

## THE TRANSFORMATION OF THE SWEDISH TELECOM MARKET

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### ABSTRACT

The Swedish telecommunications market has emerged as one of the most liberalized in the world undergoing a profound transformation. In this paper the essence of the transformation is illustrated by empirical examples from an industrial network perspective. The transformation is then interpreted and formalized into a number of hypotheses about how industrial networks evolve.

### INTRODUCTION

Most OECD-telecommunication markets are already partially open for competition. It is now – mid 1995 – quite common that customers are free to choose equipment like terminals, modems, and PBX's, in an open market with fairly open standards. Usually the markets for data communication and mobile telephony have also been opened for competition and customer choice. (cf. OECD 1995)

This is however as far as it goes in most countries. In the European Union and other liberalized parts of the world the telecommunications market opens for competition accounts only for 15-25% of the total markets in each country. In addition, a strict dividing line is upheld by legal monopoly protection of voice telephony services accounting for the lion-share, about 75-85%, of total telecommunication revenues, and the rest. Furthermore, the European commission has postponed any mandatory full liberalization to 1998 (cf. Caby & Steinfeld 1994).

Even if the US pioneered the liberalization of telecommunications, it is still only the market for long-distance telephony that is fully open for competition and customer choice, leaving a significant part of telecommunication revenues, as a crude estimation 40-60 percent, still being produced under conditions close to monopoly. New US legislation is however underway aiming at full liberalization, implying that most probably all telecommunication services will eventually be produced in free competition in the US (Business Week, 1994).

Sweden and New Zealand, having embarked on a "100 percent option" in the early 90s, thus constitutes interesting examples of more complete liberalization. These

two markets enable domestic as well as foreign companies to: (1) invest in their own infrastructure, (2) lease capacity for transmission from other vendors and (3) interconnect with competing or complementing network operators at their own choice. Sweden may also serve as a test market for foreign actors with more closed home markets.

In this paper we describe with numerous illustrations the recent developments of the Swedish telecommunications market. We also try to explore what this transformation consists of, developing and elaborating with a set of interrelated driving forces that are formalized into hypotheses. We ask ourselves: who can provide telecommunications services – the actors involved; how telecommunications services can be supplied – the activities involved; and with what inputs telecommunications services can be produced – the resources involved.

The theoretical concepts of market, industry and industrial network are used to characterize more or less the same object. Whereas a market connotes all the buyers/users of a specific product and the industry all the sellers/producers, the industrial network (a research tradition concentrating on changes and dynamics of firms and industries, see e.g., Johanson & Mattsson 1993) in contrast is focusing on the relationships between actors in a network. This implies inclusion of an extended set of actors – sellers, buyers and others when researching (i.e., an industrial network is not a market or an industry).

The transformation of Swedish telecommunications originates from the Swedish PTO, Telia, that until the mid 1980s provided most of the services in Sweden. Thereafter many other actors have appeared providing telecommunication services and operating telecommunication resources (see e.g., Helgesson 1994, Helgesson & Ioannidis 1994 and Söderlund & Vilgon 1992). Our research focus is thus not only the development of the telecommunications market and industry, but rather the wider industrial network producing telecommunications services (for examples of similar studies see: Håkansson 1987, Mattsson & Johanson 1992 and Lundgren 1995).

## **THE ESSENCE OF TRANSFORMATION**

Liberalization constitutes a widening of opportunity and choice for managers handling the transformation as well as an increased risk and uncertainty in the marketplace. In this section we present some central areas of change as well as affiliated empirical examples affecting the industrial networks.

### **Integration of technological systems**

Development in communications technology as well as other related technologies have made liberalization possible. Technology has also been a determining force in creating separate markets for various services and has had a decisive impact on how the industrial networks supplying different services have been organized. Rapid development and

absorption of new technology are causing integration of previously quite independent networks.

The Swedish mobile telephone system offers an interesting example. From a situation where basic fixed telephony totally dominated the market for telecommunication services – mobile telephony became a complement to regular basic services in Sweden during the 80s. The result was two relatively separate telecommunications systems, fixed and mobile networks. These two categories of systems were integrated to a low degree and the coordination between the systems that took place focused on handling intra-system traffic flows. In the 90s the two technological systems have gradually been further integrated to offer more seamless services (Kaplan 1995).

Another case in point is the cable-TV industry in Sweden. The prospect of using cable to create alternative access to households, has lured Singapore Telecom to acquire the leading cable-TV network in Stockholm – ‘‘StjärnTV Nätet’’ (Traffica Bulletin 1995). The alternative access established with users intensifies the competition for calling revenue and leads to an environment of multiple access, conceivably even wiping out the value of established end user access.

Using alternative infrastructure as a platform for delivering telecommunications services is turning actors only remotely related to telecommunications into operators. This is the case with Banverket, the state-owned manager of railroad tracks in Sweden as well as utilities, electricity and water companies owned by local government. By using existing pipes and tracks these companies have invested huge sums in fiber cable utilizing existing resources in management of infrastructure businesses (Banverket 1994).

Finally, there is integration between services and products at large. An important example is the cross-subsidizing of terminals to gain calling revenue (Business Week 1995). On the Swedish market for mobile telephony, Comviqs strategy has followed this line. Comviqs competitors have answered in kind and currently, both Telia Mobitel and Europolitan, Comviqs principal competitors are also trying to win over Comviqs existing customers, making the return on this type of investment uncertain. (Hultén & Mölleryd 1995 & DataVärlden 1995)

The integration between products and systems transforms the network by opening up for new combinations of actors to work jointly, pooling their resources to create new offerings or activities. As a consequence new complex interdependencies are introduced affecting the configuration of actors, activities and resources in the network.

### **Separation of logical and physical systems**

Due to digitalization and other technical advances many logical systems can coexist using the same underlying physical infrastructure. Lack of physical infrastructure is thus no longer a crucial entry barrier to operate a logical system, since capacity can be leased from other operators. As a consequence, controlling and managing a physical network does no

longer necessarily imply accrual of marginal revenue from end user utilization, creating new and more diverse cost structures among actors.

Several large Swedish multinationals like Ericsson, Volvo and ABB have also created their own logical or virtual private networks, in fact becoming operators in their own right. Control of PBXs, leased lines and creation of internal number plans has been some of the principal instruments for producing telecommunications services in-house. Closely related to this development has been the many computer companies on the Swedish market that have focused on data communication as an integral part of their services, especially when managing computer departments of other companies. (Kaplan & Kastberg 1994)

A potent development when it comes to separation of logical and physical networks is the Internet as well as other on-line services. Since Internet only uses a logical protocol and can ride virtually any communications technology without any corporate nexus controlling and providing the physical infrastructure for the traffic, the whole idea of a network operator is questioned. By using software from companies like VocalTech, the Internet may eventually take over telephony, facsimile and many other services, since it can always take advantage of the cheapest routes available. (The Economist 1995, DataVärlden 1995)

A prelude to this development and a hint of what is to come, is the computerized exchange that is operated by the SE-Bank, one of Sweden's leading banks. The exchange automatically route calls the cheapest way possible between two points. A related phenomenon, at least in the short run for incumbent operators are the call-back companies, profiting from price-arbitrage by using tariff inconsistencies. In Sweden, there has been about 30 entries. The most well known are Unicall that represents MTC of the US and Callback International that is backed up by Telegroup Inc.

A case of the separation is the creation of Unisource, which is a joint venture incorporating activities from the mothers: Telia, the SwissPTT, the DutchPTT and Spain's Telefonica and partly AT&T. This constellation has been assigned a marketing task on a pan-European level, without any significant infrastructure of its own, relying on its mother-organizations for distribution capability (Kaplan & Lundgren 1995).

The gradual dissolving of logical from physical systems heralds a potential market division and polarization between logical and physical infrastructure where competitiveness and industrial logic possibly are determined differently. Furthermore, the separation enables actors to work together with different partners and perform activities previously not carried out, and for resources to be created and managed differently - into new combinations.

### **Blurring of industrial boundaries**

The core product, transportation of digitized information, is close to a homogenous product which leads actors to differentiate. Telia like many other operators have increased investment in development of new services, trying to create more unique products. Telia has also announced that an integral part of its strategy, is to increase the value-added in its services. The problem is that even quite sophisticated services in potential areas for differentiation as function, quality, usability and service are relatively easily and rapidly copied. (Telia 1994 & 1995)

Actors have attempted to handle the squeeze in a number of ways. An important strategy has been finding partners both internationally and nationally. For instance, the Kinnivik Group has invested first in mobile telecommunications through Comviq, then moved to fixed communications by establishing Tele2. Kinnevik has also brought in Cable & Wireless with a large stake to get access to an international network. Furthermore, Kinnevik has invested heavily in media - TV, radio, and print - thereby gaining access to content. In this process Kinnevik has created the strongest independent group of companies engaged in Swedish telecommunications. (Kinnevik 1993, 1994)

Foreign entrants have most often chosen another road - niche-capability, which has been used by MFS that are concentrating on servicing the financial industry with end-to-end responsibility. In Sweden they have focused narrowly on Stockholm and its financial institutions (SvD 1995). France Telecommunication has pursued data communications almost solely in Sweden. BT Worldwide in Sweden has been courting large multinationals mostly, trying to utilize BT's international capability. These specialization attempts within telecommunications have however not proved especially successful as differentiation strategies (DataVärlden 1993).

In response to the fear that telecommunications are turning into a standardized low-tech commodity, the merging of computers and telecommunications with other industries (e.g., banking, retail trade or media), has been suggested as a solution to the perceived limits of differentiation. Many new products and services also depend on integration of content, processing and transportation. (ARC Associates 1995) Until now, most new ventures have been different media's finding new distribution channels - like the big newspapers becoming available on the Internet, in Sweden, e.g., DN & SvD (the two major morning newspapers in Stockholm).

Industries like financial services, retailing, computing, electronics, multimedia content, multimedia distribution and software writers are now adapting themselves to distribution via networks. Visa or Mastercard could easily be viewed as operators specialized in electronic payments. Microsoft is becoming more of an operator by adding gateways in Windows95 for easy access onto networks. Without any significant content of its own, with the important acceptance of content production by end users themselves,

it is however hard to identify what advantage operators have when it comes to production of content, when their competence is in distributing content. (The Economist 1995).

Resources are thus constantly revamped, redeployed and redesigned by actors to remain heterogeneous enough to be attractive in the more expanded networks. Actors are emerging trying to exploit perceived opportunities by mixing and creating new sets of activities establishing bridges to other technologies, industries and markets.

### **Changing and alternating roles**

The tasks of actors, activities and resources in the market are increasingly confused. An example of this development is the introduction of competing domestic voice services by Tele2 in Sweden. The company is to a large extent renting capacity from Telia, the Swedish PTO, while at the same time competing with Telia directly for the same end users. Tele2 has eventually been followed by a number of companies, basing their services to a large extent on Telia. In this case Telia gets alternating roles, both as an intermediary and a complete service provider working with end users, increasing the need for ever ongoing negotiations and bickering for third-party traffic agreements, which indicates the importance and needs for interorganisational coordination. Using the distribution capability of each other is most often a precondition for serve end users, something that Telia has had to experience when venturing to UK. In parallel with Tele2 in Sweden, Telia in the UK assumes the role of a challenger, relying on BT's underlying infrastructure. (Tele2 1994 & Traffica Bulletin 1995)

In Sweden, there has not only been a large number of actors – since 1988 the number of actors has increased sixfold from 38 to 237, but they have also been concentrating on some aspect of telecommunications, like fixed, mobile or only leased lines' operations, rather than attempting to becoming full operators. Furthermore, actors have become much more different in terms of turnover, number of employees and access to capital. As a consequence, being a clever and useful partner and a skillful negotiator with other actors can be a precondition to serve end users. In addition end users – companies or consumer's – with relative ease can choose to perform tasks in the networks themselves – insourcing – complicating and confusing roles even further. (SBC 1995, Patent och Registeringsverket 1995, Post & Telestyrelsen 1995)

Establishing what constitutes an actor, activity or resource is very much a matter of perspective and can when done bear much of arbitrariness. Actors can be suppliers, producers, wholesaler and retailers simultaneously and in consequence engages in assorting, matching, access creation, bulk breaking and other tasks in parallel. Accordingly, which actor that performs various tasks in networks very much varies with the role that an actor assumes in a particular situation, rather than from a structurally given position. Actors, being parts of a larger whole, repeatedly find themselves being inputs – resources and involuntary parts of activities supplied and marketed by other actors.

## INTERPRETATION OF THE TRANSFORMATION

Rapid integration of systems and products, the separation of logical and physical systems, blurring of industrial boundaries, changing and alternating roles are presented as the main aspects of the transformation in telecommunications. The combination of these aspects makes telecommunications different. The question of what market evolution can be expected is therefore an open question.

The competition is bound to intensify between conventional operators – but equally bound to affect and involve neighboring markets and technologies. This blurring and dissolvance in many dimensions make consolidation as the expected long term result after liberalization highly elusive. The notion of a structure and an eventual steady state cannot be taken for granted. Instead other theoretical interpretations are needed and in this section we depict what principal change processes that we believe the Swedish telecommunications market has been undergoing from a network perspective. The processes encompass a spectrum of processes affecting both effectiveness and efficiency.

### **From one offer to choices in abundance – Completion**

In the liberation process were positions are not yet entranced and opportunities are increased, companies as well as individual entrepreneurs are experimenting by trying to capture and create revenue by introducing new ventures through innovative resource combinations. Furthermore, positions that can be identified, but are not yet occupied are certain to receive attention by new or potential entrants. The search for still empty places or opportunities in the network will cause a drive for completion or enhanced effectiveness.

Hypothesis: transformation causes the total number of activities performed to increase.

With completion it is suggested that a liberalized market will undergo a process where actors are trying to create new businesses and ventures and offers by completing the offerings of existing competition by being different in one or several dimensions and thereby adding to the offered market variety. By completion, a process of “filling in the gaps” is suggested as the market tries to serve customers by increasing heterogeneity.

In the adjustment period following liberalization, a wave of attempts for completion can be discerned, many by altogether new actors. Some of these ventures will probably fail, permanently or temporary. There will be tasks in the market network that at some points will not be profitable, and therefore not performed by any actor at that time. These market failures may be viable later on depending on future technology, competition and regulation. There may also evolve considerable geographical differences reflecting the underlying differences in customers needs.

Furthermore, successful attempts of completion may in turn create new opportunities, since new gaps unintentionally are being created in the process as new networks also leave new opportunities waiting for actors use the "loose ends" as resources for combination of new activities. Whether the market as a whole eventually will experience failure to such an extent that its combined offerings that are better or than the pre-liberatization situation as compared to the situation before is not obvious. A fair assumption is that the market will be at least as complete after liberatization, and probably offer a larger variety of services.

### **From one type of actor to many types of actors – Specialization**

Closely related to completion is specialization. Completion predicts that the number of activities performed will increase while specialization specifies how these activities will be spread among individual actors. Actors will eventually find that they cannot serve all segments or sub markets as well as desired or needed. We can therefore expect that actors will prune their activities and concentrate their resources in order to gain sufficient competitiveness.

Hypothesis: transformation causes the variety of activities performed by individual actors to decrease.

By specialization a process of activity sorting is assumed were individual actors gradually will insource core and related activities and outsource non-related and remotely related activities to other actors. Not all companies will practice specialization. Specialization may be more naturally expected from the incumbent, but not necessarily so with new actors in the short and medium term. Small companies may perceive that they must engage in many different activities, since technology and markets change fast and they may therefore diversify at some stages in their development to reduce operative risks. Small companies can however eventually be expected to concentrate themselves to create and develop a market for their products. In addition, as in the case of Telia today, diversification may most probably come in a related product category, where the company can extend its operations through capitalization of existing knowledge or other existing resources.

The large variations in resource endowment: capital, knowledge and people in the actors represented in Sweden, also indicates that actors most probably will specialize to match their activities with their resources. We can also expect that countries that have deregulated early and/or more far-reaching may encounter companies that have progressed further in their specialization.



### **From one outcome to many outcomes – Clustering**

Specialization may not only come on an individual corporate level where we can expect activities performed by individual actors to become increasingly more homogenous, but also on an overall network level where clusters will emerge. These clusters will be governed by the collective action of the participating actors. When clustering actors position themselves not only towards their customers vertically, but also in relation to each other horizontally.

Hypothesis: transformation causes actors with complimentary resources to cluster themselves into groups performing complimentary activities.

It is furthermore suggested, that the monopoly is not only being replaced by a duopoly or oligopoly, but rather is the original market dissolving into a number of markets and that the singular market structure is being replaced by a multiple market structure. The logic of different sub markets may vary considerably and the result of liberalization may be very different.

Due to underlying variations in sub markets, the clusters will exhibit differences in growth rates, future prospects, choice of technologies and pricing. The norm will be temporariness, where new clusters can be expected to appear and disintegrate or disappear over time. One important factor is users, where different customer groups are demanding and getting more specifically designed services by groups of companies.

### **From one on its own to many in concert – Integration**

Liberalization yields an increasing number of formally independent and specialized actors. In order for them to be able to offer workable and desirable products to their customers, actors will have to learn to cooperate, leading to increasingly interdependent actors. There is an accentuated need for integration between actors in core telecommunications as well as other related industries regarding, design, purchasing, control and maintenance. The more specialized actors in the industry become the more they have to coordinate and work together.

Hypothesis: transformation increases the number of exchange relationships within clusters of actors.

The increased level of integration can be regarded as an indication of closer operational interdependence within clusters. Integration comes in many spheres: in technologies – computers and telecommunications; integration of systems like mobile and fixed networks; in industries – media, computers and telecommunications. We can also expect

that countries that have deregulated early and/or more far-reaching have experienced a larger degree of integration between their actors in the relevant clusters.

Following from the increased integration there is a great complexity. This complexity is there because of the sheer number of actors positioning themselves and trying to create unique capabilities. Using and capitalizing on each other to produce their services, extensive webs of actors are being created engaging in alliances, agreements, licensees, production and cash flow generation.

### **EFFICIENCY VERSUS EFFECTIVENESS**

Through completion, specialization, clustering and integration new industrial networks are emerging as a response to liberalization, i.e., the transformation of the networks. These processes opens up a number of areas for further inquiry. One aspect of the transformation is to what extent these processes enhance efficiency and effectiveness.

Individual actors will strive for efficiency to stay competitive, trying to make the most of their own resources as well as becoming attractive partners in networks. Since the transformation will be promoting and propagating a continuous unforgiving market adjustment process, differences in efficiency will weed out relatively inefficient actors through successive optimization processes. Liberalization was motivated by the authorities to enhance a more efficient use of resources. Countries that have entered liberalization early and more far-reaching have also achieved greater efficiency.

When it comes to effectiveness there is more uncertainty to what the transformation may result in. Considerable resources are being engaged and actors enter and exit activities in short time spans, laboring and experimenting with new technologies and systems, most of them sourced from other countries. There are however few indications that the actors have become more effective in combining resources to create new versatile activities.

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