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Netting the information infrastructure of Stockholm

An idea travels throughout the world

by

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Abstract

This paper illustrates how the idea of a national information infrastructure travels through the world. Once the idea has traveled from the United States to Europe and to Sweden it has been translated and localized into a Stockholm context. Based on interviews with city managers, observations at a panel debate, and on searches on the Internet, the study reconstructs the netting of the information infrastructure in Stockholm (IT net).

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Introduction

City managers seem to share an idea that there are widely accepted models for how to manage events in big cities. That is true for international sport events like the Olympics or the World Cup taking place in cities, but also for cultural events like the yearly cultural capital in Europe. These events are passed on from one city to another, from one time to another. As much as they differ from place to place and from time to time, they have basic features in common. They bring hope and prosperity to city inhabitants, they give regional business some good years, and they give city managers a way to profile and market their cities.

During the late 1980s, city managers in several cities have tried to market their city with an partial identity[2] related to information technology; i.e. Osaka as a *city of intelligence*, Barcelona as a *city of telematics*, Amsterdam as a *city of information* and Manchester as a *wired city* (Hepworth, 1990:550ff). These attempts mirror the emergence of a space of flows which replaces the notion of the space of places. It poses a challenge for cities to construct new productive infrastructures, thereby turning cities and regions into critical agents of economic development by introducing informational city concepts like the *technopoles* or *technoburbs* (Fishman, 1987; Castells, 1989; Castells and Hall, 1994). Thus, marketing partial identities of techno-dreams is one way of marketing a city.

These tendencies are understandable; cities increasingly compete for attention on the global scene. Stockholm is an example for many different ways of marketing a city. City managers in Stockholm are marketing Stockholm as the city of culture (Porsander, 1998; Porsander and Pipan, 1998), as a most advanced environmental city (Adolfsson, 1999), or as an IT city (Dobers, 1998). The official web site of the City of Stockholm has a page which tells us about the IT city Stockholm and refers to three additional web sites where we are served more arguments that “Stockholm is an IT city”. These references have in common that they are marketing Stockholm; strengthening the profile of Stockholm as the leading IT city in the world, showing that Stockholm is on the edge of modern

[2] An identity related to information technology is of course one among several identities of a city. Depending on what kind of city managers is busy marketing the city, and depending on who is looking at the city, multiple identies of a city will exist. Thus, I choose to talk about partial identity.

information infrastructure, and stimulating the development of information technology in Sweden.

Web page: Official site of the City of Stockholm

The IT city Stockholm

Stockholm is an IT city[3]

The Bangemann Challenge
Stockholm City challenges world cities to become best in IT.
Web site: http://www.challenge.stockholm.se/

Stokab, Stockholm city cable company
Stockholm has one of the world's more far-reaching nets based on fibre optics.
Web site: http://www.stokab.se/

The City of Stockholm Development and Promotion office (SDP)
Tells you more about the IT conditions in Stockholm.
Web site: http://www.sml.stockholm.se/

Thus, city managers increasingly work for marketing their cities in particular ways to attract inward business, create employment, and to make the city worthwhile living in. Not seldom, policies from one city or country are borrowed and translated into local context in other cities or countries. This is what happens in Stockholm where the idea of an information infrastructure has been borrowed from countries with far-reaching plans for national or even global information infrastructures.

Aim of this paper is to illustrate how the idea of a national information infrastructure has been appearing in different places and in different times. This idea has arrived in Stockholm and been translated into a local model after it has been formulated in the United States and re-formulated in the European Council. However, once the local version of information infrastructures in Stockholm is submitted back to an international audience, the model does not easily travel back to the world.

In the next part of the paper I present ideas formulated in the United States, in Europe and eventually in Sweden. I show how these ideas take root in

[3] The web page on May 13, 1999: http://www.stockholm.se/ingangar/it%2Dstad.htm, my translation.

Stockholm as *The Stokab Model*. Observations from a panel debate illustrate the views of different actors and how the are trying to credit or discredit this model. The paper ends with the observation of attempts to bring *The Stokab Model* back to the world.

International ideas of the information infrastructure[4]

> *"Do you think me a learned, well-read man?"*
> *"Certainly," replied Zi-gong, "Aren't you?"*
> *"Not at all," said Confucius. "I have simply*
> *grasped one thread which links up the rest."*[5]

United States take on the lead

In their presidential campaign of 1992, Clinton and Gore emphasized how important it is to construct a national information infrastructure enabling a strategy for enhanced economic growth:

> "In the new economy, infrastructure means information as well as transportation. More than half the US workforce is employed in information-intense industries, yet we have no national strategy to create a national information network. Just as the interstate highway system in the 1950s spurred two decades of economic growth, we need a door-to-door fibre optics system by the year 2015 to link every home, every lab, every classroom, every business in America." [6]

Once the Clinton administration had won the election they initiated *The National Information Infrastructure. Agenda for Action*, which in September 1993 stated the goal of the national information infrastructure (NII):

> "A major goal of the NII is to give our citizens access to a broad range of information and information services. Using innovative telecommunications and information

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4 This description, if not stated more precisely, relies on mainly two sources (Leer, 1996:22-29; Ilshammar and Larsmo, 1997:27-43).

5 Recounted in Sima Qian (145-ca. 89 BC), "Confucius," in Hu Shi, *The Development of Logical Methods in Ancient China, Shanghai*: Oriental Book Company, 1922, as quoted in (Castells, 1996:1).

6 Bill Clinton campaign speech on "The Economy", held at Wharton School of Business, University of Pennsylvania, Philadelphia, on 16 April, 1992 (Leer, 1996:24).

> technologies, the NII–through a partnership of business, labour, academia, consumers, and all levels of government–will help the United States achieve a broad range of economic and social goals."[7]

Although the Clinton administration also took the initiative for policy discussions on the *global* information infrastructure, the inspiration to the American ideas came from Singapore. In the spring of 1992, the little South East Asian country announced its national strategy to convert Singapore into an information-oriented society (*Intelligent Island*) through a complete information infrastructure by the year 2000.[8] It seems as if Europe is lagging behind the competitive dyad of United States and Asia. But we will se that Europe soon was capable to respond to their ideas of a national network for information flows.

European based response

By the end of 1993, the European Council accepted the *White Paper on Growth, Competitiveness and Employment* prepared by the European Commission.[9] Areas of importance were to enhance the industrial and technological performance and to stimulate the use of information technologies through strategic projects on a European basis. To follow up the *White Paper* the European Council initiated two task forces. EU Commissioner Bangemann chaired one. His task force should draft an action plan for how to realize the potential of the global information society in Europe.[10] The Bangemann task force presented their report on specific steps to be taken into account by the European Community and its member states for the information infrastructure at the EU summit in Corfu, Greece, on 24-25 June 1994.[11]

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7 Larry Irving, the head of the National Telecommunications and Information Administration (US Department of Commerce) mentioned this goal at a speech (*Constructing the National Information Infrastructure. Ensuring that All Americans Get Connected*) at the Vermont Telecommunications Forum, Winooski Park, Vermont, 20 March 1995 (Leer, 1996:24).

8 The report published in the spring of 1992 by the government in Singapore was called: *Information Technology 2000. A Vision of an Intelligent Island* (Leer, 1996:28; Ilshammar and Larsmo, 1997:29).

9 Commission of the European Communities. *White Paper on Growth, Competitiveness, and Employment. The Challenges and Ways Forward into the 21st Century*, 5 December, 1993 (Leer, 1996:26-28).

10 Thus, the scope of the European response was somewhat different; the United States lead initiative took on a global information infrastructure, whereas the European inititative focused on the global information society.

11 EU Commissioner Dr. Martin Bangemann chaired the High-Level Group on the Information Society and presented the following report to the European Council on its meeting on 24-25

One urge to the European Union was to have faith in market mechanisms in order to break with the past.

> "As requested in the Council's mandate, we advocate an Action Plan based on specific initiatives involving partnerships linking public and private sectors. Their objective is to stimulate markets so that they can rapidly attain critical mass.
>
> In this sector, private investment will be the driving force. Monopolistic, anticompetitive environments are the real roadblocks to such involvement. The situation here is completely different from that of other infrastructure investments where public funds are still crucial, such as transport.
>
> This sector is in rapid evolution. The market will drive, it will decide winners and losers. Given the power and pervasiveness of the technology, this market is global.
>
> The prime task of government is to safeguard competitive forces and ensure a strong and lasting political welcome for the information society, so that demand-pull can finance growth, here as elsewhere.
>
> (…)
>
> It is possible to end monopoly. In future, all licensed public operators should assume their share of public service respnsibilities (e.g. universal service obligation and the provision of equal access to networks and services)." (Bangemann et al, 1994:8 and 12)

Member states of the European Union quickly took the so-called Bangemann Report as a point of reference when national ideas on information infrastructure and information society were formulated. Different elements of report were translated and adapted to local contexts. However, city managers of one new member of the European Union took particular advantage of the Bangemann Report. As a distinguished guest at the opening of the Stockholm EU office in Brussels in the late 1994, Bangemann was asked by city managers of Stockholm if they could not "borrow" his name for a project; a project, I might add, that were to spread the Stockholm version of an information infrastructure. Let me tell you about the project!

Sweden. A late forerunner?

Upon the Swedish membership in the EU Stockholm city managers decided to have a presence in the European context and to open an office in Brussels. The opening of the office was at the same time an opportunity to spread an idea. The mayor of Stockholm, Mats Hulth, seized city managers from cities in Europe with

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June 1994 in Corfu: *Europe and the global information society. Recommendations to the European Council.*

more than 400,000 inhabitants and challenged them in what was called The Bangemann Challenge. The challenge was to be best in using information technology in a variety of application fields. This is how Mats Hulth, the mayor of the City of Stockholm, and Jörgen Kleist, the project leader of the challenge, explained The Bangemann Challenge:

> ”Europe’s ability to incorporate and utilize the opportunities offered by the new information technology is significant to the development of our future prosperity. It is within the IT-industry that a large number of job opportunities must be created to keep pace with the disappearance of old workplaces. This is the background and basis for the City of Stockholm initiating The Bangemann Challenge. Through this challenge we hope to generate increased knowledge about all the good examples of IT-utilization that can be found all over Europe. We would also like to contribute to the expansion of networks created within the IT-field, both between politicians and civil servants as well as between the public and private sectors.
>
> (…)
>
> There are, however, reasons to point out that the competition in itself is not the central focus of The Bangemann Challenge. The significance of the challenge is in the underlying objective, to increase the exchange of experience in the IT-field within Europe and as a result advance IT-development in our part of the world. (Stockholm City, 1996:3)

From an initial project entry of 6 cities, the challenge grew to include more than 100 projects from 25 cities. One Stockholm project among several entering the Bangemann challenge was the fibre optic cable company called Stokab. By founding Stokab, the City of Stockholm and the Stockholm County Council created a window of opportunities to have their own city information infrastructure. Thus, the idea of a national information infrastructure as formulated in the United States has traveled and found spokespersons in Sweden. The IT net has come to the City of Stockholm.

NII find spokespersons in Sweden. The IT Net in Stockholm

Deregulation of the Swedish telecom market in 1993

Before introducing the Stokab entry to the Bangemann Challenge we need some contextualizing background information to the company's founding. In the late 1980s, deregulation of formerly monopolized markets was suggested to be the most important factor for the development of infrasystems of the communication's sector of tomorrow (Brooks, 1988:249). In 1993, the Swedish parliament decided on a new telecom act. This was an important step towards increased competition in the markets of telecommunication and computer communication (Reg.Prop.1992/93:200, 1992). Deregulation of the Swedish telecom market started and Stockholm became a test market for international suppliers of telecom services, testing their services before the expected deregulation in the European Union by 1998. City managers were serious about the deregulation and there were thoughts in the public sector that information technology could act as a driving force for the rest of the society:

> "The effectivity and quality in the public sector is of considerable importance to the welfare conditions in society. It is also crucial for the value creation in the private sector that the public sector works well. The use of information technology in the public sector is not only important by itself, but it can also serve as a driving force—a locomotive—for increased positive use of information technology in the rest of society." (Swedish Agency of Administrative Development, 1993:10)

Prior to the deregulation, Telia (its former name was Telephone Agency {Televerket}) had monopoly in the construction and maintenance of telecom services in Sweden. High prices on telecom services in urban areas financed the unprofitable provision of telecom services in non-urban areas. Thus, the telecom market in Sweden has changed since the early 1990s. Competitors to the Telephone Agency appeared offering low prices of telecom services. These companies focused their efforts in urban areas and avoided costly investments in non-urban areas. The Telephone Agency found that their pricing differentiation did not hold since, in the beginning, competitors could win over customers in urban areas when they also

did not invest in non-urban areas. However, it suffices to go back to the beginning of this century to find fierce competition on the telecom market in Stockholm. Before the turn of the century, the telecom market in the capital of Sweden was dominated by the Stockholm General Telephony {Stockholm Allmänna Telefonaktiebolag}, being strong in the region of Stockholm, and the Telegraph Administration {Telegrafverket} serving customers on a national basis. During decades they competed on the Stockholm telecom market. In 1918, the Telegraph Administration bought Stockholm General Telephony and by that gained a monopoly situation in Stockholm that was passed on to the Telephone Agency and eventually to Telia (Helgesson, 1998; Helgesson, 1999).

The deregulation of the telecom market in Sweden has shattered the well established idea of who is responsible for the infrastructure of information flows. And this is where the company of Stokab comes onto the stage and intends to change the scene.

Stokab – The Stockholm cable company

> "As a result of early liberal legislation, the City of Stockholm started to install an extensive fibre-optic network via Stokab in order to stimulate multiple investments and innovative new telecommunications and IT services in the Stockholm region. Since Stokab offers the market the fibre-optic infrastructure only—dark fibre—and leaves provision of services and the development of new services development to the market, Stokab provides a level playing field for all market players."[12]

Owned to 91 per cent by the City of Stockholm and to 9 per cent by the Stockholm County Council {Stockholms länsstyrelse}, Stokab inherited infrastructure from the county council, including 450 kilometers of channels to be filled up with fibre optics. One idea for founding Stokab was to establish an alternative information infrastructure to Telia's dominant infrastructure. This would lead to rate-lowering competition and attracting new IT companies to the region including clean, high paid, information based businesses. Also, lessons were learned from the early liberalization of the telecom markets in the United Kingdom, when the streets of London were dug up several times of different telecom companies.[13] Having this in

12 http://www.stokab.se/english/about/formation.html

13 Please also see http://www.americasnetwork.com/issues/98issues/981001_edge.html and http://www.swedtel.telia.se/Ireland/stokab.htm

mind it was no surprise that Stokab entered the Bangemann Challenge with their fibre optics project:

> ”In 1996, Stokab, a company owned by the City of Stockholm, will extensively expand the city's fibre optic network. The purpose of this effort is to ensure that every city block, most suburban centres and most industrial complexes in the Stockholm area have access to the fibre optic network before the end of 1996. The unique aspect of the Stockholm approach is that all operators (telecom, cable-TV and cellular telephony) as well as end-users can have their private fibres out of the Stokab fibre cables. Sharing the cables also means sharing the costs, for everybody's benefit. In this way, computer communication will become faster and cheaper, access to the Internet will be facilitated, and video communications such as TV on Demand will become more widely available.
>
> By using the underground train system and other existing underground supply systems, the network can be expanded at relatively low cost, without its causing detrimental effects on the environment. The very fact that the City of Stockholm has assumed responsibility for the network’s infrastructure has set the stage for a level playing field and a healthy competition between the operators.” (Stockholm City, 1996:33)

Despite providing an information infrastructure free to anybody to lease, Stokab’s fibre optics project was not awarded in this round of The Bangemann Challenge. However, the CEO of Stokab is very popular and an often seen speaker at international conferences on information infrastructures and telecom services. I had the opportunity to observe him in one of 9 panel debates taking place at a conference on IT issues in Sweden in May 1997. All debates have been taped and transcribed which leaves me with very good accounts of what was said. One of the debates was whether municipalities and county councils should engage in infrastructure for telecommunication and information flows.

Infrastructure for telecommunication and information flows

The current presenter has been talking for a few minutes and has just put on a slide on the projector.

> ”I am sorry that the slide is in English. The first part of the slide reflects what the Gartner Group said already in 1991. Telecommunications is the crucial factor for the future of Europe when the region competes with Asia and the United States, and the situation in Europe did not look good at that time. Let be that Sweden was in a little better condition. The second part of the slide shows something that the City of Stockholm has taught me and which they follow very closely, and that is a study done by a company called Healey and Baker. They ask large companies “What is it that attracts business? In your city, in your capital?”. Companies in 30 or more European capitals participate. And the companies respond: The first condition is: ”Closeness to

> the market". There I have learnt that Stockholm does not have a good position. Sweden is a little country in the outskirts of Europe. The second condition is: "Accessibility to international transportation." There we have nothing. The third condition for cities to attract business is: "Telecommunication". And that is really interesting, since telecommunication attracts business to Stockholm, and not to Hamburg; to certain regions in a country and not to others. You can understand how important this is to municipalities, respectfully so. Given these conditions you can ask, "Should you build your own channels for telecommunications?". I have understood that this is what happened in Stockholm, and that seems quite right, that you don't allow all operators to come to Stockholm and dig in the streets." (*panel debate 2B*: page 14).

It is late afternoon and for all day I have been to the conference *IT in Sweden 97*. This is the first day of a two day conference appraising the convergence between telecommunications and computers in Sweden. The citation stems from the last of six formal small introductions to the panel debate named *Infrastructure for telecommunication. New task for municipalities and county councils?* This panel debate is the last one for the day. It is dark in the large room and only the panel floor is lit.

Now talking is Peter Medlund, a director from the Swedish Agency for Administrative Development {Statskontoret}. This agency has several tasks, among which Medlund at this conference is the spokesperson of the deregulation and outsourcing of public service activities, electronic infrastructure for public administration and IT supported modernization of public administration. Prior to him were presentations from all-men representatives of three telecom service providers (Telia PubliCom, Metropolitan Fibre Systems and Global One), and from Stokab and the Swedish Association of Local Authorities {Kommunförbundet}. They have all touched on issues regarding information infrastructure and would soon be moderated by a journalist from *Computer Sweden*. Before we go to some of the prior presentations let us reside in what the recent citation brings into the panel debate and into the unlit room.

By referring to the Gartner Group and one of their studies from 1991, Medlund underlines how important it is for cities to work and stay tuned with telecommunications. After all, this is what the conference is about. And he does so by borrowing from the authority of the Gartner Group. According to the Gartner Group, they are

Web page: The Gartner Group

> "... the world's leading authority on cutting-edge information technology. Gartner Group provides you with cutting-edge advice and targeted insights to support competitive decision making across the IT spectrum. Our unparalleled expertise supports you with research, analysis, consulting, measurement, decision evaluation, and product and vendor selection."[14]

So if the Gartner Group stated in 1991 that telecommunication is the crucial factor for the future of Europe, we better believe them! Also, by bringing in a reference to Healey & Baker, we understand that city managers use reports from private consultancies to legitimize certain actions. Healey & Baker is a company that operates a Europe-wide research service, offering clients support with market appraisal, portfolio analysis and information. By assessing the appeal of markets for relocation or for network expansion or contraction, the market appraisals of Healey & Baker give investors, developers and companies important information on where to locate their business.[15] (This is quite similar an activity that Stockholm has organized in form of The City of Stockholm Development and Promotion office {Stockholms Mark och Lokaliseringsbolag}). But market appraisals also signal how city managers should market their cities.

These references to reports from other organizations perform several things. On the one hand, they give authority and legitimacy to the current presentation. Medlund mobilizes resources from outside the presentation by bringing in friends that give strength to his arguments. Thus, references make Medlund appear stronger than he and his arguments by themselves might appear. Borrowing a phrase from Bruno Latour (1987:31); Mr. Anybody has become Mr. Manybodies! On the other hand, by themselves, the reports do not perform anything but

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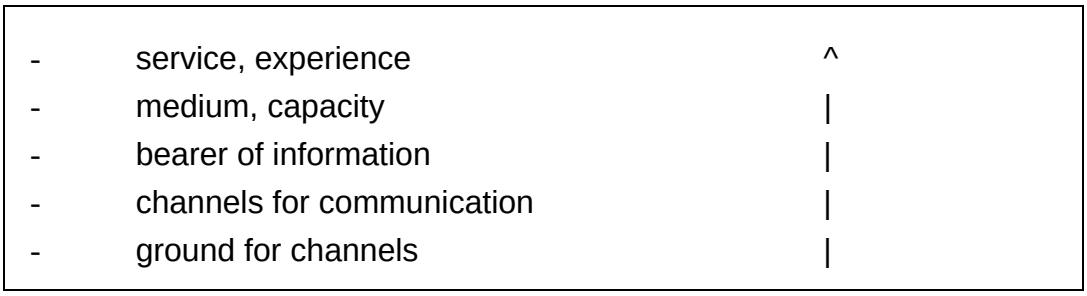
14 Gartner Group was also named in an interview with the vice president of the IT department in Stockholm. He said that the web page of the Gartner Group was crucial for being updated on IT issues. (http://gartner4.gartnerweb.com/public/static/aboutgg/aboutgg.html)

15 According to one web page: "H&B is one of the world's leading commercial real estate consultants. Founded in London in 1820, the firm is now represented worldwide. Our clients vary from local entrepreneurs to large multinational corporations, from both private and public sectors. We add value to a client's business through the identification, acquisition, management, organisation and disposal of property assests." (Compare at: http://www.healey-baker.com/research.htm)

produce paper. However, when city managers like Medlund bring them into a new context by referring to them, these reports gain in degrees of reality since they are referred to. The point is; the fate of the reports are in the hands of others. It is not when reports like those from the Gartner Group or from Healey & Baker are valuable that they are used in presentations and referred to; it is when these reports are used in presentations and referred to that they are becoming valuable (Latour, 1987).

For now, let's go back to the conference in Stockholm. First out at the panel debate is Bruno Forsén, technical director at Telia PubliCom, a suborganization of Telia that works with the public sector. He starts by showing the following slide:

Slide: All levels have to be taken into account



By presenting the slide, Forsén shows the areas in which Telia PubliCom is working. He continues:

> "It is actually very basic. There are many sophisticated ways for categorizing the field, but you need ground to provide for channels; you need channels for bearers of light or electricity; you need the capacity to transport ones and zeros, and on top of all this, you need the service and the experience. And Telia can give you all of the above and wants to discuss cooperation, and we do cooperate. That's nothing strange about that." (*panel debate 2B*: page 2).

Telia, being the only telecom actor in Sweden before the deregulation of the Swedish telecom market in 1993, has built up knowledge covering all levels of telecom infrastructure and service provision. The company is used to cooperation and running operations on all levels. Now the company increasingly finds itself in competition with others.

Soon, according to the program, Forsén will turn over the floor to the CEO of Stokab. However, he continues to describe pilot projects going on in Stockholm,

Göteborg, and Malmö, the major cities in Sweden. They facilitate the use of regular telephone lines for television and a fast access to the Internet. When asked by the moderator whether Telia PubliCom plans to construct a computer net in cities with less than 2,000 inhabitants, just as they have done with the net for telecommunications, Forsén answers:

> ”In those areas, we build in accordance with the market conditions. (…) We have had a responsibility for constructing and maintaining the regular telecommunication’s net in the country side, but that is not valid for the computer net.” (*panel debate* 2B, page 3-4)

Eventually, it is time for Anders Comstedt, the CEO of Stokab, to take over the microphone. You can tell that he has been presenting his ideas and those of his company often before. Not surprisingly, he starts his presentation by showing the policy of Stokab:

Slide: The policy of Stokab

- to coordinate and enhance the tele use of the existing, partly secret, channels and cables of the city
- to ensure more access to reserves in the city net
- to stimulate the telecom market by supplying transportation capacity cheeper than for others to construct cable capacity on their own
- to reduce the digging by new telecom service providers
- to provide an open fibre infrastructure for all telecom service providers
- for a few per cent of the telecom market we get innovation, competition and diversity on the rest
- the net construction is driven by company demand; starting from the middle and circling out
- sales at 50 million kronors a year with strong investment rates

The next slide is actually in English which signals that he has held presentations to English speaking audiences before. Comstedt says that one reason for cities like Stockholm to invest in their own information infrastructure is the short pay back time of sometimes less than one year. Also, the costs can be reduced considerably for telecommunication between the City’s different administrations. (His slide

covers some basic points and we start recognizing certain areas of what Healey & Baker also have put forward according to Medlund)

Slide: Why do cities become players?

Day 1:	quick money in cables
Day 2:	to lower own phone bill
Day 3:	support local industry growth
Day 4:	quality of life issues

The question emerges of what the mix should be of providing information infrastructure and value added services. Is it better to provide a package including the basic infrastructure of the fibre optics and the value added services (which, I believe, is what Telia does), or is it better to provide only the infrastructure and its maintenance and let the market provide the services (which, I believe, is what Stokab does)? In this argument, Telia PubliCom (and Forsén) is a spokesperson of services on all levels, and Stokab (Comstedt) is a spokesperson of competition.

Comstedt also uses a slide of Forsén when he makes clear the characteristics of Stokab's business:

> ”Our task is to construct the lowest level for all those providers of telecom services that do not want to send signals through the cables that belong to the old monolith of Telia. (…) The development is very company driven. We see that we live in a symbiosys with the service providers. But, if nobody wants to lease our fibres, we will of course not build any fibres either.” (*panel debate* 2B, page 6)

I don't think I was the only one in the audience to hear this utterance as provocative: “monolith Telia”. As if we were right back in the fight between David alias Stokab and Goliath alias Telia PubliCom, and where the market seems to be in favor of the former, and now the winner is picking on the loser! The Market seems to have drilled its spokespersons well, and poor Forsén finds himself pushed in the corner, left with only a few friends close to Telia PubliCom.

But Forsén is given unexpected support. Another speaker of the panel, a representative from the commercial Metropolitan Fibre Systems (MFS), says they were starting out working like Stokab, meaning they were providing infrastructure only, but soon realized that the profit is higher up on the value chain.

> ”The activities of MFS actually started as a daughter to a construction company in the USA then laying the channels for providers of long and short distance telecommunications in the USA. There we saw that instead of laying fibres for others, you could lay down your own fibre and lease it to service providers of telecommunication. And that is how it started. (...) We take the signals from our clients all the way from start to goal. (…) It is very important to us to control the infrastructure all through the net.” (*panel debate* 2B, page 10f)

It seems that the motive for organizations operating on higher value levels is to make profit and have control over their net. MFS, for instance, is known to provide financial centers world wide with their own fibre optic network, from computer to computer. Given this it seems quite honorable of Stokab to not engage in profitable activities, which also is supported by the following excerpt from an interview with a high employee of Stokab. When asking what Stokab does, I got the answer:

> ”If I say that we construct fibre optic nets we do so with the so called dark fibre. And that means that we only roll out the cables in the streets. We do not provide any value enhancing services, that is for the large providers to do. The idea is not to become a service provider and to compete with our customers, but to supply them with roads and let them do the driving on the roads.” {I ask:} “But, is this not where the money can be made?” {Answer:}”Yes, but we are not here to make money, but to enhance for others to make money. I mean, the basic idea for our operations is not to supply the city with more money, but to enhance the employment in the city. So, if it is only money you’re looking for, then you should climb up the value chain, but that’s not our idea.” (*I-01*, page 1)

Stokab, although showing profit in 1998, seems to be a non-profit company that wants to create a market for information flows through constructing the information infrastructure in Stockholm. The ones in favor of the information infrastructure seek a driving force in the demands of the market. In the era of fast information exchange, they see the building of paradise as represented in the infrastructure of the market. That is why it seems reasonable for city managers of the City of Stockholm, with reference to the market, to invest tax payers’ money in a city owned company and in constructing a net of information flows.

Now. Stockholm has formulated its own strategy for constructing an information infrastructure without providing service. By establishing Stokab, a certain model of constructing an IT net in Stockholm gains in degrees of reality. It also seems that many municipalities in Sweden has borrowed the policy, but leaving out services. The model obviously works in Stockholm and in some other Swedish cities, but could this model also be possible outside of Sweden?

Bringing *The Stokab Model* to the world

Leaving the conference and coming back to my office, another surprising voice in the debate springs to me after I had searched the Internet for "Stokab". One of the hits I got stems from a discussion list (*Ausplan*). May 1, 1997, only a few days prior to the conference in Stockholm mentioned above, an evidently Swedish researcher at AT&T writes a note on *The Stokab Model*:

Web page: The Ausplan discussion list[16]

> "Ausplan list members,
>
> Has anyone in Austin studied the Swedish *Stokab model*, pioneered in Stockholm, where the municipal government provides "dark fibre"—but NO services—to all comers at cost based prices? The purpose is to boost economic growth and quality of life, by opening the local loop to *real* competition—with rapid deployment of broadband to both business and residential consumers. ("Life starts at 2 mb/s" is their slogan.)
>
> Fibre deployment began in 1994, and today the model seem to be working. At the inception most commercial actors were skeptical, but now *all* of Stockholm's competitive telco/Internet service providers rely on Stokab as a trusted strategic partner. Stokab's success has caught the eyes of other cities. Of Sweden's 288 municipalities, 170 say they are adopting the model.
>
> Now my question is, could something similar happen in the US?
>
> Anders Fernstedt"

Fernstedt gets two brief answers saying that *The Stokab Model* would not be appropriate and legal according to US practice and legislation:

Web page: The Ausplan discussion list

> "I don't think ownership of telecommunications infrastructure by municipal government is an appropriate model for US cities".[17]
>
> "It could happen in places like Silicon Valley, Seattle or New York City. In Texas, however, municipalities are forbidden from doing so by PURA '95, a.k.a. HB2128."[18]

At the first sight, there seem to be no spokespersons outside of the Swedish realm who are interested in *The Stokab Model*!

16 http://www.main.org/Archives/ausplan/0006.html
17 http://www.main.org/Archives/ausplan/0009.html
18 http://www.main.org/Archives/ausplan/0010.html

Finally, the interest of two spokespersons!

Stop. Let us reside here for a moment. Coming this far in the paper, almost to the end, we have witnessed how the idea of a national information infrastructure as formulated in the United States traveled to Europe and entered the political field of the European Union and its member states. The Bangemann Report brought attention to actions necessary to enhance the information society in Europe. The soul of this report was picked up and brought into a Stockholm context where the Bangemann Challenge was formulated. As we have seen on the official web site of the City of Stockholm, the Bangemann Challenge is one activity of the IT city of Stockholm. Another activity is the construction of the information net through Stokab. The latter is a project of pride to city managers in Stockholm and it entered the Bangemann Challenge in Europe. Thereby, *The Stokab Model* of a city-owned information net was brought back to Europe.

Meanwhile, in January 1997, the Bangemann Challenge has been relaunched on a world wide basis as the Global Challenge, by which the mayor of Stockholm and other city managers throughout Europe challenge the rest of the world in the field of IT. The Bangemann Challenge has become increasingly known and the Global Challenge brings some of the world interest to Stockholm concerning issues in information technology and information society. The award ceremony will take place on the days of June 10-11, 1999 in Stockholm. The mayor of Stockholm at the time of launching the Global Challenge, Mats Hulth, wrote a piece for the start:

> "As the European-based Bangemann Challenge draws to a close we move on with the Global Challenge, a logical development in light of all the recognition the Bangemann Challenge has received. Four houndred specially invited guests attended the awards ceremony, which was broadcast live on the Internet.
>
> In connection with the awards ceremony {in January 1997} a Mayor's Summit was held with representatives from participating cities and regions. The summit exemplifies one of the many effects the Bangemann Challenge have had, namely, a closer political collaboration in the IT field. The increased collaboration that stretches across national borders can contribute to the acceleration of technological development, and can be an instrument for improving living conditions for all Europeans.
>
> With a continuation in the Global Challenge we in Europe will be able to compare our work with the best that North America and Asia have to offer in the field of IT. We should take advantage of this opportunity. Undoubtedly there is much we can learn from others, and I also believe that other parts of the world can learn from the work being done in Europe.
>
> I would like to take this opportunity to congratulate the people involved in the winning Bangemann projects. It is equally important to point out that in addition to

> the winning projects there were many other entries with a high standard. The people involved in these projects deserve our praise too. It is the sum of all the pioneering work being done in the field of IT around Europe that will ultimately have a decisive impact. How this will affect the future depends on our ability to gain knowledge from our experiences, and our ability to share knowledge with others."[19]

If the Bangemann Challenge or the Global Challenge has helped *The Stokab Model* travel to the world is beyond the scope of this paper. The paper is merely illustrating how certain ideas of information infrastructures have developed in different times and in different places. Through a discussion list *The Stokab Model* of how to provide society with information infrastructures traveled back to the United States. Once it was presented to a discussion list, fragile and vulnerable at first, it did not attract interest enough to keep it alive. Fernstedt, by the question on the Ausplan discussion list, specifically asked list members in May 1997 if the model would work in a United States setting. It would take until mid 1998 that the model of how Stockholm constructs information infrastructure gained more international spokespersons and when other humans became interested.

David Isenberg, author of the article *Rise of the Stupid Network* (Isenberg, date unknown), has spurred much attention in the United States. He has also written an article comparing two models for providing information infrastructures in the cities of Stockholm and Glasgow (Isenberg, 1998). The former city zero in their actions on constructing the information infrastructure only, leaving out the provision of services. The latter city operates the information infrastructure and offers retail telecom services. Isenberg is in favor of the Stockholm way of providing infrastructure since it seems more trustworthy and "gains strength from the magic hand of open competition at every level above dark fibre" (Isenberg, 1998:2). Interestingly, and here is where Isenberg criticizes the Telecom Act of 1996 and the many anti-city ownership laws passed recently, none of the above could be legal in the United States.

Even Telia, a company that has been very much the target of Stokab's efforts, has published an article on how information infrastructure is provided for in Stockholm (Telia, 1998-URL). In comparison with the newly liberalized telecom

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19 http://www.stockholm.se/bm/awards/dokument/introduction.html. According to my print out, I found this web page on February 18, 1999 at 3.08 pm. In my attempt to reassure that links used in this paper are still working in June 1999, I found that this Internet address is no more existing.

market of the Republic of Ireland, where companies lay their own information nets at high costs, and where competing companies are asked by the Department of Public Enterprise to share underground channels (sic!), the article praises the Stockholm solution. It ensures that "two surfaces are more level: the playing field of telecoms competition and the city streets" (Telia, 1998-URL:2).

Stokab is mentioned in both articles but it is the Stockholm model that is remembered. Thus, *The Stokab Model*, disguised in the articles as a model of Stockholm, has changed in order to gain spokespersons. Ideas for such models emerge when communication between different times and spaces takes place. As we have seen in this paper, ideas and models travel from one time to another, from one space to another. Once they have been translated into local versions, they come to a temporary stop in a localized model (Czarniawska and Joerges, 1996). Models can then gain or loose degrees of reality if humans and non humans participate in long chains of translation of the model and in action nets (Czarniawska, 1997; Czarniawska, 1999) to construct a locally rooted model. This is what happened to the idea of a national information infrastructure in the United States that traveled through Europe and ended up in Stockholm, translated and made real as *The Stokab Model*, and then on its way back to the world in a somewhat different shape. The model might not have traveled for a long time but Stockholm has become known as an IT city, thus helping city managers in their marketing efforts of their city.

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