94, T-375/94, T-384/94 and T-388/94*, 1998 ECR II-3141

¹⁰⁶ *Joined cases T-374/94, T-375/94, T-384/94 and T-388/94* (para 208, 209) and *Joined Cases C-241/91 P and C-242/91 P RTE and ITP v Commission*,(para 53, 54) 1995 ECR I-743 and *Case T-504/93 Tierce Ladbroke v Commission*, (para 131) 1997 ECR II-923

¹⁰⁷ *Case C-7/97*, 1998 ECR I-7791

obstacles which make it impossible for any other publisher of daily newspapers to establish, alone or in cooperation with other publishers, its own nationwide home-delivery scheme and use it to distribute its own daily newspapers”¹⁰⁸. Hence, the facility that is desirable is not necessarily essential. In this judgement the ECJ continued to avoid using the term “essential facilities”, approaching the reference question as being one about refusal to supply¹⁰⁹, and clarified that under Article 82, a company should not lightly be required to assist its competitor. The ECJ defined three main criteria (*Bronner criteria or exceptional circumstances*) to show an abuse:

1. The refusal must be likely to eliminate all competition from an undertaking
2. The refusal cannot be justified objectively, and
3. The product in question must be indispensable to carrying on the asker’s business inasmuch as there is “no actual or potential substitute in existence”.¹¹⁰

Bronner is evidently not the last word on essential facilities. There are still some problems (like pricing or the role of competition authorities in essential facilities scenarios) which were not addressed in this case¹¹¹.

The Commission applied the ECJ’s restrictive approach in the *Info-Lab*¹¹² decision. The Commission held that the company didn’t have dominant position, and even if it had, the *Bronner* exceptional circumstances didn’t pertain in this case.

The ECJ most recent judgement¹¹³ on *IMS Health* case¹¹⁴ has also referred to *Magill* and *Bronner criteria*, stating that the exercise of an exclusive right may, in exceptional circumstances, give rise to abusive conduct. “In order for the refusal by an undertaking which owns a copyright to give access to a product or service indispensable to carry on business to be regarded as an abuse, three conditions must be fulfilled:

- the undertaking which requested the licence must intend to offer new products or services not offered by the owner of the copyright and for which there is a potential consumer demand;
- the refusal cannot be justified by objective considerations, and
- the refusal is such as to reserve to the copyright owner the market for the supply of data on sales of pharmaceutical products in the Member State concerned by eliminating all competition on that market”¹¹⁵.

Essential facilities in the mobile telecommunication sector

¹⁰⁸ *Case C-7/97*, para 44

¹⁰⁹ Jones A., Sufirin B. (2001) “EC Competition Law. Texts, Cases and Materials”, p. 416, Oxford University Press

¹¹⁰ Barry Doherty (2001) “Just what are essential facilities?” *Common Market Law Review*, Iss 38, pp. 397-436, *Case C-7/97*, para 41

¹¹¹ *Ibid*

¹¹² Case IV/36431, Competition Policy Newsletter, 1999, No 1, 35

¹¹³ JUDGMENT OF THE COURT (Fifth Chamber) 29 April 2004 in Case C-418/01, available at <http://www.curia.eu.int>

¹¹⁴ Case T-184/01R *IMS Health Inc v Commission* and Case C481/01 P(R) *NDC Health Corporation v IMS Health Inc. and Commission* 11 Apr 2002, OJ L 1, 4.1.2003, p. 1, OJ L 59, 28.2.2002, p. 18, OJ C 250, 18.10.2003.

¹¹⁵ The ECJ judgement in case C-418/01 29 April 2004

In the EC competition law, the “essential facilities” principle has been applied in a wide variety of different industries. In mobile telecommunication sector this doctrine is becoming particularly relevant as deregulation has made the issue of third party access very important¹¹⁶. The Commission in its *Guidelines on the application of EEC competition rules in the Telecommunication sector*¹¹⁷ said that refusal to provide reserved services (i.e. services for which a telecommunications company still has a monopoly) would be unlawful when it would make it impossible or difficult for competitors to provide non-reserved services.

The Commission’s *Notice on the application of the competition rules to access agreements in the telecommunications sector*¹¹⁸ emphasizes the importance of “essential facilities” doctrine and gives comprehensive guidelines on how it should be used in the telecommunications environment. It stresses that the balance between the rights of those requesting access and those who have to give access is the crucial point in any “essential facility” concept. It also states in its preamble the objective "to create greater market certainty and more stable conditions for investment and commercial initiative in the telecoms and multimedia sectors..." and "to explain how competition rules will be applied in a consistent way across the sectors involved in the provision of new services, and in particular to access issues and gateways in this context."¹¹⁹

The new regulatory package for telecommunication industry provides important tools for regulating access to network facilities, which encompass “essential facilities” for new entrants. The role of sector-specific regulations shouldn’t be underestimated, but it should be taken into account that telecommunications industry is one of the most dynamic and unconventional industries in the world. There is an evidence of growing number of cases which may not be covered by any sector specific regime (which cannot plan for all possible situations of innovation) and therefore they should be treated under general competition law (which by definition is cross-sector). The future development of the "essential facility" doctrine under competition law will be a natural consequence and one response to the challenge of convergence¹²⁰.

6.4. MVNO’s regulatory aspects

The provision of access to mobile virtual network operators (MVNOs) remains one of the most controversial issues within the European Union. It is not mandated by the current regulatory framework, but new Telecommunications Package provides specific actions for mobile operators obliging existing mobile operators to unblock the access to the existing networks to MVNOs¹²¹.

¹¹⁶ Bellamy, C.W., Child G.D., Roth, P.M. (2001) “European Community Law of Competition”, 5th edition, Sweet&Maxwell, p.741

¹¹⁷ O.J. No C 233/2, September 6 1991

¹¹⁸ O.J. No C 265/2, August 22, 1998.

¹¹⁹ Ungerer, H (1998)“Ensuring Efficient Access to Bottleneck Network Facilities. The Case of Telecommunications in the EU” http://europa.eu.int/comm/competition/speeches/text/sp1998_056_en.pdf (10.04.04)

¹²⁰ Ibid

¹²¹ Directive 2002/19/EC, Articles 2, 12

6.4.1. Regulatory aspects

Most regulating bodies are in favour of MVNOs since they encourage competition and that means lower prices and greater choice for consumers. But regulators in many countries are still considering whether (and if so to what extent) regulatory intervention, including the regulation of access price and conditions is necessary. The issue of MVNO regulation remains polemical and there are various arguments both for and against MVNO regulation.

Arguments against regulatory intervention are relied on the concept that the mobile market is competitive by nature and therefore does not require regulation. Mobile operators often refer to investments in networks as the focal reason why they should be allowed exclusivity. It is argued that regulated supply to MVNOs is likely to reduce investments if NRAs set supply price too low¹²². GSM Europe group¹²³ stresses that Europe's spectacular achievements in mobile has been driven by high-risk investment by competing operators. The concept of consumer choice in mobile depends on the motivation of operators to invest and innovate. "If these operators' networks are simply opened up to new players that piggyback on the work of others, then what is the incentive for new investment"¹²⁴. It has been also argued that mandated access may lead to less choice and lower quality. Such a critical approach to access is deeply rooted in the old world of national, incumbent, fixed-line monopolies. But the regulatory tools that worked successfully in that time are completely inappropriate in the dynamic, highly competitive world of telecommunications where mobile markets have reached a degree of maturity¹²⁵.

Those in favour of regulation argue that the mobile network operators control the available radio spectrum, which is a bottleneck facility and an entry barrier for new mobile network operators. European mobile telecommunications market has a strong need for further competition. There are still high tariffs for calls to mobile telephones and the European market is still controlled by few operators. *Tele2* considers that the main reason for this situation is the limited number of mobile operators in each country and also the lack of harmonization around the Member States of the European Union that creates huge obstacles for pan-European operators¹²⁶. The MVNO concept enables more operators to be present on a market, whilst not pushing unnecessary burden onto the operations of the holders of licensed mobile spectrum. This concept is supported by various operators as providing a win-win solution. This solution is also a way to enhance the network utilisation of the third and/or the fourth operator in the member states which are rarely utilised in an optimum way. The introduction of an MVNO business model

¹²² Lewin, David (2001), MVNOs - competition policy and market development, ITU workshop on 3G mobile http://www.itu.int/osg/spu/ni/3G/workshop/presentations/lewin_1.pdf (09.01.04)

¹²³ GSM Europe is the European interest group of the GSM Association. GSM Europe represents around 143 operators in 50 countries/areas in Europe and counts around 416 million subscribers.

¹²⁴ GSM Europe Group <http://www.gsmworld.com/gsm europe/faq/tariffs.shtml> (25.03.04)

¹²⁵ Ibid

¹²⁶ Tele 2 (2003) The monopoly challenger. Presenting views on fixed telephony subscription, carrier pre-selection, MVNO and ADSL (Presented to the European Commissioner for Enterprise and Information Society Erkki Liikanen, September 26, 2003)

should be seen as an indispensable mean for improving competition in the mobile sector¹²⁷. Service competition through MVNOs can be effective in reducing end-user tariffs, particularly for high-margin services like international calls and offer to the consumer the availability of a greater choice of tariff packages. Access to mobile networks for MVNOs, therefore, on reasonable terms is attractive in terms of promoting competition and consumer choice¹²⁸.

MVNO model is getting more attractive with UMTS entrance. Incumbent mobile operators may embrace MVNO as a means of deriving revenue to offset the enormous cost of building 3G networks. 3G MVNOs lead to more service competition and greater innovation. But without regulatory support 3G MVNO will be not able to enter the market for the long term: good negotiated supply conditions possible in short term (while MNOs want to fill their networks) but long term MNOs will raise prices to drive MVNOs from the market and take full end user revenues¹²⁹.

It is evident that mobile network operators are less likely to provide MVNO access unless it is a regulatory requirement. The history shows that proper regulatory framework might be crucial for NRAs in making their decisions.

The first attempts to establish MVNOs took place in Scandinavia and involved *Sense Communications* in late 1997. Sense established an MVNO agreement with *Sonera* in Finland, but its initial attempts to make similar arrangements in Sweden, Denmark and Norway failed. Sense tried to exploit EU regulatory provisions that require networks with SMP to grant new networks direct interconnection. In Sweden, the regulator supported Sense's position, but did not have the power to force *Telia* to enter into an MVNO arrangement. In Denmark, the regulator determined that Sense was not itself a network and therefore had no rights to interconnect. Sense was in the process of appealing against this decision when it was declared bankrupt¹³⁰.

Similar situation had been noticed with *Tele 2* in late 2002. Austrian NRA had rejected a request for interconnection "*for the purposes of providing services as an MVNO*", on the grounds that the current Austrian legislation did not allow for this possibility, although the regulator indicated it would welcome a change in the law in this respect.

The same decision was made by the French regulator ART, which had rejected *Tele2's* request to access *Orange's* mobile network arguing that such an obligation for incumbent MNOs did not apply to the current French telecommunication laws, but had, nonetheless, invited *Tele2* to keep lobbying and defending its project in French legislation according to new directives¹³¹.

¹²⁷ Ibid

¹²⁸ Irish Competition Authority, Joint Response to Consultation on the European Commission's Draft Recommendation on Relevant Product and Service Markets within the Electronic Communications sector http://www.tca.ie/decisions/submissions/s_02_003.pdf

¹²⁹ Lewin, David (2001), MVNOs - competition policy and market development, ITU workshop on 3G mobile

¹³⁰ Sense Communications International AS, Input to the 1999 Communications Review <http://europa.eu.int/ISPO/infosoc/telecompolicy/review99/comments/sense3c.htm#Lars%20Trygve%20Jenssen>

¹³¹ ART (2002), Press Release n°02-1192, "Ruling on a dispute between *Tele2 France SA* and *Orange France*"

6.4.2. The impact of Access Directive on MVNOs

“*Refusal to deal / denial of access*” is one of the main problems for the market entry by Mobile Virtual Network Operators. MVNO issues are expected to be harmonized on the European level with the help of new regulatory framework (especially Access directive 2002/19/EC) and recommendations issued by the Commission.

Article 12 of the Access Directive enables NRAs to “*impose obligations on operators to meet reasonable requests for access to, and use of, specific network elements and associated facilities, inter alia in situations where the national regulatory authority considers that denial of access or unreasonable terms and conditions having a similar effect would hinder the emergence of a sustainable competitive market at the retail level, or would not be in the end-user's interest (...) Operators may be required, inter alia:*

- *to give third parties access to specified network elements and/or facilities, including unbundled access to the local loop;*
- *to negotiate in good faith with undertakings requesting access; (...)*

This means that NRAs are able to monitor incumbent operators involved in MVNO commercial negotiations and intervene to settle any disagreements if called upon by one of the parties.

This new framework establishes a clear and firm framework for the national regulations. Currently the implementation and interpretation by the Member States is critical. In autumn 2003 the Commission opened infringement proceedings against Belgium, Germany, Greece, Spain, France, Luxembourg, the Netherlands and Portugal for failure to notify transposition measures¹³². By the begging of 2004 only 10 Member States has implemented current regulations. Erkki Liikanen, Commissioner for Enterprise and the Information society, said: “Following liberalisation of the European telecommunications markets in 1998, which has driven growth and innovation and the widespread availability of services to the public, the Commission now regards it as a priority to encourage timely transposition of the new framework for electronic communication. In addition to providing the legal predictability and regulatory flexibility necessary for continued investment in the sector, this will complement the *eEurope* objective of achieving competitive local access for internet services over broadband networks as cheaply as possible on a sustainable basis¹³³.”

In its Communication “Electronic Communications: the Road to the Knowledge Economy”¹³⁴, the Commission has stressed the importance of full, effective and timely implementation of the new regulatory framework for electronic communications. The

¹³² Electronic Communications: European Commission launches infringement proceedings against eight Member States, IP/03/1356

¹³³ Ibid

¹³⁴ COM(2003) 65 of 11.2.2003

aim is to create and maintain a competitive environment that offers incentives to innovate, invest, and improve the quality of the services offered¹³⁵.

The Commission emphasized that it is essential to complement formal infringement proceedings by alternative means to achieve rapid results when monitoring the application of community law. Alternative means of problem solving sometimes may be even more efficient than infringement proceedings. In this regard the Commission is closely working together with the Member States' authorities and in particular with the independent NRAs. Such co-operation already takes place in the Communications Committee (COCOM) and the European Regulators Group (ERG) as well as in the Radio Spectrum Committee (RSC) and the Radio Spectrum Policy Group (RSPG), but also in bilateral meetings with the Member States¹³⁶.

The Commission states in its latest Spring Report¹³⁷ that Member States who have not yet fulfilled their regulatory obligations should ensure complete and effective implementation in 2004.

6.4.3. Regulatory regimes in Denmark and the UK

The new regulatory framework was implemented by the UK in time and is reflected at the second part of the *Communications Act (Communications Bill)*. British national regulator OFTEL (replaced by OFCOM) was the first NRA which raised the issue of MVNO concept in 1999¹³⁸. OfTel considered that mandating MVNOs was not justified considering the state of competition in the broad mobile sector, but it appears willing to allow networks to reach voluntary commercial agreements with MVNOs.

Denmark was one of the first countries which implemented the new regulatory package. The liberalisation of the Danish telecommunications market has made Denmark one of the world's most competitive telecommunications markets. In the liberalisation process, the Danish NRA, the National IT and Telecom Agency (NITA), has taken a more active role. In July 2000 NITA took revolutionary measures by putting mobile operators on an equal regulatory footing with fixed operators. Denmark was the first Member State to open the door to those mobile service providers without spectrum who wanted to take on the GSM incumbent. By eliminating the legal distinctions between fixed and mobile networks, the Danish regulator accorded MVNOs the right to national roaming across all networks and a right to interconnect on commercial terms with operators that had significant market power¹³⁹.

¹³⁵ Electronic Communications: European Commission launches infringement proceedings against eight Member States, IP/03/1356

¹³⁶ Ibid

¹³⁷ Connecting Europe at high speed: recent developments in the sector of electronic communications, COM(2004) 61 (01)

¹³⁸ Mobile Virtual Network Operators: OFTEL inquiry into what MVNOs could offer consumers, July 1999

¹³⁹ European Commission (2002), 8th Report on the Implementation of the Telecommunications Regulatory Package

Conclusions

Nowadays, most of the regulatory authorities realize the importance of MVNO concept as it helps to ensure sustainable competition on the mobile telecom market. The EU new regulatory framework on telecommunications supports potential entrants seeking access to mobile network. Under this framework, the MVNO issues are regulated on national level and NRAs have broad margin of discretion in this regard as long as they comply with the requirements of Article 8 of the Framework Directive. According to Article 5 of the Access Directive, the NRAs have not only the possibility but also the duty to resolve disputes between MVNOs and incumbent operators and, where required, to impose measures.

Concerning the essential facilities doctrine, there might be some difficulties, especially in the light of *Bronner criteria* and recent judgements. There are competing mobile networks (licensees) in all Member States, which could provide the relevant wholesale access. Therefore network capacity of one particular mobile operator might not be regarded as indispensable, since MVNO is able to ask access to another network (which might be regarded as a substitute). However, if all mobile network operators refused to negotiate, this could indicate the existence of a collective dominance (the criteria is given by the CFI in the *AirTours* case¹⁴⁰) and in this case MVNO is protected by the EC law.

http://europa.eu.int/information_society/topics/telecoms/implementation/annual_report/8threport/finalreport/com2002_0695en01.pdf (05.02.04)

¹⁴⁰ Case T-342/99 *Airtours plc v Commission of the European Communities*, Judgment of the Court of First Instance (Fifth Chamber, extended composition) of 6 June 2002, European Court reports 2002 Page II-02585

7. ANALYSIS

7.1 Five forces

The aim of this analysis is to examine the attractiveness of mobile telecom industry and profit potential for traditional operators and MVNOs. It should be mentioned, that competitive forces' impact and profit potential are diverse for the different strategic groups within mobile telecom industry. Porter defines a strategic group as "*the group of firms in an industry following the same or a similar strategy along the strategic dimensions*"¹⁴¹. Strategic groups may differ in marketing, distribution, organisational structures, etc. Before defining main strategic groups within the industry it is essential to understand *what degree of strategic difference is important* and if this difference *significantly affects the structural position of the firms*¹⁴². For the purpose of this thesis, mobile operators are divided into two main strategic groups: MNOs and MVNOs.

7.1.1 Threat of new entrants

Entry barriers depend on the concrete strategic group that the new entrant is going to join. The main factors, which create obstacles for potential market players in joining MNO and MVNO strategic groups, are examined below.

Capital requirements

The capital requirements for potential MVNO depend on the business model chosen by the new player. Basic Service Provider MVNO needs minimum infrastructure investments. The majority of the investment required under this MVNO business model is for sales channel development, customer relationship management (CRM) applications, and billing management applications. Enhanced service provider MVNO incurs additional capital investments since it may own some technical platforms. The most "aggressive" pure MVNO model requires the highest investments, as this MVNO model deploys gateway MSC as well as Intelligent Network platforms.

But the situation is completely different for traditional network operators which have to construct the whole network infrastructure and pay for the license. It requires a large commitment to highly technical and sophisticated equipment and software, which need highly trained employees, and which require scarce resources to operate.

Economies of Scale

Economies of scale exist in the provisioning of telecommunications services for the same reasons they exist in other industries. General and administrative costs, such as corporate overhead and billing will decrease with increased production volume. In MVNO models the price depends on volume also in a way of possible price reduction offered by host mobile operator for bulk-minutes (discounts based on volume), which is usually negotiated in particular contract between MVNO and host operator. Traditional operators

¹⁴¹ "A strategic group is the group of firms in an industry following the same or a similar strategy along the strategic dimensions." (Porter, M. E. (1980), p.129)

¹⁴² Porter, M. E. (1980) "Competitive Strategy. Techniques for Analyzing Industries and Competitors", The Free Press, p.132

gain more benefits from the economy of scale. Network costs from maintaining and building cell sites, switches and network operations centres have to be spent, regardless of how many customers are connected. Once the main network is in place, the costs of servicing each additional user represent only a fraction of total costs with the growth of the customer base¹⁴³. The problem for potential entrant is that it can never match up to the operating scale of an incumbent due to the long lead period the latter has.

Governmental and Legal Barriers

Not long ago national regulatory authorities didn't have any power to protect the rights of potential MVNO to access mobile network. But nowadays the situation has changed drastically. National regulators and the EU institutions realize the importance of competition in telecom industry and are in favour of MVNO concept. New regulatory framework on telecommunications makes it possible for NRA to monitor and control the relationships between incumbent operators and potential entrants, which are willing to enter into commercial agreement. Some regulators (Ireland, Sweden and Denmark) have mandated access of MVNOs to 3G network, requiring incumbent operators which obtain the license to be open for full MVNO activity.

But the access conditions are not the same for the potential mobile network operators. Frequency spectrum is not inexhaustible resource and its scarcity results in a limitation in the number of mobile network operators which obtain license. This indicates that potential MVNO has more chances to enter mobile network than traditional operator.

Conclusions

The conducted analysis shows that traditional operator's strategic group is less sensitive to the threat of new entrants, as it is more complicated for potential market player to get a licensee position. Other aspects which protect MNO strategic group and creates greater profit potential include mobility barriers (factors which deter the ability of other companies to imitate the strategy). The main factors include telecom brand recognition, high capital requirements, economies of scale and weak possibility for new entrants to get a license. Almost all European countries have already distributed 3G licenses, so the only way for the newcomers to enter 3G network is by entering into MVNO commercial agreement.

Even though all the factors indicate that it is easier for the new entrant to join MVNO strategic group, there are some aspects which make it more complicated to compare profit potentials for MNOs and MVNOs. Virtual operators are completely dependent on the host operator's willingness to enter into commercial agreement and the terms of this agreement. New regulatory framework is likely to improve situation in favour of MVNOs, but they are still very reliant on incumbent operators. It may take a long time for potential entrant to find a host operator, which will agree to enter into commercial agreement on the terms which suit both players. Regulatory involvement may result in even longer procedure.

Regarding the profit potential, it might be concluded that it is fairly high for both MNOs and MVNOs.

¹⁴³ Bear Stearns, *Wireless Telephony* (April 2002), p.16

7.1.2. Threat of Substitutes

The fixed network may be regarded as a substitute for the mobile operators, but the latest market researches has shown that fixed subscribers are already overtaken by mobile subscribers¹⁴⁴; so fixed-line operators can't be considered a considerable threat. In practice, there is no product or service which offers the same functionality as the GSM or UMTS. Paging services can't be regarded as a real substitute as well, since it can be used as an alternative for short messages (SMS) only.

Wireless Local Area Network (WLAN) technology might be seen as a possible substitute or complement to mobile technologies. WLAN is more like a fixed wireless access (or wireless local loop) technology without the need for a directional antenna. It is much cheaper for equivalent speed than mobile and fixed wireless access (FWA). But it has limited coverage (cell radius typically 50 m) and lack of hand-off and small cell size means very limited mobility.

The main threat from the possible substitutes is imposed to traditional operators, as MVNOs do not make any investments in the technology.

Conclusions

MVNOs almost have no threats of substitutes, which make their profit potential high. Traditional operators face some dangers and their profit potential is moderate.

7.1.3. Bargaining Power of Buyers

Size and concentration of buyers

It is quite important here to emphasize the role of corporate segment, which brings the highest revenue and highest ARPU for the mobile operator. The amount of employees of the biggest corporations may estimate a several thousands of people and the costs of losing such a client can be really high. Another aspect is that these corporate segment customers are less likely to change their mobile operator and it might be very difficult for the new entrant to get this market segment. This issue is not of a big importance for most of MVNOs, since their main target is pre-paid customers with quite low ARPU. However, the situation might be different if potential MVNO has its own customer base from their core business.

But the biggest part of MNOs' and MVNOs' customers is fragmented and have no particular influence on the price or service.

Product differentiation

The main services provided both by traditional operators and MVNOs are differentiated owing to the value added services, which may differ from one operator to another. Taking into account the fact that traditional operators have been mostly concentrated on the providing basic services (like voice and SMS), it might be concluded that they are not that experienced in providing additional services, especially in the 3G environment. MVNOs are taking the main advantage of content providers by concentrating mostly on the value added services, quite often offering a wider variety of opportunities for the

¹⁴⁴ ITU report (2003) "Mobile overtakes fixed"

customers than traditional operators. However, product differentiation mostly depends on the competitive strategy, chosen by particular company.

Buyers' switching costs

The situation on the mobile market has changed drastically during the last five years. Number portability policy has been implemented in almost all European countries; that gives an opportunity for the subscriber to keep its mobile number when changing operators. Today, it doesn't cost a lot for the customer to change its mobile operator. Companies don't have legal rights to charge subscribers for closing the contract and it's even easier with pre-paid tariffs. The only fee the customer has to pay is the cost of opening a new contract, which usually is not very high.

But while switching costs are relatively low for residential telecom customers, they can get higher for larger business customers, especially those that rely more on customized products and services. Also, some operators try to lock-in a proportion of consumers by giving out cost benefits as part of a long-term contract and in so doing generate short-term switching costs to customers. In general the switching costs for buyer' are moderate both in the case of MVNOs and traditional operators.

Buyers' information

There is not a big difficulty for the buyer to get any kind of information about mobile operators' tariffs. But the knowing of prices is of little value if the quality of the services is unknown¹⁴⁵. Sometimes customers might be quite conservative if they are satisfied with a quality of the services they get from their mobile operator, and don't trust the new entrants. The situation is almost the same for MVNOs and traditional operators, as the end-users usually don't make any distinction between those two.

Buyers' ability to backward integration

There is almost no threat of backward integration. Theoretically, there might be a possibility that a potential MVNO (with non-telecom background) is a customer of the traditional operator. But this kind of situation will probably lead to "win-win" commercial agreement, where the main decision is made by MNO.

Conclusions

Conducted analysis indicates that the bargaining power of buyers is average, both for MNOs and MVNOs. This means that profit potential is moderate.

7.1.4. Bargaining power of Suppliers

The following analysis of suppliers bargaining power takes into account that traditional operators are on of the main suppliers for MVNOs. MVNOs don't depend on hardware suppliers at all, as utilize host operator's network; but they are completely dependent on their host MNO.

¹⁴⁵ Robert M. Grant "Contemporary strategy analysis—concepts, techniques, applications" 4th edition, 2002 p.81

Size and concentration of suppliers

The main suppliers of traditional mobile operators' can be divided into the following main groups: hardware suppliers, handset suppliers, software suppliers and content suppliers. The fact that GSM and UMTS are opened standards and competition between hardware suppliers result in a fairly weak bargaining power. Mobile operators are not dependent on particular hardware manufacturer and usually combine different brands, while constructing network. Handset suppliers market is still dominated by a few strong brands, but the amount of mobile phones manufacturers grows very fast, offering cheaper models with a variety of opportunities and creating intensive competition on the handsets' market. The bargaining power of software and content suppliers is quite low, as there are lot's of big and small companies offering these products and services.

The situation with MVNOs is a bit different. They don't need hardware and mostly even handset supplier, as they usually buy bulk time from MNO and don't sell handsets. However, the impact of software and content providers is almost the same as on traditional operators. MNO is the main supplier for the virtual operator. Most of the European mobile markets are still dominated by strong and huge traditional operators which amount is limited by the number of GSM or UMTS licenses per country.

Importance of the customer' industry for the suppliers

The mobile telecom industry is of the greatest importance for the hardware manufacturers because their products and services are sold mostly or solely in this industry. Traditional mobile operators are the main customers of telecom equipment suppliers. The same may be true for small software and content suppliers, which main business is orientated on providing big mobile players with additional services. Handset manufacturers are not that dependent on mobile operators. They usually use operator's network as one of the distribution channels for their devices. However, the most famous European handset manufacturers (Ericsson, Siemens, Alcatel and Nokia) are the main hardware suppliers at the same moment, therefore strong partnership with mobile operators is essential part of their businesses.

MNOs main reason for entering into commercial agreement with MVNO is desire to sell extra capacity and share costs of network construction. However, the amount of potential MVNOs is higher, than traditional operators and very often MVNO is the more interested side; therefore MNOs bargaining power is fairly high for MVNOs.

Importance of the suppliers' product for the buyers' business

The role of hardware suppliers is crucial for traditional operators, as the mobile infrastructure is the keystone for such operators. The content and software suppliers are equally important both for MNOs and MVNOs, but quite often the supply side is greater than demand.

MNO capacity is of a greatest importance for MVNO; this fact adds more power for MNO as a supplier.

Suppliers' switching costs and product differentiation

The costs of switching hardware suppliers are fairly low for operators. The broadband switching equipment and technical platforms manufactured for the same standard (GSM

or UMTS) are compatible with the same equipment manufactured by other suppliers, which makes operator free to choose particular supplier. The same situation occurs with billing software. However, most of the mobile operators are not likely to change their billing software providers and prefer to sign long-term contracts. The change of billing provider will lead to the necessity of additional employees' education and outsourcing costs, apart from the fact that new billing or ERP system may cost several billion of euros.

MVNOs are more flexible in this aspect mostly because of their small size, and suppliers' switching costs remain moderate for this market player as well. Another aspect deals with MVNOs' ability to change their host operators. In practice everything depends on the contract duration. MVNOs or MNOs are not likely to break the contract on their own initiative, as it may cost a lot and it may harm their reputation (signifying for potential host operators or MVNO that the company is not a reliable partner).

Conclusions

The main factors indicate that suppliers bargaining power has a fairly weak impact on MNOs, while the importance of host operators for MVNO makes it stronger for the latter. It indicates that profit potential is fairly high for traditional operators and moderate, or fairly low for MVNOs.

7.1.5. Rivalry between Established Competitors

Concentration of Competitors

Traditionally, the mobile telecom market was dominated by a few large companies and competition was almost impossible. After the market liberalization a great amount of players appeared on the telecom industry scene and its amount is growing. Both MNOs and MVNO has a great number of competitors.

Diversity of Competitors and Strategic Stakes

Diversity of MVNO competitors is mainly expressed in their strategies and relationships with their core-businesses. Diversity of traditional operators is much lower, as they are specialized in mobile telecom services only. Most of MVNOs target a specific customer segment which is related to the company's main activity. Non-telecom MVNOs are using mobile telecommunications industry for leveraging their brand; fixed operators usually offer mobile services as complementary to fixed telephony. MVNOs which obtain licenses in other markets are closer to the strategy of their host operators, but usually they attempt to find specific areas in their business, which differ from ones providing by their host company. Traditional operators have substantially higher stakes than MVNOs as they have higher capital investments and concentrated on the mobile services.

Industry growth

Mobile telecommunication industry is growing very fast. The average mobile penetration in Europe has reached 80% and that is not a limit. 3G brings new opportunities and revenues both for traditional and virtual mobile network operators.

Fixed Costs and Excess Capacity

The fixed costs are considerably high for traditional operators. The costs of infrastructure and licenses force them to try finding the ways to share excess capacity. MVNOs are renting this excess capacity from their host operators and therefore have very low fixed costs. But variable costs are substantially higher for the MVNO.

Exit Barriers

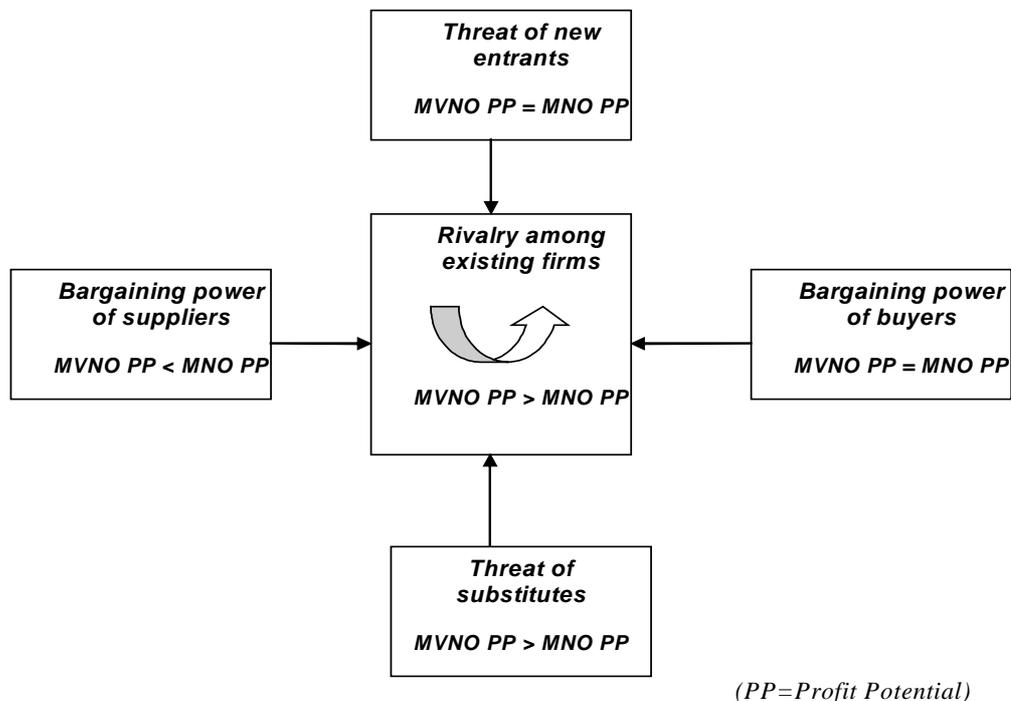
The exit barriers are very high for the licensed operators owing to the high capital investments. MVNO has no specific obstacles for changing its host operator, and are generally dependent on the terms of their contract with host operator.

Conclusions

The majority of factors indicate that MVNOs have lower rival intensity, mostly owing to lower fixed costs and weaker exit barriers. Both types of operators have to take part in price wars; however it's easier for MVNOs to reduce prices, since they have less expenditure than MNOs. All the other factors have the same influence on both strategic groups. This indicates that profit potential is moderate for MNO and is a bit higher for MVNO.

Conducted analysis indicates that mobile telecommunication industry is fairly attractive both for MNOs and MVNOs. Although MNOs are less sensitive to the threat of new entrants and suppliers bargaining power, they face some dangers from substitute products and have higher rivalry intensity. Both strategic groups have moderate profit potential, however it's a bit higher for MVNO.

Figure 7.1 MNOs and MVNOs Profit Potential



7.2. PEST analysis

Analysis of five forces within mobile telecommunications industry has provided the understanding of industry's attractiveness and profitability, and has explained the interaction between the main market players. The aim of PEST analysis is to examine macro-environmental factors which affect the whole mobile telecom industry in Europe. PEST analysis together with Porter's five forces analysis will allow assessing the main threat and opportunities in the market for MVNOs and the main ways how they might eliminate threats and exploit the opportunities.

Political/Legal factors

Political and legal issues have a great impact on mobile telecom industry. Undoubtedly, liberalization of the industry and the latest EU regulatory framework on telecommunications influence European telecom market and companies' behaviour and strategies. New regulatory package is crucial to harmonizing European markets and most of political decision makers consider that this new framework is a "major boost" to EU economy.

As it was discussed in Chapter 6, under the new regulatory framework National Regulatory Authorities are able to monitor and control the relationships between incumbent operators and MVNOs; define operators with SMP, influence their price policy and require them to share infrastructure.

Licensing is another tool of controlling and managing market players. British experience of 3G license auction showed that the entry-prices for potential entrants might be incredibly high and could be one of the ways for the government to maximize the revenues of the state.

Economic factors

Economic factors have a vast impact on telecommunications industry. The main economic indicators which influence economic activities and consumers' behaviour include the growth rate of the economy, business cycles, exchange rates, inflation, international capital flows, unemployment rates and budgetary policies.

During the years 2000 – 2003, EU is set to record economic growth considerably below potential for the third year in a row. Slow economic activity can be associated with global economic uncertainty persisted throughout the spring of 2003. The Iraq conflict dominated headlines, stock markets nose-dived and the euro **exchange rate** continued to appreciate rapidly, especially against the US dollar¹⁴⁶. But after bottoming out in the first half of 2003, the economies of the EU turned around in the second half of the 2003. The average **growth rate** for the year as a whole is estimated to have been 0.8% in the EU. In view of the buoyancy of global growth and trade, and the returning confidence of domestic producers and consumers, the recovery is set to gather momentum this year. A

¹⁴⁶ The EU Economy 2003 Review EUROPEAN ECONOMY. No 6. 2003. Office for Official Publications of the EC. Luxembourg. KC-AR-03-006-EN-C

rebound to average growth rates of 2% for the EU is projected for 2004, and around 2.4% in 2005¹⁴⁷.

Despite the external incentive from global demand, the main factors for the recovery embrace macroeconomic policy conditions, continued disinflation, supportive financial conditions, and progress in structural reforms. The recovery is strengthened by a rise in investment expenditure, supported by a more gradual pick-up in **private consumption**. The results of recent survey made by the European Commission¹⁴⁸ supports the view that more households intend to undertake major purchases. Up to now, the improvement in consumer confidence was mainly based on a better outlook for the economy and for the labour market. This should lead to greater optimism on the part of households regarding their own financial situation, which should in turn provide an impulse to consumer spending. The projected recovery in business and household spending stems in part from **employment** growth (0.3% in 2004 and 0.9% in 2005) and the particularly low real interest rates, both short-term and long-term¹⁴⁹.

The strong increase of international **capital flows** (portfolio flows and direct investments) over the past ten years is the combined result of legal and economic forces. As regards the EU, the full liberalisation of capital movements within the Community was finally accomplished on 1 July 1990 while capital movements between Member States and third countries were fully liberalised on 1 January 1994. The rapid expansion of domestic financial markets and surging international trade has been two of the main driving economic forces. **New Member States** will support the trend towards increasing of portfolio flows and direct investments within the EU. The economies of the new Member States are estimated to have expanded on average at a robust 3.6% in 2003, as accession unleashes favourable growth dynamics. Apart from positive impact of enlargement on EU economy, there are some negative sides as well. The unemployment rate in new Member States is slow to decrease, inflation set to increase and high government deficits are expected. These factors have unfavourable impact on the economic growth within the EU, but generally are expected to decline in a fairly short-term. Compared to an estimated 2.1% in 2003, headline inflation is expected to fall to 1.8% this year, as a result of the lagged effects of the euro appreciation and weak domestic price pressures¹⁵⁰.

The general **government deficit** in the EU is expected to remain stable at 2.6% of GDP in 2004, before declining marginally in 2005. With respect to 2003, the general government balance is expected to deteriorate this year in all EU countries, except Germany, Spain, France, Austria and the UK. In the case of Denmark, Sweden and Finland, this deterioration refers to a fall in the surplus¹⁵¹. Mention should be made of the fact that allocation of UMTS licences impacts strongly on the general government accounts for some countries in 2000, 2001 and 2002.

¹⁴⁷ Economic Forecasts, Spring 2004 EUROPEAN ECONOMY. No. 2. 2004. Office for Official Publications of the EC. Luxembourg.

¹⁴⁸ The European Commission, BUSINESS AND CONSUMER SURVEY RESULTS (January 2004) http://europa.eu.int/comm/economy_finance/indicators/business_consumer_surveys/2004/bcs0104_en.pdf

¹⁴⁹ Economic Forecasts, Spring 2004

¹⁵⁰ The EU Economy 2003 Review

¹⁵¹ Economic Forecasts, Spring 2004

Social factors

Nowadays, the mobile phone might be considered the key “social object” present in every aspect of daily life. Mobility and “always-on” connectivity defines not only the future technological landscape, but equally the social one. One of the biggest market drivers for mobile phones is “convenience”, but there are some other factors including security, fashion, social contacts and work requirements¹⁵².

What reasons do people cite for valuing their mobile phones?

- 89% To give peace of mind for loved ones’ safety
- 83% To increase own personal safety
- 68% To organise social life
- 39% To be more productive at work

Source: MORI survey

One of the principal reasons cited for owning a mobile phone is safety and security. Carrying a mobile device means that users can easily contact roadside assistance providers, e.g. insurance companies and the police. Many parents are now giving their children mobile phones in order to ensure their safety, and health care institutions have begun exploiting the potential of wireless. On the other hand, a number of scientific reviews have been conducted analysing the potential adverse health effects of mobile technologies. Today, the question of whether mobile phone usage can actually lead to negative medical side effects is one that remains unanswered. According to the World Health Organization (WHO) “present scientific information does not indicate the need for any special precautions for use of mobile phone.”¹⁵³

Social aspects changes with time and are highly differentiated by age, gender and culture. Even though business segment remains the most profitable for the mobile operators, the role of youth market shouldn’t be underestimated. Young people comprised a multi-billion dollar market for mobile phones and services by the end of 2003, according to a recent report by the Wireless World Forum (W2F)¹⁵⁴. In most of the European countries the mobile has become the principal mode of socializing for teenagers. Young people use the mobile primarily to sustain and enhance their social networks. An important recent trend recently observed among young people is a distinct preference for SMS over voice calls. According to a survey by CPP (a mobile insurance company), more than eight out of ten people under the age of 25 in the UK are more likely to send someone a text message than to call¹⁵⁵.

The youth segment is active in transforming the application and use of digital technologies in unprecedented ways. This segment (the range of teenagers and young

¹⁵² ITU Background Paper " [Social and Human Considerations for a More Mobile World](http://www.itu.int/osg/spu/ni/futuremobile/SocialconsiderationsBP.pdf)" (24 February 2004) <http://www.itu.int/osg/spu/ni/futuremobile/SocialconsiderationsBP.pdf>

¹⁵³ World Health Organization “Electromagnetic Fields and Public Health: Mobile Phones and Their Base Stations”, Fact Sheet #193, <http://www.who.int/inf-fs/en/fact193.html> (23.04.04)

¹⁵⁴ Oliva, Erwin Lemuel G. “Youth a Multibillion Market for Mobile Phones”. Asia Africa Intelligence Wire. March 24, 2003.

¹⁵⁵ ITU Background Paper " [Social and Human Considerations for a More Mobile World](http://www.itu.int/osg/spu/ni/futuremobile/SocialconsiderationsBP.pdf)"

adults between the ages of 12 – 25) is more comfortable with using the internet, building web sites, communicating via mobile phones and playing with digital gadgetry than any generation prior. These aspects are becoming essential with the advent of 3G technologies, as the youth market is the most interested in new opportunities offered by UMTS networks.

Figure 7.2 Interest in 3G Applications

	W. Europe	E. Europe
Total	22%	26%
Under 25	37%	30%
25 to 34	27%	26%
35 to 49	19%	25%
50+	9%	24%

Source: Cellular Online

Technological factors

The advent of a technological revolution results in great changes of global industries. Undoubtedly, mobile telecommunication industry is very sensitive to all technological changes. In order to compete on the saturated mobile market, market players have to be always “up-to-date”, offering new products and services. In that way, technology may provide a competitive advantage.

Within the EU the importance of technological development is highly appreciated. The Mobile Communications & Technology Platform is a concrete example of the 'technology platform' concept envisaged under the Commission’s “European Growth Initiative”¹⁵⁶, which aims to rally political commitment and resources behind key priority investment projects of European interest. Working with the European Investment Bank, the Growth Initiative identified a "Broadband Quick-start projects", which include the Mobile Communication and Technologies Project. It will focus on supporting research related to the introduction of 3G mobile communications systems and will also look beyond those technologies (with some EU level support through the Community research or structural funding). This project has started in the beginning of 2004 and will be finished in 2006, with total cost € 800 million for R&D. In general Community funding for R&D on Information and Communications technologies (ICTs) represents about 5% of total R&D spending on ICTs in the EU. The remaining funds are private (companies investing in R&D) or public (support from national R&D programmes).

The support of the EU initiatives is essential for the telecom industry market players, as the cost of new technologies implementation might be too high, which results in need for external financial sources. 3G environment give rise for the development of new services and complicated mobile devices. The mobile handset has evolved from the simple device providing voice and text to modern tool with a great variety of opportunities. “Always on-line” mobile internet, GPS, MMS, video chat and the greatest range of possibilities

¹⁵⁶ “European Growth Initiative. Final Report” COM(2003) 690

provided by smart-phones is already a reality. The market of handset producers meets the demand for more complicated devices which can operate in the 3 G environment, and might be serious threat for PC and digital cameras' manufacturers.

Conclusions on PEST analysis

Environment scanning has proved the fact that mobile telecommunications industry is influenced a lot by macro-economical factors. Legal and political issues have a great impact on the behaviour of incumbent operators and MVNOs, creating barriers to entry or controlling current market trends and helping small companies to compete with big market players (mobile operators with significant market power). New EU telecom regulatory framework supports MVNOs in their attempts to enter into commercial agreements with incumbent operators, hence creating higher competition within the industry.

Economical growth and increase in buyers' purchasing power creates higher demand for telecom services and therefore lead to the increase of mobile penetration. Even though European mobile market is fairly saturated (80% in Europe), the year 2004 is expected to be the main starting point for 3G network subscribers, which will in turn increase the revenues of mobile operators.

Social aspects are indispensable for understanding customers' needs and behaviour and in defining the target segment of customers. Nowadays, there is a great evidence of youth market active participation in supplying mobile telecom services. Their role will increase with the expanding of 3G networks. It is notable, that end-users are mostly interested in the prices and quality of the services and usually don't define MVNOs and MNOs.

Telecom industry is directly linked to the technological progress. Current technological developments and the EU support of mobile industry make telecom market attractive both for the new players and investors. The prices of the 3G licences and facilities construction costs has created insurmountable barriers for potential licence-holders, but from the other hand stimulated licensees to share infrastructure with MVNOs.

Opportunities and threats for MVNOs

Conducted analysis shows that MVNOs have a great variety of opportunities in the mobile telecom market, which gives a high potential for additional revenues. Most of the external factors indicate a favourable environment for existing MVNOs and new entrants, and UMTS technologies are expected to make the industry even more profitable. The main opportunities which MVNOs are able to realize in such environment include:

- Faster and lower risk approach to entering and penetrating a market
- Differentiate and expand own services
- Covering a niche which MNOs do not serve (i.e. youth market)
- Developing a sustained customer relationship
- Distribution of own content

- Cross selling to existing customer base
- Leveraging own distribution network
- Leveraging existing strong brand¹⁵⁷

But inevitably there are threats as well. Saturated and hypercompetitive mobile market impose some dangers on weak MVNOs. The growing amount of new MVNOs and service providers increase competition and therefore lead to price wars. The fact that mobile telecom services are fairly standardized, allow customers to look for the cheapest services, often sacrificing the ability to use additional multimedia content. Therefore it is crucial for any MVNO to understand social and economic factors, which influence their target market and protect itself with a flexible price policy and differentiated services. Another aspect concerns MVNO's influence on the core business. Poor MVNO might be destructive to the whole brand and for all the businesses provided under this brand. It is critical not to underestimate the impact that MVNO implementation could have on management and operations and to consider to what extent the MVNO should be integrated into the heart of the core business. More specific risks are based on the fact that MVNOs have to pay higher costs for network access than MNO. Thus, MVNOs need to be able to either generate more revenue or cut costs in a way that MNO cannot replicate. They are also not able to control network quality level and introduce additional competition into the market, driving margins down¹⁵⁸.

¹⁵⁷ EURESCOM Summit 2001 "3G Technologies and Applications", *Arthur D. Little Int., Inc.*
http://www.eurescom.de/~pub/seminars/Summit2001/PartIV_MVNOs_final.PDF (15.03.04)

¹⁵⁸ Ibid

7.3. Generic strategies analysis

Porter's five forces and PEST analysis examined the impact of external forces within the industry and environmental factors which influence the whole mobile telecom industry. However external analysis is not enough for explaining the success of the MVNO business model. Choosing the suitable competitive strategy is crucial both for new and existing MVNOs. This chapter provides analysis of MVNOs' generic competitive strategies using examples of the most successful MVNOs in Europe: Tele 2 Denmark and Virgin Mobile UK. It is notable, that those two models represent different types of MVNO described in Chapter 5. Virgin Mobile is an example of non-telecom company, which has chosen Enhanced Service Provider MVNO model, while Tele 2 Denmark encompasses the role of licensee in Sweden and fixed-line operator in Denmark, and has chosen "pure" MVNO model.

7.3.1. Virgin Mobile UK

When Virgin Mobile was launched in November 1999 as a 50:50 joint venture between Sir Richard Branson's Virgin Group and Deutsche Telekom's One2One (now T-Mobile), it broke new ground by becoming UK's first mobile virtual network operator¹⁵⁹. The company has positioned itself as the fifth biggest mobile operator in the UK using the recognized brand, advertising and straightforward tariff that appealed to consumers. Virgin Mobile has successfully employed **focus strategy**, targeting teenagers and young adults who prefer to "pay as they go", identifying their market segment in terms "young at heart".

Virgin Mobile strategy combines differentiation and low-costs approaches, offering their target group a wide range of product (Virgin Xtras allows subscribers to pre-program any content and services they wish to receive on their phone through the Virgin Mobile Internet site) and low prices for the trendiest services within the youth segment. Nowadays, SMS is one of the most popular services among teenagers and young adults. In June 2003 Virgin Mobile launched a new tariff of just 3 pence per SMS message, when sent from one Virgin Mobile customer to another Virgin Mobile customer within the UK. Other UK mobile operators offer less favourable pricing, typically charge 10 pence per message¹⁶⁰. This aggressive price cut is still supported by the strong advertising, which appeals to young people who can't imagine their lives without SMS. Virgin Mobile's exclusive deal with T-Mobile in some way has limited its ability to cut prices. In January 2004 Virgin Mobile renegotiated the deal and today it has the option of using other carriers, freeing it to offer new types of services and tariffs to British consumers¹⁶¹.

Another method the company uses for attracting the youth segment is stressing the fact that Virgin Mobile offers no contracts, for both "Pay As You Go" and "Pay Monthly" schemes (the company presents one tariff plan and two payment schemes, which is fairly

¹⁵⁹ "Winner: Virgin Mobile", *Management Today*, September 2002 pp. 4-5

¹⁶⁰ See Appendix III

¹⁶¹ Schenker J.L, Airlines joining mobile phone race, *International Herald Tribune*, 23 February, 2004

revolutionary approach for the mobile market). Mobile market research showed that people considering switching to Virgin Mobile saw Virgin as a brand with a more individual, popular and fun image than its competitors. Most notably, having "no contract to tie you down" was the primary reason for joining the network¹⁶². The company has successfully employed this advantage and has supported it with scandal advertising campaign involving rap-star Wyclef Jean and slogan "*Earn free minutes without signing a contract*". This campaign was fourth in the top-ten advertisements of 2002 in the youth press, and Virgin Mobile's average monthly sales rose by 29% after its introduction¹⁶³. Further Virgin Mobile commercials have been quite provocative; some of them have been even censured by the Advertising Standards Authority, which, in turn, has increased young audience interest in Virgin brand.

According to Andy Mallinson, head of product marketing for Virgin Mobile, the company's "pay as you want" offer and simple tariff "have proven to be a hit across the marketplace, and particularly with young customers, who want to enjoy the flexibility of Virgin's version of a "pre-pay facility", and the ability to control their spending more easily than they can with a contract."¹⁶⁴

Today, apart from the UK, Virgin Mobile operates as MVNO in Australia and the USA, effectively employing its youth segment focus strategy. However the company didn't manage to succeed in Singapore and had to close venture because of the weak demand in July 2002¹⁶⁵. The company cited the island state's high mobile-phone penetration rate and weak economy as grounds for the venture's failure. Analysts blamed this failure on too high SMS pricing in comparison with local operators; poor positioning; lacking of distribution and the fact that frugal Singaporeans didn't see the value in the Virgin brand.¹⁶⁶ Singapore experience has proved that in order to make "pay ahead" services actually pay; it will never be too much information about or feedback from customers. The company has learned a tough marketing lesson and regularly conducts customer satisfaction surveys that examine such factors as why people chose Virgin Mobile, their eagerness to recommend the network, their usage of new services and their attitudes towards them. There are also special surveys designed to assess, subscribers' experiences of buying over the internet and regular online 'brain surgeries', in which Virgin advocates are asked to be critical of the company¹⁶⁷. On the 24th of April, 2004, Virgin Mobile announced that it has four million customers, confirming its position as the largest MVNO in the UK¹⁶⁸.

Even though the company doesn't achieve low cost and differentiation from the perspective of the market as a whole, it does achieve both of these positions within the youth market. Most of the market conditions and the Virgin Mobile capabilities indicate

¹⁶² Effectiveness Awards 03: Technology & Telecoms Winner, *Marketing Week* 2003 p. P.S.71

¹⁶³ Ibid

¹⁶⁴ "Virgin Mobile Unveils The Future Of Person-To-Person Gaming", Press Release, Feb 20 2002 <http://www.sendoholdings.com/news/newsitem.asp?ID=44>

¹⁶⁵ Burton, J. "Virgin, SingTel close venture on weak demand", *Financial Times*, July 9 2002

¹⁶⁶ Misconnections, *Business Asia*, 2002, Vol.34, Iss. 18; p. 6

¹⁶⁷ "Winner: Virgin Mobile", *Management Today*, September 2002 pp. 4-5

¹⁶⁸ Virgin Mobile Media Centre, http://www.virginmobile.com/mobile/media_centre/media_intro.jsp

that focus strategy is the perfect choice for the company. The youth segment is getting more profitable and lots of the young people are actively using content and value added services, which are supposed to bring even more revenue in 3G environment. Most of the leading British operators are not yet so interested in young people niche, and are either concentrated on business segment or offer pre-paid plans which are less attractive for young people in terms of the costs for the most popular services among teenagers (like SMS, or mobile gaming). Also it might be quite difficult for multisegment operators to put capabilities in place to meet specialized requirements of the youth segment and satisfy the needs of their mainstream customers simultaneously. Another favourable aspect is the Virgin Group's presence in various businesses, which makes the brand stronger and gives an opportunity to integrate new services, which appeals to young people. This includes Virgin Megastores, Virgin Holidays, Virgin Cosmetics, V2 Music, etc.

7.3.2. Tele 2 Denmark

Tele2 AB, formed in 1993, is the leading alternative pan-European telecommunications company which offer mobile and fixed telephony, data network and Internet services, under the brands *Tele2*, *Tango* and *Comviq* to more than 20 million customers in 23 countries. In 2000 Tele 2 launched the first MVNO in Denmark which became the most successful "pure" MVNO business model in Europe. Tele 2 Denmark follows **low-cost competitive strategy** which has been developed over a period of more than 10 years by the whole Tele 2 Group and tested for both fixed line and mobile operations in a large number of European countries¹⁶⁹. Unlike traditional Danish operators, which are burdened by costs associated with license fees, infrastructure costs and databases, Tele 2 Denmark buy capacity from *Sonofon*, avoiding the need to build their own networks, buy licenses or hire large staffs. This allows the company to deliver mobile services like voice calls and short messaging at lower rates and without any type of mobile subscription. Successful Tele 2 Denmark model set an example for a numerous amounts of small MVNOs which have already grabbed 20 percent of the Danish mobile market and led prices for voice calls offered by traditional operators to drop 54 percent in just nine months.¹⁷⁰

The main factors which allow Tele 2 Denmark to position itself different both from small MVNOs and leading traditional operators include experience of operating in Danish market as a fixed-line operator, existing customers' data base and recognised brand combined with cheap and simple services. Tele2's success in adopting its low cost profile follows largely from its pursuit of an identical strategy across national boundaries. Before entering the country as MVNO, Tele2 usually starts by establishing itself in the fixed telephony market. The priority is given to quickly building a satisfactory customer base and then cross-selling. The company's mission to deliver "*cheap and simple telecom services*" is highly supported by its MVNO business model, which protects Tele2 from unnecessary market risks and paves the way for future profitability¹⁷¹. Tele2 stresses its

¹⁶⁹ Tele2 (2003) "GSM 1800 license application. Switzerland", Project summary

¹⁷⁰ Schenker J.L, Airlines joining mobile phone race, *International Herald Tribune*, 23 February, 2004

¹⁷¹ Lars-Johan Jarnheimer (Tele 2 president and CEO), February 2004, www.tele2.com

aim “to give customers the lowest prices on the market” through strong advertising campaigns, appealing to pre-paid customers.

Today, Tele 2 operates as MVNO also in Finland, Switzerland, the Netherlands, Austria and Norway. It is notable, that in 2002 Tele2 returned its UMTS license to the Norwegian Government and preferred to enter into commercial MVNO agreement with *Telenor*, avoiding the need to build out 3G infrastructure in Norway¹⁷². The company’s approach to avoid investing heavily in networks construction, preferring MVNO as a business model for mobile telephony, gives the company more opportunities for costs reduction and speed and freedom of action which allow growing more quickly than their competitors¹⁷³.

In order to remain successful low-cost provider, Tele2 is using the lower-cost edge to underprice competitors and attract price-sensitive buyers in great enough numbers to increase total profits. It corresponds most of the commonly required skills and resources for overall cost leadership. Tight cost control is expressed in the company’s attitude towards unnecessary high investments and human resources management (employing minimum required amount of personnel). Instead of offering complicated and differentiated services, the company concentrates on cheap and simple product which appeals to average customer. This strategy is particularly powerful in the Danish mobile telecom market, as the majority of rivals compete mainly on price, and low cost relative to competitors is the only competitive advantage that matters¹⁷⁴. Another important aspects which give buyers the flexibility to shift purchases to lower-priced seller, are relatively low switching costs and number portability. These facts are making low-cost strategy even more valuable for the company.

Conclusions

Conducted analysis provides the examples of possible successful competitive strategies which might be employed by MVNOs. Although different types of MVNOs rely mostly on their unique profile, it’s crucial for them to be sensitive to mobile market demand and changes, choosing the right competitive strategy. The external environment analysis has shown that European market is saturated and hypercompetitive. Price competition among mobile operators is very dynamic and most of the mobile services are fairly standardized. These market circumstances make industry newcomers use introductory low prices to attract customers and there is likelihood that low costs have the biggest impact on customers’ decision in choosing their mobile operator. The Tele 2 experience shows that low-cost strategy combined with the company’s unique features might lead to success within the telecom market.

¹⁷² 3G Licence Holder Becomes 3G MVNO, November 2002, <http://www.3g.co.uk/PR/November2002/4389.htm>

¹⁷³ Wieland, K., The price is right, *Telecommunications International*; Apr 2003; 37, 4; p. 14

¹⁷⁴ Thompson A.A., Jr., Strickland A.J. (2001) “Crafting and Executing Strategy”, Twelfth Edition, McGraw-Hill Irwin

Another option for MVNOs is focus strategy. The mobile industry has different niches and segments, which allow choosing a competitively attractive niche suited to the company's resource strengths and capabilities. However, this strategy requires strong understanding of the targeted segment needs and is more suitable for the companies with non-telecom or fixed-line businesses' experience within the same market segment. This approach may help to leverage existing brand if the target market niche is big enough to be profitable and offers good growth potential. The youth segment, targeted by Virgin Mobile, is an excellent example of profitable market niche which has a potential to grow. Nevertheless, the company should be very careful in choosing the strategy for entering new geographical markets. Virgin's Singapore experience showed that over evaluating of brand value, weak analysis of the concrete target market and overpricing can lead to weak demand and hence, to failure.

The following figure illustrates strategic positions of Tele2 and Virgin Mobile.

Figure 7.3 Generic strategies

		STRATEGIC ADVANTAGE	
		Uniqueness Perceived by the Customer	Low Cost Position
STRATEGIC TARGET	Industrywide	DIFFERENTIATION	OVERALL COST LEADERSHIP 
	Particular Segment only	FOCUS 	

8. CONCLUSIONS

The main goal of external analysis has been to examine the attractiveness of mobile telecom industry for MVNOs and define their main opportunities and threats. Porter's five forces framework and PEST analysis indicate that the mobile telecom industry is attractive for MVNOs in terms of offering new revenue sources. Mobile telecom industry is one of the world's dynamic ones and 3G advent has brought more profitable opportunities for market players. MVNOs' profit potential is slightly higher than profit potential of traditional operator. The fact that virtual operators don't make heavy financial investments makes them less sensitive to the threat of substitute products and diminishes exit barriers. Buyers bargaining power is fairly weak as well. Even though the number portability and fairly low switching costs provide customers with freedom of choice, the main part of them is fragmented and has no influence on price or services. Fairly strong suppliers bargaining power is explained by the importance of host operator for MVNO and remains the most sensitive part of MVNO's business model. However, as the virtual operator enters the mobile market, it has lots of opportunities to outperform MNOs. MVNOs have low fixed costs, no excess capacity and therefore are more open for price reduction. They usually target narrow market segments, which MNO doesn't serve and particular MVNO has deep knowledge about; that makes rivalry intensity lower in comparison with traditional operators.

PEST analysis has proved that most of the external environment factors are in favour of MVNO business model. Political and legal factors indicate that there is very weak opportunity to enter mobile market as a traditional operator, mostly due to the fact that radio spectrum is a scarce resource and most of the licenses have been already distributed with the European market. From the other hand, new regulatory framework supports MVNO's position and enables national regulators to help potential players in their negotiations with incumbent operators. Legal framework analysis has explained the main regulatory issues MVNOs are able to rely on.

Expected economic growth results in increase of buyers' desire to consume telecom services, and social factors play an essential role in customer's behaviour. Consumption activity of youth market indicates growing demand for new services, which is especially important with 3G advent. Technological developments within the mobile telecom industry result in expanding traditional voice and text services into complicated multimedia content, which allow MVNOs to gain more profit. The main threats are mainly caused by the competitive environment within telecom industry and reluctance of host operators to enter into commercial agreement with MVNO.

Finally, generic strategies analysis has provided the examples of MVNOs' possible ways to succeed. Low-cost and focus strategies seem to be the best approaches for potential and existing MVNOs.

The results of this research don't contradict with existing studies on MVNO (conducted by analysts from *Arthur D Little*, *Pyramida Research*, *Telos Technology*, *Analysis Research*, *Ovum* and *Deutsche Bank*). Mobile telecom industry is a high growth revenue area which undoubtedly attracts new market players. MVNO business model provides the fastest and easiest way of entering telecom market without high investments in

deployment of network infrastructure or acquiring frequency spectrum. However, potential players should be careful in assessing their business opportunities and choosing an appropriate competitive strategy.

8.1. Suggestions for Further Studies

This thesis hasn't examined internal environment of particular MVNOs. Nevertheless, it encompasses one of the possible explanations of the particular company's success. The analysis might be based on resource based view, which include the analysis of the company's resources and capabilities, and hence allow examining the competitive advantages.

Another aspect, which is very relevant today, is the desire of non-telecom brands to enter mobile telecom market as MVNOs. MTV, Disney, General Motors, a great amount of grocery stores and airlines agencies are only a few examples of potential MVNOs. Recognized brand and established distribution channels are the main advantages of those business models. However the brand value may change dependently on geographic market or target group. How can non-telecom brand image influence customer's choice?

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<http://www.umts-forum.org/> - UMTS Forum
<http://www.virginmibile.com/> - Virgin Mobile
<http://www.tele2.com/> - Tele2

Mobile Terms & Acronyms

1G

The first generation of analogue mobile phone technologies including AMPS, TACS and NMT

2G

The second generation of digital mobile phone technologies including GSM, CDMA IS-95 and D-AMPS IS-136

2.5G

The enhancement of GSM which includes technologies such as GPRS

3G

The third generation of mobile phone technologies covered by the ITU IMT-2000 family

3GPP

The 3rd Generation Partnership Project, a grouping of international standards bodies, operators and vendors with the responsibility of standardising the WCDMA based members of the IMT-2000 family

AMPS

Advanced Mobile Phone System, the analogue mobile phone technology used in North and South America and in around 35 other countries. Operates in the 800MHz band using FDMA technology

ARPU

Average Revenue Per User

AUC

Authentication Centre; the element within a GSM network which generates the parameters for subscriber authentication

BSC

Base Station Controller; the network entity controlling a number of Base Transceiver Stations

BSS

Base Station System/Subsystem

BTS

Base Transceiver Station; the network entity which communicates with the mobile station

CDMA

Code Division Multiple Access; also known as spread spectrum, CDMA cellular systems utilise a single frequency band for all traffic, differentiating the individual transmissions by assigning them unique codes before transmission. There are a number of variants of CDMA (see W-CDMA, B-CDMA, TD-SCDMA et al)

CDMAone

The first commercial CDMA cellular system; deployed in North America and Korea; also known as IS-95

CDMA2000

A member of the IMT-2000 3G family; backwardly compatible with cdmaOne

D-AMPS

Digital AMPS, a US wireless standard also known as IS-136

EDGE

Enhanced Data rates for GSM Evolution; effectively the final stage in the evolution of the GSM standard, EDGE uses a new modulation schema to enable theoretical data speeds of up to 384kbit/s within the existing GSM spectrum.

ETSI

European Telecommunications Standards Institute: The European group responsible for defining telecommunications standards

GPRS

General Packet Radio Service; standardised as part of GSM Phase 2+, GPRS represents the first implementation of packet switching within GSM, which is a circuit switched technology.

GPS

Global Positioning System; a location system based on a constellation of US Department of Defence satellites. Depending on the number of satellites visible to the user can provide accuracies down to tens of metres. Now being incorporated as a key feature in an increasing number of handsets

GSM

Global System for Mobile communications, the second generation digital technology originally developed for Europe but which now has in excess of 71 per cent of the world market. Initially developed for operation in the 900MHz band and subsequently modified for the 850, 1800 and 1900MHz bands. GSM originally stood for Groupe Speciale Mobile, the CEPT committee which began the GSM standardisation process

GSM MoU

The GSM Memorandum of Understanding, an agreement signed between all the major European operators to work together to promote GSM. The precursor of the GSM Association

HLR

Home Location Register; the database within a GSM network which stores all the subscriber data. An important element in the roaming process

HSCSD

High Speed Circuit Switched Data; a special mode in GSM networks which provides higher data throughput By concatenating a number of timeslots, each delivering 14.4kbit/s, much higher data speeds can be achieved

IMT-2000

The family of third generation technologies approved by the ITU. There are five members of the family: IMT-DS, a direct sequence WCDMA FDD solution IMT-TC, a WCDMA TDD solution IMT-MC, a multicarrier solution developed from cdma2000 IMT-SC, a single carrier solution developed from IS-136/UWC-136 IMT-FT, a TDMA/TDD solution derived from DECT

IN

Intelligent Network

MNO

Mobile network operator

MVNO

Mobile virtual network operator.

MSC

Mobile Switching Centre; the switching centre of a mobile phone network, the MSC has interfaces to the BSCs, HLR, VLR and other MSCs

NMT

Nordic Mobile Telephone system; an analogue cellular technology deployed in the Nordic countries in the late 1970's; variations were also deployed in the Benelux countries and in Russia. NMT operated in the 450 and 900MHz bands and was the first technology to offer international roaming, albeit only in the Nordic countries

TACS

Total Access Communications System (an AMPS variant deployed in a number of countries principally the UK)

TDMA

Time Division Multiple Access; a technique for multiplexing multiple users onto a single channel on a single carrier by splitting the carrier into time slots and allocating these on an as-needed basis

UMTS

Universal Mobile Telecommunications System; the European entrant for 3G; now subsumed into the IMT-2000 family as the WCDMA technology

VLR

Visitor Location Register

WAP

Wireless Application Protocol; a de facto standard for enabling mobile phones to access the Internet and advanced services. Users can access websites and pages which have been converted by the use of WML into stripped-down versions of the original more suitable for the limited display capabilities of mobile phones

WCDMA

Wideband CDMA; the technology created from a fusion of proposals to act as the European entrant for the ITU IMT-2000 family

WLAN

Wireless Local Area Network; a short range radio network normally deployed in traffic hotspots such as airport lounges, hotels and restaurants. WLAN enables suitably equipped users to access the fixed network wirelessly, providing high speed access (up to 11Mbit/s download) to distant servers.

Comparative View on Services/Applications

Period	Major Technology Introduction	New Internal/External Applications
Up to 2000	2 G	Telephone Email SMS Digital Text Delivery
2001 - 2003	2.5 G	Mobile Banking Voicemail, Web Mobile Audio Player Digital Newspaper Publishing Digital Audio Delivery Mobile Radio, Karaoke Push Marketing/ Targeted programs Location-based services Mobile coupons
2003 and beyond	3 G	Mobile videoconferencing Video Phone/Mail Remote Medical Diagnosis and Education Mobile TV/Video Player Advanced Car Navigation/ City Guides Digital Catalogue Shopping Digital Audio/Video Delivery Collaborative B2B Applications

Source: International Telecommunication Union (ITU)

Appendix III

UMTS Deployment in Europe

Country	Operator	Date	Status
Austria	3	May 2003	Service Launched
Austria	mobilkom austria	April 2003	Service Launched
Austria	T-Mobile	December 2003	Service Launched
Belguim	Proximus	April 2004	Trial
Croatia	VIPnet	May 2003	Trial
Czech Republic	Eurotel	February 2003	Trial
Denmark	3	October 2003	Service Launched
Estonia	EMT	September 2003	Trial
Finland	TeliaSonera	December 2003	Trial
France	Orange	February 2004	Trial
Germany	O2	November 2003	Trial
Germany	Vodafone	February 2004	Service Launched
Germany	T-Mobile	January 2004	Trial
Greece	Telestet	January 2004	Service Launched
Ireland	3	October 2003	Trial
Ireland	Vodafone	May 2003	Trial
Ireland	O2	December 2003	Trial
Isle of Man	Manx Telecom	December 2001	Trial
Italy	3	March 2003	Service Launched
Italy	Italy	December 2003	Trial
Luxembourg	P&T Luxembourg	June 2003	Trial
Luxembourg	Tango	May 2003	Trial
Monaco	Monaco Telecom	June 2001	Trial
Netherlands	KPN Mobile	October 2003	Trial
Netherlands	Vodafone	February 2004	Service Launched
Portugal	Vodafone	February 2004	Service Launched
Slovenia	Mobitel	December 2003	Service Launched
Spain	Telefónica Móviles España	February 2004	Service Launched
Spain	Vodafone	December 2003	Trial
Sweden	3	May 2003	Service Launched
Sweden	Vodafone	February 2004	Service Launched
UAE	Etisalat	December 2003	Service Launched
UK	3	May 2003	Service Launched
UK	Vodafone	February 2004	Service Launched

UK	T-Mobile	February 2004	Trial
UK	Orange	February 2004	Trial

Source: UMTS Forum (April 2004)

Appendix VI

Virgin Mobile's text tariff offer

ENJOY GREAT TEXT							
With our text tariff, every message you send to other Virgin Mobile customers in the UK is at the same low rate of just 3p, whether you Pay Monthly or Pay As You Go. Plus, there are no rules and no limits, unlike other networks.							
	Virgin Mobile Pay Monthly or Pay As You Go	Vodafone Smartstep	O2 Bolt On	Orange Text saver	T-Mobile Pay As You Go	3toGo	Tesco Mobile
What you pay upfront	Nothing to pay	N/A	£9.99 a month for 200 texts	£19.99 a year for 5 texts a day	N/A	N/A	N/A
Texts to the same network	3p	First 3 texts a day 12p	First 200 texts a month 5p ¹	First 5 texts a day 1p ²	First 100 texts a month 7p ³	10p	5p per message to your 3 favourite numbers (Tesco Mobile only)
		All additional texts 9p	All additional texts 10p	All additional texts 12p	All additional texts 10p		
Texts to another network	10p	First 3 texts a day 12p	First 200 texts a month 5p	First 5 texts a day 1p	First 100 texts a month 7p ³	10p	10p
		All additional texts 9p	All additional texts 10p	All additional texts 12p	All additional texts 10p		
What's in the small print?	There is no small print	N/A	This is a fixed monthly charge, so if you don't use up all your monthly allowance, it works out as more expensive. Unused texts can't be rolled over from one month to the next.	This is a fixed annual charge, so if you don't use up all your daily allowance, it works out as more expensive. Unused texts can't be rolled over from one day to the next.	N/A	N/A	N/A

Information based on a selection of the cheapest Pay As You Go text rate tariffs available. All tariffs are correct at January 2004. This does not include any promotions.

¹ Assumes O2 Bolt On tariff is based on the following calculations - £9.99 monthly charge divided by 200 text messages a month = 4.995p per text message, rounded up to 5p per text message.

² Assumes Orange Text Saver tariff is based on the following calculations - £19.99 yearly charge divided by 365 days = 5.47p a day, divided by 5 text messages per day = 1.09p per text message, rounded down to 1p per text message.

³ Assumes T-Mobile Pay As You Go tariff is based on the following calculations - £12 monthly charge divided by 200 text messages a month = 6p per text message.

Source: Virgin Mobile (May 2004)

Appendix V

Tele 2 businesses

Product area	Fixed telephony	Mobile telephony	Dial-up internet	Broadband	Calling cards	Cable TV
Nordic						
Sweden	★	★*	★	★		★
Norway	★	★	★	★		
Denmark	★	★	★	★		
Finland	★	★	★	★		
Baltic and Russia						
Estonia	★	★*	★	★		★
Latvia	★	★*				
Lithuania		★*		★		★
Russia		★*		★		
Central Europe						
Germany	★				★	
Austria	★	★	★	★	★	
Poland	★			★	★	
Czech Republic	★		★	★		
Southern Europe						
France	★		★	★	★	
Italy	★		★	★	★	
Spain	★		★		★	
Switzerland	★	★	★	★	★	
Portugal	★				★	
United Kingdom	★				★	
Ireland					★	
Benelux						
The Netherlands	★	★	★		★	
Luxembourg	★	★*	★			
Liechtenstein	★	★*		★		
Belgium	★					

* Tele2 Network

Source: Tele2(April 2004)

Questionnaire

- 1) How would you define MVNO?
- 2) What are the main benefits and risks for incumbent operators to enter into commercial agreement with MVNO?
- 3) Do you believe that MVNOs can help with network financing in the 3G environment? How?
- 4) What do you think are key success factors for MVNOs?
- 5) *Do you think that “essential facilities” doctrine might be applicable for the aspects concerning mobile virtual network operators' (MVNOs) access to incumbent operators' infrastructure?
- 6) *Do you think it is reasonable to regulate MVNO issues on European level (and if so to what extent) or remain decision making on National Regulatory Authority (NRA)-(how it is stated in Access Directive)? How the access to 3G networks by third parties might be regulated?
- 7) *What is the role of NRA in dispute resolutions concerning request for access? To what extent NRA should influence incumbent operator's behaviour if it refuses to host MVNO? How the situation may change if incumbent operator owns 3G network?
- 8) *Should the number of MVNOs be regulated in each state?

* Questions 5) – 8) have been sent to the European Commission only

Persons interviewed

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Martin Priborsky, **European Commission**; Competition DG; Directorate C - Information, communication and multimedia; Post and telecommunications and information society coordination, May 6th 2004

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