Understanding Emergent M-Commerce Services By Using Business Network Analysis: The Case of Finland

Tommi Pelkonen
Helsinki School of Economics
Helsinki, Finland
pelkonen@hkkk.fi

Nikhilesh Dholakia
College of Business Administration
University of Rhode Island, USA
nik@uri.edu

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Abstract

Successful m-commerce business models depend on complex networks of business relationships; comprising telecommunications service providers, mobile device makers, financial linkage providers, and various third-party value-adding companies. This chapter discusses such business relationship networks in the context of Finland, and offers general guidance for the formation and sustenance of effective business networks for m-commerce players worldwide.

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M-Commerce and Business Networks

Across the globe, mobile commerce service providers are testing or planning to test a wide variety of business models. One of the striking features of m-commerce business models is the complex network of business relationships needed to create, launch and sustain such services. Such business networks comprise of telecommunications service providers, various types of device makers, payment systems and financial linkage providers, and various third-party value-adding companies.

A key question for m-commerce strategists and their financial supporters is this: What types of business network arrangements work towards promoting early success and long-term sustainability of m-commerce ventures? To seek an answer to this question, it is helpful to:

- Focus on a lead country where mobile telecommunications and m-commerce have developed further than most other places
- Draw from theoretical schemas that help us to understand complex global networks, especially networks that cross the boundaries of many nations.

From the mid-1980s, Finland has been one the leading countries in developing and deploying mobile services, in terms of per capita availability of mobile handset terminals and mobile service accounts. With its flagship company Nokia, Finland is a global technological leader in the development of mobile communication networks and terminals. By the start of the new millennium, a large numbers of new start-up companies emerged in Finland to serve both Nokia's and other companies' needs for mobile applications and service development. Regions such as the Helsinki suburb of

Espoo and the remote Arctic Circle city of Oulu have developed as mini-Silicon Valleys with many startup firms focused strongly on mobile communications and m-commerce.

The number and diversity of agreements, strategic alliances, and mergers featuring firms from Finland and crisscrossing geographical barriers has been staggering. The merger of Sweden's Telia and Finland's Sonera adds to this growing list. This merger represents a step towards the emergence of a pan-Nordic/Baltic telecommunications operator, with the requisite critical mass needed to thrive in that region as well as to make some global impact. Just as SAS – based on the combined strengths of Sweden, Denmark, and Norway – succeeded in the global airline market, the newly merged Scandinavian operator will have a global footprint.

Business network theories have enjoyed decades of popularity in Scandinavia and have been employed to study the internationalization and global linkages of Scandinavian firms. This chapter presents an approach to understanding the mobile telecommunications industry, and especially the emergent m-commerce space in Finland, using the Scandinavian-inspired business network analysis methods. The chapter aims to illustrate the dynamics of the industry by presenting a market model based on business network theories. The chapter draws from studies conducted at the Helsinki School of Economics as well as the experience of the authors.

While the chapter draws mainly from the Finnish experience, the overall objective is to create a generic analysis tool for m-commerce market actors to assess their strategic positions. The key questions addressed are the following:

1) What kinds of actors are there in the mobile telecommunication business, and especially in value-added m-commerce services?
2) What kinds of resources do these actors rely on?
3) How are the various actors related to each other?

4) How do these relationships help or hinder the strategy of each actor?
5) What general lessons can be drawn about the potential success and failure of m-commerce actors and strategies?

This chapter develops the framework first from illustrative analyses of the Finnish situation. Next, the model is outlined in a generic form. Suggestions are then provided for customization of the model for various countries and different market needs. Conclusions and future research directions round out the chapter.

Finland as Mobile Business Pioneer

The Finnish telecom industry dates back to 19th century when the first telecom networks were built into the country, initiated by the Russian Czar and the Finnish autonomous government. Until the 1980s, because of very limited capital resources available in the country, local telecom companies and cooperatives dominated the Finnish telecommunications markets. Yet, the nearly 300 local telephone companies had very talented personnel and Finland's telecom industry, led by the national monopoly company Telecom Finland[1], gradually developed one of the most sophisticated networks in Western Europe. Liberalization and digitization of the telecom network, strongly initiated and steered by the Finnish government, boosted the sophistication of the networks.

Telecommunications rose in importance for the Finnish economy throughout the 1990s. Table 1 shows the rapid growth in the importance of telecommunications for the economy. Telecommunications represented only two percent of total Finnish GDP in 1990 but by 2000 this had doubled to about four percent of the economy. During the

[1] In its early years, like most other telecom firms worldwide, Telecom Finland (TF) operated as a division of the Finnish national post office. TF changed its name Sonera in 1997. Now Sonera and Sweden's Telia have merged.

same period mobile phone penetration rose from a mere five percent to over 70 percent of the Finnish population.

Table 1: Rapid Growth of Finnish Telecommunications Industry

Telecommunications Industry in Finland	**1990**	**1995**	**2000**
Total turnover of telecom companies, mEUR	1428	1861	4364
Telecom turnover as % of GDP	2 %	3 %	4 %
Personnel in the telecom industry	20 067	16 405	24 204
Subscriptions	**1990**	**1995**	**2000**
Fixed network subscriptions, total	2 670 000	2 810 000	2 848 000
Fixed network subscribers/100 inhabitants	53.4	55.0	55.0
Mobile network subscriptions, total	257 872	1 039 126	3 728 625
Mobile network subscribers/100 inhabitants	5.2	20.4	72.0
Public telephones, total	20 229	25 267	12 427
Public telephones/100 inhabitants	0.4	0.5	0.2
Household information	**1990**	**1995**	**2000**
Internet connections/100 households	.	.	31.6
Computers/100 households	.	.	48.2
Fixed network subscriptions/100 households	131.1	128.8	124.1
Mobile phones/100 households	12.7	47.6	162.5
Selected demographic information about Finland	**1990**	**1995**	**2000**
Population	4 998 000	5 117 000	5 176 000
GNP, mEUR (market price)	87967	94953	132038
Consumer price index (1995=100)		100	108

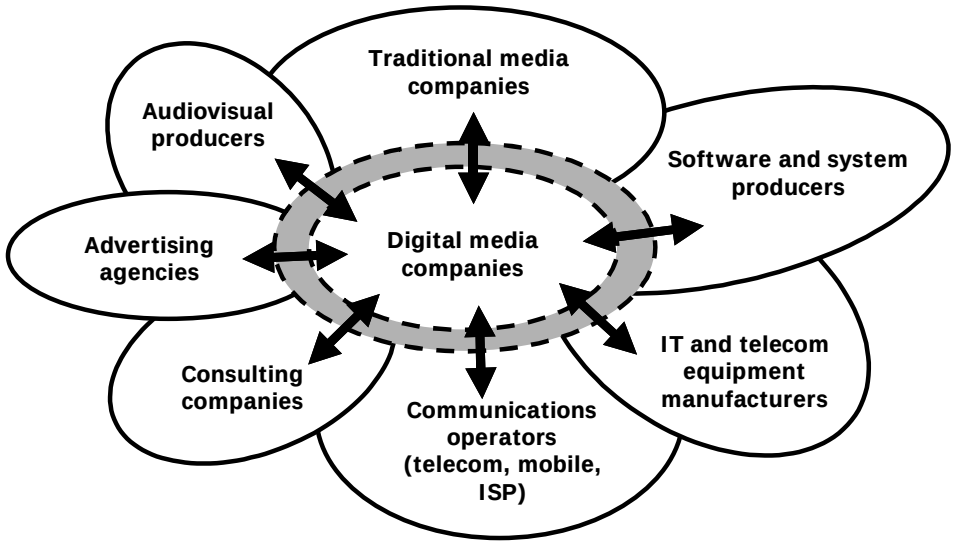
Source: Ministry of Communications and Transport, Finland, 2002

By the end of the twentieth century Finland became one of the leading countries in mobile communications. Nearly 78 % percent of Finns had a mobile phone in 2001 and the market neared the point of saturation (Leppävuori, 2002). Among certain segments, e.g. teenagers and business community, the penetration was nearly 100 %. Public telephones have become obsolete as nearly everyone has a personal portable phone. People moving into an apartment or a house very often forego a fixed connection

and subscribe only to the mobile network. The traditional fixed phone line is used mainly for high-speed Internet connections rather than for voice communications.[2]

The telecommunications sector also forms also an essential part of the Finnish ICT-cluster[3]. Figure 1 presents the structure of the various converging industries, ranging from media to traditional telecommunications. Digital service companies constitute the

Figure 1: Generic model of ICT-cluster



Source: Kuokkanen, Toivola and Väänänen (1999)

core of the cluster. Digitization of information had dramatic impacts on end users and ICT-companies. Digitization allowed ICT firms to start producing and offering innovative services that 1) were totally new to end users, 2) increased geographical reach of existing digital and offline services and/or 3) offered cost-cutting opportunities for organizations adopting new digital technologies. Finnish companies have also been very active building the digital communications infrastructure and developing new services.

[2] The USA-based author of this chapter had an interesting experience in Helsinki in 2000. From his apartment in Helsinki, the author called the mobile phone of a Nokia executive. The Nokia executive said: "I was surprised to get this call. I hardly ever get a call from a fixed line!"

[3] ICT refers to Information and Communications Technologies.

In 1999, the total turnover of the Finnish ICT-cluster was estimated to be 34 billion euros (nearly 25 % of Finnish GDP) and the ICT-related activities employed around 146,000 people (about 6 % of the total work force).

Table 2: The Finnish ICT-Cluster 1999

	Manufacturing	Service Creation	Communication Services	Content Production
Turnover (in euros)	▪ 16.3 billion	▪ 8.6 billion	▪ 3.7 billion	▪ 5.5 billion
Personnel	▪ 43,800	▪ 42,000	▪ 19,000	▪ 41,000
Key products and services	▪ Communication equipment ▪ Computers ▪ Consumer electronics ▪ Electronics components ▪ Measurement and automation equipment	▪ Software and system production ▪ Professional business services and consulting ▪ Wholesale of products	▪ Mobile communication services ▪ Fixed network services (telecom-data and value added services))	▪ Printed communications ▪ Electronic publishing ▪ Offline media ▪ TV- and radio broadcasting ▪ Information services
Total ICT-cluster in Finland	▪ Turnover 1999: about 34.1 billion EUR ▪ Personnel: 146,000 employees			

Source: Adapted from Meristö, Leppimäki and Tammi (2002)

In recent years, mobile telecommunications has been one of the most rapidly developing sectors within ICT. Finnish companies as well as users have been very open to modern technology and Finland has become an interesting lead market for mobile development. By 2000, several venture capitalists began investing in Finnish start-up companies to explore and learn about the possibilities in the mobile markets. In the next section, we look in detail at the structure of the Finnish mobile telecom markets.

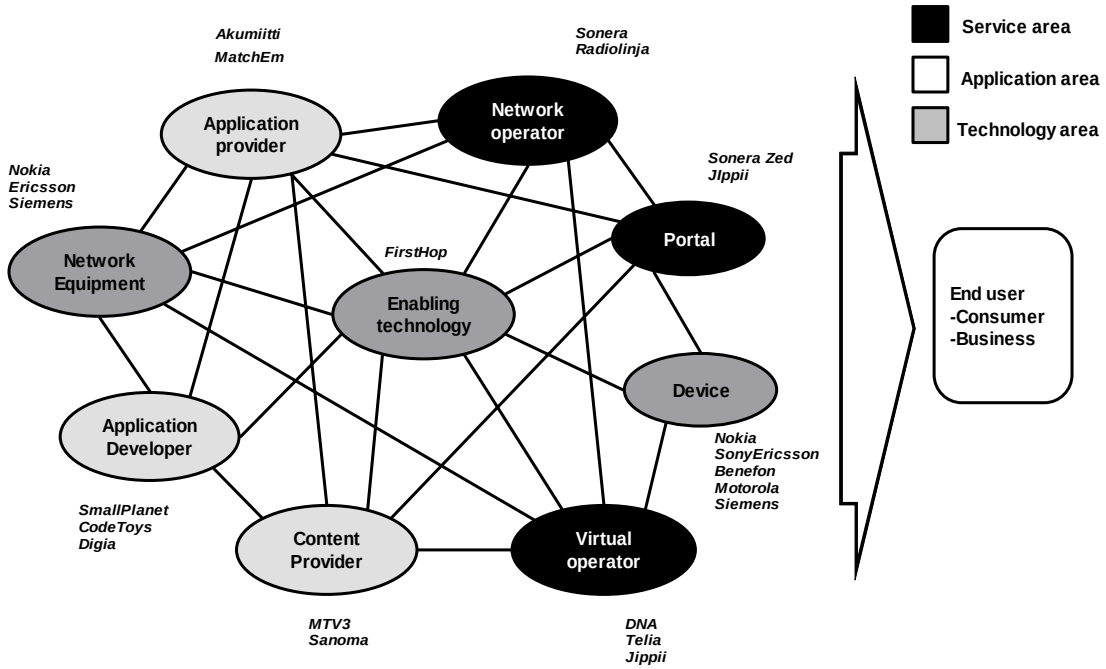
Finnish M-Commerce: A Business Network Approach

Actors in the Finnish M-Commerce Space

Durlacher (2001) and Leppävuori (2002) have described mobile telecom markets as special types of business networks called *value-webs*. They have identified the core actor groups and their relationships. In this section, we illustrate a part of the value-web in Finland, and then develop it more generically in later sections.

First, the Durlacher value-web divides mobile telecom actors into three main areas: 1) Services, 2) Applications and 3) Technologies. Finnish telecom operator (e.g. Radiolinja, Sonera, DNA) and mobile portals (e.g. Sonera Zed) comprise the *service area* of the Finnish m-commerce value-web. The *application area* of the Finnish value-web consists of traditional content creators such as media companies (e.g. MTV3, Soneraplaza, Sanoma) and small start-ups creating or aggregating applications (e.g., SmallPlanet and MatchEm). Finland's leading technology company, Nokia, dominates the *technology* area of the country's m-commerce value-web. The giant is active in all the three technology areas. Nokia's two core businesses – mobile handsets and network equipment – make this company a very crucial partner for nearly all other Finnish mobile telecom actors. Figure 2 presents in more detail the Durlacher approach to telecom value-webs, with illustrative firms from the Finnish context.

Figure 2: The Mobile Value-web in Finland

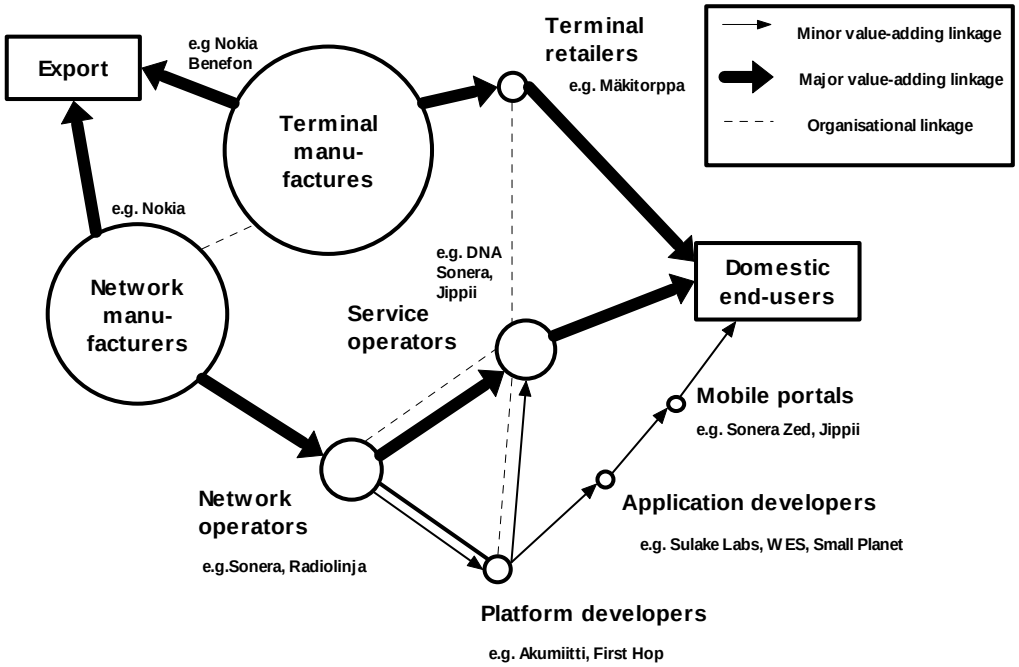


Source: Modified from Durlacher, 2001

Leppävuori utilized the Durlacher model to illustrate the power balance within the Finnish telecommunications landscape. The network model of Figure 3, as also the chart in Figure 4, presented later in this chapter, illustrate dramatically the strength of Nokia within the Finnish telecom markets. The application or platform development efforts of small start-up companies in mobile services have only a marginal impact on market development – indicated by the thin arrows (Figure 3). Telecom operators possess some market power, especially in relation to domestic end-users. Accessing export markets, however, is very challenging for both the telecom operators and mobile start-ups. Only Nokia has a strong global reach into export markets (Figure 3). Recently, the largest

Finnish media companieshave taken their initial steps in internationalization. E.g. Sanoma Magazines has become one of the leading European magazine publishers[4].

Figure 3: The distance/magnitude value network of the core actors in the Finnish mobile cluster



Source: Adapted from Leppävuori, 2002; enhanced by authors

Resources

Personnel

Telecom sector has for long been dominated by technology and engineering skills. Finland is well known of its talented engineers, e.g., in paper industry and machinery, and the Finnish telecom sector is no expectation to this. In the mid-1990s, Finland's technical universities increased their student intake for telecom-related studies and were able to respond quite rapidly to the increasing human resources needs triggered by the constant international growth led by Nokia and its partners.

[4] See e.g. Medialinnakkeet.com for more information

For Finnish mobile telecom related companies, a major challenge has been to find and retain people who have enough experience in international IT service business. Traditionally, Finnish organizations have been excellent in developing technology, but short-staffed in experienced sales personnel. During the mobile boom towards the end of 1990s, this shortage of experienced sales personnel struck hard. Venture capitalists financed innovative technology development, but only a few Finnish companies were able to create revenue on investment. Skill sets of the start-up companies were aimed at research and development, instead of sustainable business development.

Financial resources

Finland has been one the model countries for industrial growth since World War II. It transformed from mainly an agricultural economy in the early 1950s into one of the leading high-tech economies by the end of 1990s. Yet, the country's capital accumulation has been very limited. Capital market liberalization in the 1980s opened the doors to foreign investment. Still, for most entrepreneurs, the only viable options for financing business development were through commitment of personal and family savings, and bank loans. Risk-based venture funding and stock market financing existed only minimally. It took nearly ten years for venture capitalists and business angels to really start investing into Finnish companies. At the peak of the hype, the first quarter of 2000, major financial investors were either actively investing in or actively seeking high-tech start-ups to invest in.

The sudden increase in venture capital flowing into the country created multiple side effects. Investors did not have the time evaluate in detail the feasibility of the business models and capabilities of most start-up companies. Investments were made

with minimal planning and high risk. For mobile start-ups the situation was very lucrative. With a credible “mobile story, ” substantial capital could be attracted to support the establishment of new businesses and to commit to expenditures for very rapid projected growth. With complex revenue-sharing-based business models, many of these start-up companies promised to launch into “international exponential growth”. Few of these start-ups survived. The capital collected was spent and additional venture financing was no longer available. Yet, for some start-ups the promised markets did open up – and venture financiers remain optimistic about the prospects of Finnish mobile start-ups and continue to expect good longer-term returns for their risks.

Hardware

Finnish telecom companies have been pioneering multiple technology solutions. Finland was one of the first countries to have a fully digitized telecom network, as well as one of the first countries to offer excellent trunk networks for data carriage. In September 2002, Nokia introduced its first 3G phone within Sonera’s network and demonstrated its commitment to Finnish know-how. Both wired and wireless networks are among the leading ones in the world. These offer attractive test environments for a variety of mobile solutions.

Customers

Finnish mobile technology companies were in a very favorable domestic environment during the 1990s. Several players were investing heavily into high-tech innovations and e-business solutions. Mobility was seen as a key high-tech area and investor interest in mobile companies’ activities was high. Multiple trials were carried out for mobile salesforce automation and mobile commerce. Furthermore, Finnish consumers were eager to try out mobile applications (such as SMS chatting, SMS dating, TV voting,

etc). By 2002, media companies (e.g. MTV3) started play a stronger role in m-business. This trend continues to intensify (Karlsson, 2002). These media companies offer their customers interesting content on TV screens, desktop screens, and now also via mobile channels.

Relationships

Being in the northeast corner of the European Union, Finland lacks the geographic centrality to network its business people into other markets. Only few multinational companies have emerged from the country (mainly within forest and metal industries). Nokia's has changed this pattern radically. Not only Nokia's own personnel, but also its subcontractors and clients have been able to enter into circles much larger than the small Finnish domestic markets. Learning from these operations has been very fruitful for the total Finnish economy.

The mentality of the Finnish business community has also changed. More companies have started to consider themselves as being a capable and skilled part of the international business community, instead of being a minor actor from "the unknown northern dark country". The domestic networking, often initiated by the national research projects (lead by e.g. The Finnish Technology Foundation, TEKES), has provided excellent opportunities for mutual learning within Finland. Yet, there is still a lot to be learned. Finns are new to service businesses. International markets demand massive and long-term investments from the Finnish companies. Being a domestic league champion offers no guarantee of becoming an influential player in the highly competitive international markets.

Strategies

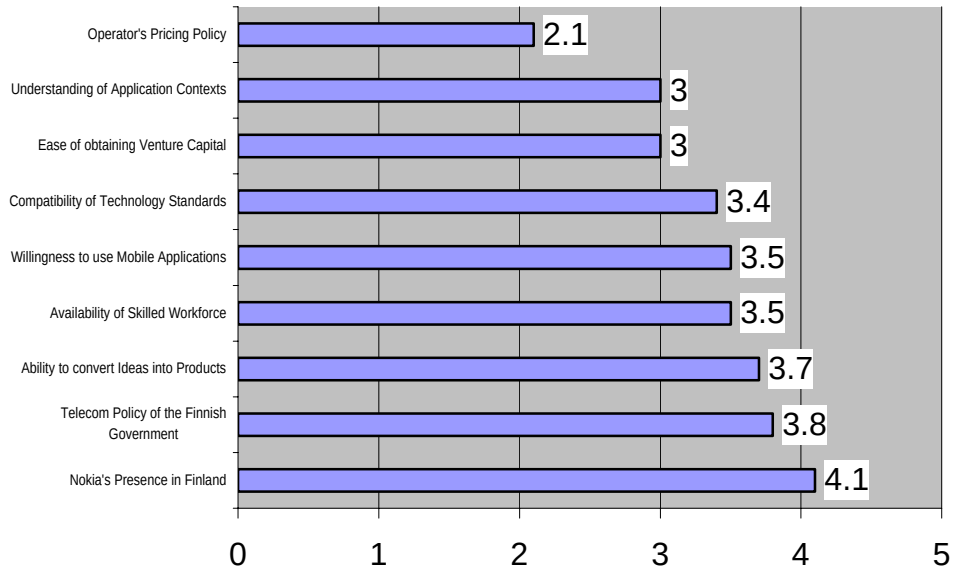
During the strongest hype, it seemed that the main focus of mobile companies was to grow at any cost. Capital obtained from investors was spent into expensive international operations and acquisitions. There were strongly held beliefs about "technological pioneering" and about "growing as Nokia did". For a short time, such aggressive expansion strategies boosted the valuations of these companies. Yet, with few exceptions, these commitments became unbearable burdens for the Finnish start-ups – international operations demanded skills and know-how in areas that the companies did not possess.

Only few companies understood the realities of business networks – building sustainable positions in international markets demands much more than sophisticated technological know-how. The largest customer markets (e.g. Germany, France, UK, and the U.S.) are distant from Finland. During 2001 most of the small start-up Finnish companies lost their advantage of being the pioneers of mobile technology[5]. They could not turn the hype surrounding them into profitable customer relationships.

In his research of Finnish mobile start-ups and markets, Leppävuori found the operators' pricing policy to be a significant negative factor impacting the development of the Finnish m-commerce sector. While offering their solutions to Finnish and to various European operators, Finnish content and application focused companies have faced 80/20 revenue sharing demands, with operators retaining 80 percent of the revenue. This is in sharp contrast to Japan, where the revenue sharing is 10/90, with nearly 90 percent of the revenue flowing back to application developers. It is no surprise that mobile content companies are succeeding in Japan.

The role of the Finnish government in boosting mobile telecom development, as well as Nokia's crucial role, feature prominently in Leppävuori's findings. Nokia is the largest Finnish multinational company and the Finnish economy has become very dependent on it. When Nokia launches new mobile phone models, such news makes front-page headlines in Finnish media. The immense centrality of Nokia is a boon in booming economic times, but poses big risks when Nokia itself is in a downturn.

Figure 4: Factors influencing the development of mobile services in Finland
(Source: Adapted and modified from survey of 102 respondents by Leppävuori, 2002
5= promotes highly; 1=slows down the development)



[5] By 2002, Japan and South Korea were being mentioned as the most advanced mobile countries globally.

Some Short Case Studies

We now turn to some interesting case studies of small Finnish m-business companies[6]. With nearly 200 digital media startup firms in Finland, the selected cases (shown as boxed items) only provide an illustrative snapshot. Two of the profiled cases no longer exist but they are profiled because of their groundbreaking approach to relationship creation for leading IT and entertainment business brand names.[7]

Riot Entertainment, www.riot-e.com

Year of founding:
1999, outcome of a merger between three smaller companies

Short description of activities
Riot-E was created as a leading aggregator of mobile entertainment and gaming content solutions. Riot-E promised to take leading entertainment brands into the mobile environment. Riot-E offered expertise in mobile technology, business and direct relationships to mobile operators worldwide, as well as linkages to equipment manufacturers. Excellent timing of company's market entry and active business networking brought Riot-E into very fruitful and promising business deals with entertainment brands such as Marvel and New Line Cinema. Furthermore, Riot-E was very flexible and innovative in its business models with the operators. It was focused on delivering value-added for them. Yet, its main challenges were creating a constant and stable revenue flow. The company obtained nearly 5 million euros as capital investments and expanded its operations very quickly. At its peak, Riot-E had over 100 employees and operations in seven countries. Riot-E's business plan was built on an aggressive growth strategy. This high-risk approach led to initial business deal success, but the global ICT crash brought the growth to a standstill.

Status as of late 2002:
Riot-E went into bankruptcy after prolonged third round financing negotiations. Merger with another mobile entertainment company was also considered. While Riot-E did not survive, several of its personnel were able to leverage their accumulated know-how of the global entertainment business in new entrepreneurial activities.

[6] The case studies are based on publicly available news materials from www.digitoday.fi, www.talentum.com and www.itviikko.fi

[7] A comprehensive listing of Finnish companies operating in the ICT industry can be found at: e.g. http://www.swbusiness.fi/

CodeToys **www.codetoys.com**
Year of founding:
1998 (2001 merger of two leading mobile entertaiment companies, CodeOnLine and SpringToys)

Short description of activities
CodeToys develops mobile entertainment solutions for operators and mobile portals. The company has gain worldwide publicity with its mobile versions of the popular “”Who Wants to be a Millionaire?” and “Trivial Pursuit” games. Furthermore, the company has closed deals with several major entertainment companies such as Disney and Universal. In addition, the CodeToys obtained a sound third-round financing from a group of international financiers (Bertelsmann Capital Ventures, AOL Time Warner Ventures and Motorola) to secure its position in the mobile arena.

Status as of late 2002
CodeToys keeps on developing solutions for its customers. The ICT downturn has created major challenges. Yet, secured by its financiers, its future seems still promising.

First Hop (www.firsthop.com)
Year of founding: 1997

Short description of activities
First Hop started its operations as a subcontractor for web design agencies. The company rapidly developed its competencies, especially in Java-based solutions. First Hop created its own software products for online and mobile publishing and content management platforms. First Hop obtained venture financing and had international customers for its solutions. First Hop has been judged to be one of the most promising mobile developing companies offering solutions to telecom operators and directly to corporations. Yet, like other Finnish startups, it has faced growth challenges and major profitability pressures from its financiers.

Status as of late 2002
First Hop continues to operate and develop its solutions for its customers. Latest expansion has been to start providing solutions to Southeast Asia.

Sulake Labs (www.sulake.com)

Year of founding**:**
1999, as a joint start-up with enthusiastic entrepreneurs and support from an ad agency

Short description of activities
Springing from the hobby of its multimedia-enthusiastic founders, Sulake Labs created one of the first truly profitable "virtual goodie" environments. Their concept "Habbohotel" is a virtual 3D community in which registered members can interact, move, chat, play games, dance, etc. Furthermore, users can create their own rooms in which they can purchase virtual furniture and other decorations with their mobile phones. Surprisingly, the concept has proven to be very successful and Habbohotel has several thousand active members. The original Finnish operation, "Hotel Kultakala", is offered in cooperation with Finnish telecom operator and has become profitable for both parties. In addition, the solution has won several awards in international digital design contests.

Status as of late 2002
Sulake continues to develop its technology solutions. It has opened its Fuse software solution for developers worldwide. Sulake has also expanded into international markets with operations in the U.K. and elsewhere

WapIt (www.wapit.com)

Year of founding: 1999

Short description of activities
WapIt is often seen as the pioneer of the Finnish mobile start-ups. It was among the first startups to obtain millions of venture capital for its international growth. It gained high publicity (e.g. in Business Week, Economist and Financial Times) as being one the first global mobile solution companies. It pioneered in revenue share-based business models with the operators. It was among the first companies to expand its operations with partnership deals with Hewlett-Packard and Nokia. Finally, however, WapIT also pioneered as one of the first mobile companies to crash. The company had tied itself into unfinished technology, and became a victim of the overall troubles of WAP. Its business plans were based on exponential consumer adoption of mobile solutions. The rosy expectations, strong publicity, and technology forecasts allowed WapIt to attract investors (such as Durlacher) worldwide. Yet, the planned business never materialized. Though having innovative solutions and technology, the company had to discontinue its operations in 2001.

Status as of late 2002:
Have run out of additional financing, WapIt filed bankruptcy in 2001.

Iobox (www.iobox.com)

Year of founding: 1999 as a startup

Short description of activities
Iobox was one of the first Finnish companies to start offering free web-based e-mail to its registered users (as GNWmail service). In 1999 it changed its name into IoBox and started offering mobile e-mail and calendar access, as well as ringtones and operator logos. Company obtained venture capital and expanded rapidly into international markets. In 2000, the company was acquired by Spanish telecommunications operator Terra Movile at the high price of nearly 160 million euros. Promising expansion turned into rapid downgrading in 2001. Subsequently, Iobox discontinued its Finnish operations in late 2001 and focused purely on major European markets. Iobox was also integrated more tightly into its Spanish parent's operations.

Status as of late 2002:
Iobox continues as part of Terra. It operates currently in four countries (UK, Germany, Spain, Brazil). It still has a few Finnish employees. The company, however, has totally withdrawn from Nordic operations.

Jippii (www.jippii.com)

Year of founding: 1997 through a merger of Finnish ISPs (initial name Saunalahden Serveri)

Short description of activities
Jippii was created originally as a challenger in the rapidly developing Finnish Internet service provision markets. During the hype, Jippii also entered the mobility markets. The company was among the first portals and virtual mobile operators to start offering "goodies" like mobile phone ringtones and operator logos to its users. Very rapidly, this virtual "goodie" business brought Jippii from high losses into nearly profitable business. In its aggressive expansion into international markets, Jippii entered into German local access provisioning business. This operation became nearly fatal for the company. Jippii had to withdraw from Germany at a very high cost and obtain rescue financing from its main investors.

Status as of late 2002:
Jippii has recently stabilized its position among leading Finnish portals. It is still offering innovative mobile solutions for its customers. Yet, it is more and more focused on core operations – Internet access provisioning, especially offering broadband solutions.

Sonera Zed (www.zed.com)

Year of foundation: 1999

Short description of activities
Springing from its domestic mobile phone service operation, Sonera formed its internationally focused mobile portal in 1998. Zed was one of first mobile portals and immediately created very high expectations throughout the business community. The company was estimated in early 2000 to be worth billions of euros if publicly listed. Sonera invested tremendous amounts of money into Zed's expansion into European markets and brand creation. Yet, high investments brought back only marginal revenue. The consumers were not convinced with Zed's WAP and SMS-based offerings. Zed was making money with operator logos and ringtones, but not enough to cover the investments put into it. In early 2001, Sonera planned listing the company but the plans were postponed due to the downturn. Zed withdrew several of its plans and went into massive restructuring of its operations.

Status as of late 2002:
Yahoo! Mobile acquired 15 % share of Zed from Sonera in 2002. Yahoo has also an option to acquire the rest of the company. Currently, the two companies are planning marketing cooperation and possible joint development projects.

Some Lessons from Finnish Pioneering Cases

The mobile sector is very much in a flux. The early cases described here, however, do yield some important lessons for m-business success:

- Simple, entertaining items – games, ringtones, logos – have significant revenue potential if volume can be built up and sustained.
- Business network relationships, especially with deep-pocketed operators, offer a substantial degree of financial flexibility and thereby the ability to reorient the business models. In terms of Figures 2 and 3, the proximity and strength of relationship of a startup to the telecom network operator seems to improve survival chances and prospects for financial viability.
- Business models based on unproved technologies and on assumptions of enduring exponential growth are extremely risky.

In the sections to follow, we provide the conceptual elements that can help in explaining the Finnish pioneering cases as well as assist in future m-business strategies the world over.

A Generic Business Network Model for M-Commerce

Business Network Theory

Researchers attempting to understand the developments in the mobility-related markets suggest utilizing business network theories as the appropriate descriptive and analytical approach to grasp this sector (Durlacher, 2001; Leppävuori, 2002). These theories originate from the groundbreaking work of the Scandinavian-English IMP-research group (Håkansson & Johansson, 1992; see also Håkanson & Snehota, 1994; Johansson & Mattson, 1988 and Axelson & Johansson, 1992). Originally the researchers working with business network theories analyzed dyadic relationships between industrial buyers and sellers. More recently, the approach has been widely accepted to describe markets as *value-webs*, networks of interconnected actors each possessing limited amounts of resources and each performing specific market activities. Activities are performed to obtain as dominant a market position as possible.

Business Network View of Mobile Telecom Markets: Activities and Resources

Mobile telecom markets can be viewed as business networks wherein a variety of actors – operators, governments, infrastructure providers, device makers, value adders, users, and so on – possess resources, perform activities, and are in relationships that are established or evolving. The resultant interactions influence the market positions of the actors. To begin analyzing mobile telecommunications from a business network perspectives, we first look at the market activities (Table 3). These are the operations that companies, organizations, and individuals carry out in the market. Mobile telecommunication business activities can be categorized into 1) main activities and 2) supporting activities. At the core of telecom business (fixed or mobile) are *access provision*, *data delivery*, *service provision* and *service hosting activities*. These are supported by multiple other activities such as advertising, training, and content creation. Furthermore, in the telecom industry multiple types of equipment are required. Thus, 3) *equipment manufacturing and maintenance* form one activity area. Companies invest in development of new solutions for their customers and this 4) *research and development*

Table 3: Mobile Telecom Business Activity Set

Core Activities	Supporting Activities	Infrastructure-related Activities	Research and Development Projects	Business Network Building Activities	Creation, Enforcement of Market Rules
▪ Access provision ▪ Data delivery and transport ▪ Service provision ▪ Service hosting	▪ Advertising (traditional and digital media) ▪ Consulting ▪ Training ▪ Content creation ▪ Content aggregation	▪ Equipment manufacturing ▪ Software production ▪ Network building & maintenance	▪ Own R&D projects ▪ Joint R&D projects	▪ Formal and informal negotiations on financing, project cooperation ▪ Subcontracting agreements ▪ Research and development	▪ Regulations ▪ Laws ▪ Standards

Source: Modified and adapted from Pelkonen, Pohto and Wirén 2001b

is carried out by an actor's own or joint efforts. In addition, companies constantly aim to strengthen their strategic positions by a variety of 5) *business network building activities.* These entail formal and informal negotiations, different ways of subcontracting and outsourcing, and joint research and development. Finally, various governmental and industry organizations also aim to influence and standardize the competition terms in the markets by 6) *market rule creation and enforcement activities.* Table 3 summarizes the business activity set of the mobile telecommunications sector.

Mobile telecom business activities are based on various resource pools. These can be categorized into human, software, hardware, organizational, and financial resources (see, e.g., Holmlund & Kock, 1995). The key resources for operation are the company's employees. Also, telecom operations are very capital intensive and require substantial investments into switching equipment and transmission networks. Thus, these form the

Table 4: Mobile Telecom Business Resource Set

Human	Hardware	Software	Organizational	Financial
• Management • Technical • Design • Maintenance • Service • Sales • Marketing • Other	• Office premises • Production machinery • Personal computers & servers • Network equipment • Cables and control equipment • Locations for network equipment	• Licenses • Intellectual property rights • Proprietary contents • Production process knowledge • Knowledge about technology • Knowledge about customers • Production software	• Strategies • Goals • Organizational culture • Organizational structures	• Finance for operations (e.g. R&D, commercialization, internationalization) • Capital valuation in the stock market

Source: Modified and adapted from Pelkonen, Pohto and Wirén 2001b

second key resource group. The telecom business resource categorization is presented in some detail in Table 4.

Business Network View of Mobile Telecom Markets: Actors and Relations

There are a variety of mobile telecommunications market actors. The core actors are the *telecom network operators.*[8] The operators possess the key understanding of the telecom service users: consumers and corporate customers. Through their business development efforts, the operators generate revenue opportunities from the users. In fact, the end users represent the one and only sustainable revenue source for all market actors. The money exchanged over usage of telecom services originates from the end users and is distributed among the other actors in the marketspace. Almost without exception, the network operator holds a dominant or at least controlling position in this crucial monetary flow.

Also connected directly to the end users are also various *mobile media (portals*). These are either business activities of the network operator or of an external party. If an external actor is the portal provider, the activities of such an external actor remain nearly

Figure 5: Generic Content Creation Process

[8] In mobile telecommunications there are two kind of network operators: 1) a mobile network operator (MNO, incumbent operator) builds and operates its own network, while 2) a mobile virtual network operator (MVNO) rents transmission capacity from the MNOs but operates under a separate brand and with separate customer billing systems

always dependent on the business relationships between network operators. End users are, in most cases, charged only via the mobile operator's billing systems regardless of the type of third party or value-added service usage. At their inception in 2000, mobile portals attracted major interest in the business community as new media, but their success so far has been limited[9].

For a mobile portal or a network-delivered service to be useful, interesting content needs to be created. For this, various content-related actors are needed. The process of content value creation can be described as a five-step process (see Figure 5) [10]. Mobile telecommunications follows this typical content creation chain and each step can have its specialized actors. A mobile portal or an operator most often carries out content marketing. The operator nearly always handles the distribution of content.

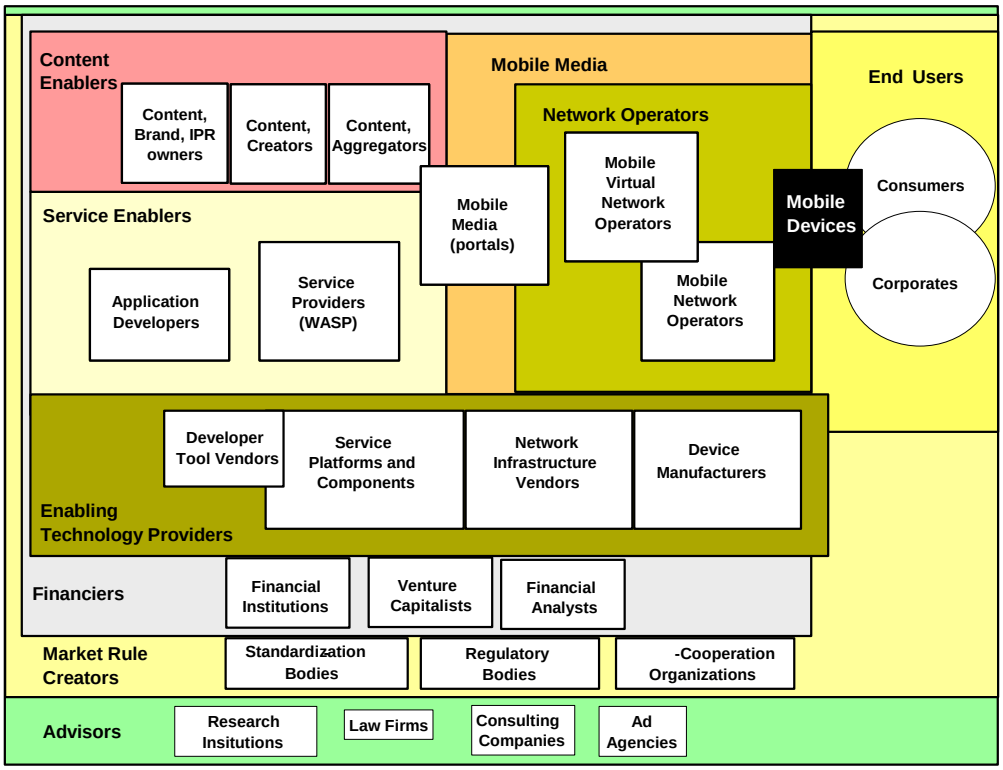
It is technology-oriented companies that have mainly formed the mobile industry. These could be categorized into two main categories: *service and application enablers* and *enabling technology providers.* The former consists of companies that develop and market their solutions (normally software products) to mobile operators or mobile media, occasionally also directly to corporate end users and even to consumer markets. The latter can be further categorized into four main groups: 1) developer tool vendors, 2) service platform and component creators, 3) network infrastructure vendors and 4) device manufacturers. These companies sell their products mainly to telecommunications operator globally. Yet, they have also direct customer relationships to service enablers and mobile mediums. In addition, mobile device manufacturers sell their product to end users through their own distribution channels.

[9] See e.g. http://www.gsacom.com/, Mobile Portal Surveys
[10] Such a model can be applied to any content creation business, be it telecommunications or another sector.

The m-commerce business field involves several connected actor groups. *Financiers* seek profitable investment targets. In the period of upturn in the 1990s, large risks were taken by seeking companies with strong chances for success and then investing in such firms. Only few of these investments have proved viable. A large number of ventures failed to fulfill their business plans and ran short of money. This is bound to impact the industry's prospects at least in the short term. *Regulators* and standardization organizations work as the market rule creators for companies in the m-business fields. Since early 1990s, their impact has been important to the whole industry due to increasing global telecom deregulation. Finally, as in any business, a large number of *advisory service companies* also operate in the mobile communications field. These include legal, marketing and business advisors as well as various research institutions.

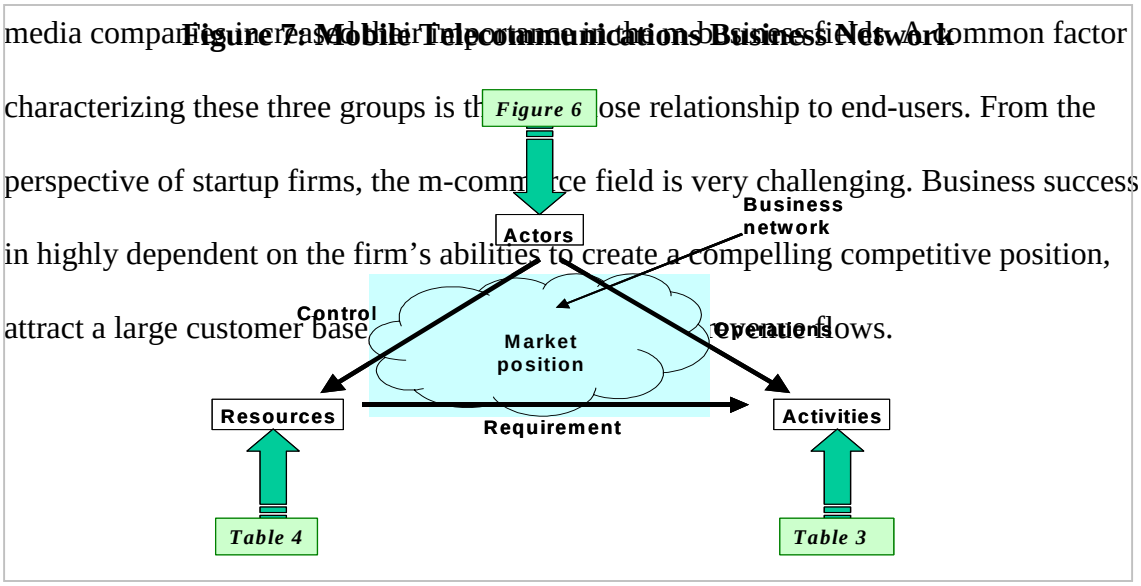
The business field of mobile communications could be illustrated as an actor web (see Figure 6). On the top of the figure is the content creation value chain, while below it are the related actor groups.

Figure 6: Mobile Telecommunications Business field



By combining the business network elements of Actors, Resources, and Activities, an overall business network model for mobile telecom can be formed (see Figure 7). Telecom actors compete and cooperate to obtain the most valuable, skilled and scarce resource pool to perform their activities. Very often, due to their history and control over the end users, telecom operators hold a very dominant position in the markets. The second powerful market group is the equipment manufacturers. By 2002, media companies gained their importance in the business fields. A common factor characterizing these three groups is their close relationship to end-users. From the perspective of startup firms, the m-commerce field is very challenging. Business success is highly dependent on the firm's abilities to create a compelling competitive position, attract a large customer base and operate flows.

Figure 7: Mobile Telecommunications Business Network



For mobile application developers and content-oriented startups, a lot of partnering is needed for successful business operations. As mentioned earlier, ultimate business models have to rely on increased revenues from the end users. In practice, this means that the network operator has to obtain a higher ARPU (Average Revenue Per User) by offering its customers – the end users – services that the end users are willing to pay for, at levels over and above the charge for their conventional mobile voice and data usage. It is this incremental revenue that the operator is able to share with application developers, technology enablers, and content enablers. Such incremental revenue has so far proven to be elusive, at least in the European markets. Increments in revenue through offering these value-added services have been much smaller than expected. Therefore, the business plans based on revenue share based earnings models for start-ups have very often failed.

Conclusions and Future Directions

Understanding Own Position and the Resource Pool

In the mobile business, positioning oneself in the competitive landscape is of utmost importance. Increasing pressures for revenue generation characterize the current, emergent phase of this industry. For all industry actors, this leads to seeking either more sales or more efficiency through own efforts and via joint activities. This calls for relationship “orchestration”, based on own internal and potential partner’s resources, and seeking competitive advantages via efficient resource utilization as well as creative resource blending.

The main challenge for the several pioneering mobile Finnish companies was to obtain and allocate their resource pool to match with the ambitious growth strategies.

High risks were taken in business expansion, often beyond the limits of the firm's control. A few firms benefited from being among the first movers within the mobile arena, but for many these risks became overwhelming. In this dynamic and emergent period, the mobile industry keeps on transforming quarter-to-quarter; only time will tell which of the Finnish m-business companies would survive in the long term.

Identification of Crucial Partnerships and Activities

Planning and implementation of network-based business operations can be very challenging. The mobile business-network framework presented in this paper is geared to help companies and researchers identify and analyze the market positions of key actors. The business-network diagramming and assessments can be used to map the firm's own position and the positions of external actors, resource profiles, business activities, and partnering actions. The partner search should not be confined to the traditional geographical limits of the company. Instead, strategic match seeking should be extended to international markets. This is especially necessary for m-business companies based in small economies, such as Finland.

In most global markets, the mobile telecom operator holds the pivotal position for revenue generation. In some countries, the dominant actor can also arise from other parts of the value-web, such as device and equipment maker Nokia in Finland. In the converging ICT-landscape, important strategic positions can also arise from surprising areas such as the success of TV-channels in SMS+TV+Chat solutions. The telecom operators, however, have the most entrenched customer base, functioning billing systems, and understanding of consumers' mobile phone usage patterns. In addition, the operators either operate own or leased mobile networks. For mobile startup success, creating

smooth-functioning relationships with operators is undoubtedly a key requirement. If a startup cannot provide sustainable revenue generation streams from the operators' end-users, then it cannot be viable in the long run.

An alternative to sustained operator relationships is to have a short-term business focus with aggressive marketing and brand creation. During the ICT-hype of the 1990s, these kinds of operations were sufficient for startups. In the future, the situation would be far more challenging. M-commerce firms need to show recurring returns on investment, not just short-term revenue potential but also sustainable long-term revenue streams.

Mobile Earnings Logics

Multiple revenue-sharing-based business models have already been tested across global mobile markets. Yet, pioneering experience from Finland has shown that the trend is from complex business models to simpler ones. Advertising, subscription fees, and transaction commissions have remained as the main revenue generators. Early experience indicates that business models based on shared micro-payments – sharing the end users' fractional euro/dollar payments for ring tones or icons – are very challenging to administer and sustain. As content aggregators, mobile media (portals) have benefited from such micro-payment-based revenue but the revenue passed backward to individual content creators or application vendors has been marginal. The start-ups have been given only minimum shares of the possible revenue from mobile innovations that these start-ups created and made available to the portals or operators.

As mentioned frequently in this chapter, controlling the customer information is critical for market position improvement. The actors that can actually send the bill to the end user– mostly telecom operators – hold the key role in the mobile value-webs.

Regardless of technological development, this reality will not change. Mobile start-ups sometimes aim to bypass the telecom operators by offering their own access gateways and service portals. Yet, obtaining a critical and sustainable mass of paying customers for such specialized gateways is not easy. Telecom operators, regardless of their current downturn, have deep pockets to fund the high investment costs required for m-commerce operations. Start-ups, especially after the dotcom crash, are struggling with their survival and are thus in very weak competitive position. Telecom operators may end up acquiring innovative, but resource-starved start-ups at bargain basement prices not reflective of the long-term value of such start-ups.

By 2000, throughout the mobile industry landscape, actors started facing harsh economic realities. The time for hype was over; and the mobile industry was becoming a business similar to any other business. Free lunches – in the form of fast and loose venture capital – ceased to exist, and business models with long-term viability became the key to success. The Finnish experiences outlined in this chapter, along with concepts from business network theories, should help m-commerce players make their business models viable and robust.

References

Durlacher Ltd. 2001. UMTS Report: An investment perspective. Durlacher Research Ltd., London

GSM-Association. 2001 (ongoing). Mobile Portal Surveys, http://www.gsacom.com

Holmlund, M. & Kock, S. 1995. *Buyer Perceived Service Quality in Industrial Networks*. Industrial Marketing Management. 24. pp. 109 - 121

Håkansson, H. & Johanson, J. 1992. A Model of industrial networks. In Industrial Networks: A new view of reality. Routledge, London. Pp. 28-34.

Johanson, J. & Mattsson, L-G. 1988. *Internationalisation in industrial systems - a network approach*. In Strategies in global competition. Croom Helm, New York. Pp. 287-314.

Håkansson, H. & Snehota, I. 1992. *Analysing business relationships*. In Developing relationships in business networks. Routledge, London. Pp. 24-49.

Karlsson, J. 2002. Mobile Earnings Logics. Lecture at Mercuria Business. School. Oct 2, 2002. Vantaa.

Kuokkanen N., Toivola T., Väänänen T. 1999: Uusmediatoimiala Suomessa 1999. LTT-Tutkimus Oy. Helsinki. www.uiah.fi/mediastudio/tutkimus.html

Leppävuori, I. 2002 Analysis of the Finnish mobile cluster - any potential in mobile services., Ministry of Transport and Communications. Helsinki http://www.mintc.fi/www/sivut/dokumentit/julkaisu/julkaisusarja/2002/a282002.htm

Meristö T., Leppimäki S., Tammi, M. 2001. ICT-osaaminen 2010 – Tietoteollisuuden ja digitaalisen viestinnän osaamisen ennakointi, Åbo Akademi/Institute for Advanced Management Systems Research, CoFi Report 1/2002. Turku.

Pelkonen T., Pohto P., Wirén L. 2001: Uusmedia aikuistumisen kynnyksellä. Uusmedian osaamiskeskus ja LTT-Tutkimus Oy. Helsinki. http://www.uiah.fi/koulutuskeskus/uusmedia.pdf

Pelkonen, T. 1999. Resource-based internationalization of professional business services – a case study of the Finnish new media industry. Helsinki School of Economics, Master's Thesis. Helsinki