ANET Conference 1992

April 26, 1992

Telephony is back – here is Swedish audiotex

by Helena Flam, Tomas Ohlin and Joanna Rose

General background

During the 1970:s and the beginning 1980:s, among many telecommunication operators around the world it has been believed that the future for value added telecom services "automatically" would look excessively bright. Efforts in this field would directly guarentee increased operator power and economic success. The more one invested, the better one stood prepared for the coming birthdays.

The more technology, the better, it was believed. The situation was a clear "technology-push".

The later parts of the 1980:s has come to question this. It has showed to be hard to find understanding for the need for several types of "technology high-end" value added services. As a consequence, operator interest has switched "back" to services that in nature are close to "old" telephony.

Reasons for this development are not primarily the international economic recession and its follow-up effects, but rather a gap in the understanding for what kinds of communication people really need, where true demand is. User demand has showed to be closer to applications than to communications. It has been difficult for engineer-educated telecom managers to accept the needed balance in successful value added services between telecommunications ("bits per second") on one side, and more humanly oriented computer applications on the other.

It is becoming increasingly evident that for success for new services one has to be able to apply application knowledge, and not just telecom transmission efficiency. Since computer application knowledge through personal education background has been more scarse among telecom engineers than pure transmission knowledge, a gap of understanding has developed. This gap thus shows itself between computing and data transmission.

A consequence is that several operators have been forced to leave perhaps tempting new fields of "sexy" high-tech services combined with digital transmission, instead finding themselves turned to the search for more application-oriented services around enhanced telephony.

For some, this has been felt like a relief, not to be forced into the fields of the unknown.

Thus, operator development resources to-day is back in the fields of narrowband, instead of challenging the colourful spectra of broadband. In the early 1990:s most operators stress Kilobit - Megabit services, rather than Gigabits - Terabits. There are simply too limited demand for the higher speed services. Also it should be remembered that enhanced telephony demands limited new investments and new technology.

Demand pull is taking over.

It should be repeated that surprisingly enough, this is fairly new knowledge. Still around 1985 it was broadly believed that the more bandwidth, the better.

This development is the more remarkable considering the rapid development in transmission technology. To-day, optical fibres and radio offer much higher transmission efficiency than yesterday's copper coaxial cables. Also, operator investment cost per transmitted bit has decreased. Even though this is a fact, it has shown to be increasingly difficult to find easily enough administered applications for the new and efficient transmission systems. Consequently, transmission tariffs have had to be

lowered more and more, in search for users. In many cases, the border of break-even has been surpassed. Investment has had to be decreased.

This change in operator investment policy concerns large financial resources. The monopolistic telecom operators of the 1970's and the early 1980's have had access to wide budgets (in the late 1980's Televerket has been Sweden's heaviest investors, spending yearly around 9 billions SEK, 1.5 billions USD).

In Sweden, the PTT (Televerket) has been especially eager to preserve this situation. Public insight in Televerket's investment policy has been counteracted, debate has been subdued. Decisions have been taken in closed rooms.

With this in mind, it is understandable that it is taking time for the monopoly of yesterday to adapt to the market of the mid-90's.

Telecom liberalization in Sweden

Telecommunications are respected as a fundamental structural resource in Sweden. However, its reputation has fallen during later years, due to unflexible administration and low financial results.

A strong form of telecom centralization has characterized the Swedish PTT, Televerket, for the latest dozen years. It has built up a pyramide-like organization, geared by strong hands. One base is technology policy. Defending any steps of change towards plurality, Televerket has used its huge public funds to counteract public debate concerning alternatives. The policy was to petrify what was present.

In the middle of the 1980's it became evident that it would be hopeless for Televerket to continue the monopolistic policy. Liberalization was inevitable. One reason was industrial decentralization and technological minitiaturization, which would be impossible for continued monopolism. Televerket had to give up its resistance against telecom plurality.

The number of employees is probably the best measure of size for public authorities. In 1991, Televerket had some 45 000 on the pay roll list.

Up till the middle parts of the 1980's, there has in Sweden been used an unspoken language of cooperation between the main equipment and system supplier, L M Ericsson, and the sole network operator, Televerket. Only in certain cases, Televerket has chosen other suppliers for subsystems. One example of this cooperation is the development of AXE, the digital telephone exchange system, that Ericsson now markets with great success, especially internationally. This system has its origin in inventional efforts in a jointly Televerket - Ericsson owned development company, Ellemtel. Both Televerket and Ericsson nowadays claim to be inventors of AXE's main ideas.

The Ericsson of the 1990's has broken up from this principal cooperation, and is now acting independantly. Also other suppliers have started to act more agressively on the Swedish telecom market. This is true for different types of equipment, and - lately - also for networks. Today, there exist with the Televerket-administered (state-owned) main network competing network operators. Active here is Tele2, owned by the media group Stenbeck plus Cable and Wireless, with plans to offer both data communication services and telephony in 1993. Other small companies exist. However, the market share of these competitors is still negligable, and Televerket is doing its best to combine the tongue-language using words of competition with market activities to preserve its own monopolistic situation.

The change from centralization to a demand-driven market of the 90's is painful for Televerket. However, this change was decided by the Swedish government at two times in the late 1980's, preceeded by certain public investigations concerning the market and technology development.

The change from a socialdemocratic to a liberal-conservative government in September 1991 has lead to an increase of the efforts towards liberalization in several sectors of Swedish society. The telecom area is no exception.

In Jan 1992, it was decided to incorporate Televerket on Jan 1, 1993. The shares are planned to be dominated by public ownership - for some time. One is careful with plans towards privatization, especially concerning the main network. Discussions are going on concerning a possible organizational split between the main network and all services, including telephony.

A private monopoly is not better for the consumer than a public one, it has been declared from the new government.

A late policy decision was taken by government in the end of April, 1992, when increased telephone subscription fees were decided. It was probably one of the later tariff decisions to be taken directly by government, since such decisions in the future will be taken by "the Televerket company" by itself.

In April 1992, the Swedish government decided to give birth to an enlarged Independant Telecom Authority - Statens Telenämnd (STN). This is to start its activities already in July 1, 1992. Internationally, the STN is comparable to UK's OFTEL and USA's FCC. The activities of STN will comprise:

- Frequency administration
- Technololy, standardization
- Market principles, networks, equipment
- Administration, regional offices
- International representation

It remains to be seen if STN will be strong enough to be able to enforce real reforms for Swedish telecommunications. It should be remembered that Televerkets "market position" still in 1991 showed what is close to a de facto monopoly. Televerket's economy, however - when it was forced to be made public - was not in expansive shape. Investment limitations are being decided, and substancial employment cuts are being implemented in 1992. Critics point at that this is a fruit of a policy of too much technology, and too little demand oriented services, during the 1980's.

Whether international telecom competition really will affect the Swedish market, being situated somewhat geographically off-the-road, is a matter for intense debate in mid-1992.

Telephony is back?

Thus, with organizational market changes, and with low economy, telephony is said to be back in the center of Swedish telecom concern. What "naturally" belongs inside the concept of POTS (plain old telephone services) is analyzed. Especially when understanding has expanded for the capabilities of the new programmable digital telephone exchanges, demand for new telephone-oriented services has increased, including interest for more value-added audiotex. Principally, audiotex started in the middle of the 1980s in Sweden as in several other european countries. One could say, however, that compared to videotex - that had been analyzed and tried out for the main part of the decade - audiotex was a bit late in Sweden.

Statistically, Sweden has for quite a long time been the country with the highest amount of telephones per capita in the world. Today, 8.5 million citizens in Sweden use 6 millions telephones and 300 000 faxes. The number of mobile phones, as well as home PC:s, is also very high.

There are 6700 telephone switching stations in Sweden. 42% of all telephone lines are connected to modern digital telephone stations (AXE or PLUS). The 100% of digital connections in the country is planned to be achieved around the year 2000.

The first AXE digital stations were put to work in Stockholm and Gothenburg (the two largest Swedish cities) in 1980. 74 AXE-stations were planned for 1987. Replacing the old technology with new is said to cost Televerket 2 billions SEK (330 millions USD) a year.

Digitalization and increasing efficiency in the telephone network is one of Televerket's main methods for meeting both deregulation and possibly increasing competition on the telecommunications market.

During the latest decade the telephone network in Sweden was made more efficient mainly by adding radiolinks to the weak points. After 1988 this has also been achieved by introducing fiberoptical cables in the network, and step by step replacing the analogue telephone stations by digital ones. Voice transmission is made digital with help of PCM-technique (Pulse Code Modulation) via codecs that convert analogue signals to digital and back.

The "coming" transmission format, ISDN, integrates switching and transmission and thus allows transmission of voice, data, text and pictures on the same line. The first step for introducing ISDN in Sweden was taken in 1987.

It is a matter of some debate if ISDN will be a success. So far very few users have signed up, because of high cost for limited added value.

Televerket's responsibilities as network operator cover both home telephone connections and firms. Televerket was willing to skip the responsibility for firm telephones as these telephones needed huge investments for services like higher quality fax communication. Today the effectivity of fax is only 86% (meaning that 86% of all fax messages are guaranteed to arrive to the adresate). However, no changes in Televerket's responsibilities have yet been made.

Swedish audiotex

AXE automatic stations have been important for development of audiotex services. For a customer to reach audiotex services there are two possible phone number series, starting with 020 or 071. Although both use a similar technology at the base, they have different functions.

The 020 number makes it posible for service providers to use the same telephone number all over the country. It is of "collect call" type. It is thus used by large companies, that have to pay all connection costs to Televeket by themselves. Their customers pay only the maximum fee for one telephone call (at present 0.29 Swedish crowns, 0.05 USD) regardless of the true duration of the call.

Between 500 and 600 service provider companies have subscribed to 020 services in Sweden up to 1992, and they use 1500-2000 own 020 numbers. There is a large gap between the amount of 020 numbers that acording to Televerket are used by the Swedish companies, and the actual amount of 020 numbers available to the public: only 238 numbers are shown in the newest 1992 telephone directory. 18 of these numbers are Televerket's own, or belong to some of its subsidiaries. Thus a large part of the 020 must be used for internal communication within the companies. Both state-owned firms, as the public SJ - the train company, and big private firms, use 020.

071 numbers are used by firms who charge for the telephone calls. By now there are 300 such firms in Sweden. They use totally 2000 telephone lines (about 1140 numbers in the 1992 telephone directory).

Experimental and Commercial Phases

The audiotex services opened in Sweden officially on the 1st of January 1991. It had then only a few 020 numbers and less than 100 on 071. The field trials have been carried through by Televerket since 1986 for the 020 numbers and from the fall of 1989 for 071.

In the early days for Swedish audiotex services, in 1989, it was mostly believed by Televerket that the manual services were the most important. Experiments were made with 079-numbers. These were used, for example, for medical advising. At the same time a small group within a marketing group in Televerket was developing the automatic audiotex services. Those are becoming fully accepted now.

The acceptance of audiotex services by Televerket lead to a total turnover of 180 millions SEK (30 million USD) for audiotex in 1991. Televerket had budgeted for only 150 millions.

Audiotex Services

Generally seen, audiotex in Sweden suffers, as in other countries, from "bad reputation" as a medium for sex and cheap entertainment. "Sex" and "entertainment" were indeed the biggest audiotex service sectors when it started in 1989, with the Dutch Nijholt as the main information provider. The criticism, as well as cheating, came very soon, so "the bad reputation" was born at the same moment as audiotex. Already one week after start, the main IP - Nijholt, today the biggest service agency in Sweden, got some of its first 100 telephone lines closed by Televerket for breaking the contract. "This is not Holland" Televerket was heard arguing. It also referred to the cooperation contract. Televerket reopened Nijholt's lines three months later (in December 1989). Then Nijholt offered partly new services.

Weather reports completed the information supply in the trial period. The third kind of information available through audiotex was news. TT, a central Swedish news agency, was the main SP. It growed even bigger as audiotex SP with the beginning of the Gulf War. During the war, TT's income was the greatest of all SPs in audiotex. Otherwise, the entertainment and sex lines are the most used, and, according to some Service Agencies, the only ones that give any profit at all.

Today, audiotex tries to develop a new image as a business-to-business service. About 50% of the offered information is "serious": financial information, advertising, news, consulting. However, as mentioned above, the only profitable services so far are probably sex and entertainment.

Audiotex Service Agencies and Service Providers

In 1992, there are ten Service Agencies. They are umbrella organisations for smaller firms who cannot afford the equipment for audiotex. Neither can they afford the deposit needed nor fulfill income rules required by Televerket. Only 3 of the Service Ageencies are Swedish. The other are international enterprises owned by British, Danish or Dutch firms. The biggest Agency is Nijholt, which is of the Dutch origin. It keeps about 50 smaller enterprises under its umbrella.

The umbrella organisations offer both technology and services of different type for smaller SPs. They can play a role of a "responsible publisher" in relationship to Televerket or can do service marketing for their customers. They can also only hire telephone lines and divide the income for their customers. Only about a half (160) of the Swedish SPs have their own contract with Televerket. The others have signed contracts with service agencies which then are responsible for the information content.

As the equipment for audiotex is expensive the majority of the information providers sell their services exclusively through Service Agencies. According to Televerket's audiotex market prognosis, the Swedish market would not have room for more than about 20-25 agencies with their own equipment for audiotex services.

During the last half of 1991, some of the Service Agencies have changed ownership. The biggest one, Nijhot, bought the second large - Esselte Voice. Esselte's high quality equipment was said to be Nijholt's main reason for buying Esselte Voice.

Only one of the audiotex agencies provides videotex services as well. It is Aktievisionen, one the first financial videotex information providers.

The biggest service agency is NTC Nijholt with 50% of the Swedish audiotex market. Nijholt is a leading European and Scandinavian Company for audiotex industry. It was started in Netherlands 1986. Today it has its main office in Stockholm (about 40 employees). The NTC Center in Stockholm with its area of 4500 square meters is, according to NTC, the largest building for voice technology in Europe. After buying Esselte Voice, Nijholt is going to move to an even greater building.

Together with Televerket it planned, designed and operated the first field trial project since it started in October 1989. The main services provided by Nijholt was sex, horoscopes and entertainment. Nijholt today keeps about 50 SPs, and is using about 600 numbers. The most profitable are called "romantic lines", which stand for more than 60% of Nijholts turnover. As all other agencies, Nijholt works both as an umbrella service bureau and as a marketing and advisory agency for other SPs.

The renting of lines from Nijholt demands a deposit of 500 USD. This covers what Nijholt pays to Televerket for lines and telephone numbers.

The two main conditions in the Nijholt´s contract with its SPs are: to respect the law, and not to compete with other services provided by Nijholt.

The size of cost for cooperating with Nijholt is secret. This cost is, however, different for different clients. As Nijholt puts it, it does not compete with price but with the information it provides. Other competitive activities are service marketing and technology (interactive services with dial-tone selection from the menue).

As advertising generally shows to be the highest cost for audiotex service providers, most of the Service Agencies cooperate with daily papers and/or periodicals in order to lower this cost. This naturally is a consequence of the fact that there is no central content service in Swedish audiotex. Any service has to find the customer by itself.

This differs from videotex, where there usually exists a central point of information content, from where you can find your way in the rest of the service supply. However, this difference between the two media forms is based on experience and organization, and is not technologically rooted. It is quite as easy to organize audiotex services around a central information desk, if this should be needed. However, at present this is not considered to be so. Audiotex wants to stand on its own feet as a decentralized service type, even though it shows to be somewhat difficult to reach customers with other types of information than the most lightweight stuff.

Nijholt cooperates with periodicals grouped in Baltic Press, which is directed to a male audience, and which partly is straightforward porno. It has also begun to cooperate with other Swedish massmedia. The dailies, Svenska Dagbladet and Expressen sell advertising by telephone (Expressen uses several Service Agencies).

The central Swedish Radio among other services uses Nijholt's audiotex system to broadcast "Klarspråk", a popular telephone-discussion program, in which the listeners may record their opinions on different subjects.

The "No 2" Service Agency is On Street Marketing, which is a daughter enterprise of the British firm. Its main office is situated in the city Malmö where Televerket's main audiotex marketing agency is also placed. According to On Street Marketing a main ambition is to form joint ventures with different Swedish information and/or marketing firms. The main services On Street Marketing wants to develop in Sweden concern sports and media (subscriptions, reference services etc.), or a combination of these two (i.e. actual match results, lists, both in a daily and by telephone). On Street Marketing also markets certain new applications. For example, it sells Satellite Jukebox, which is telephone-ordering music on TV, quite popular in Great Britain.

During the spring of 1991, Swedish massmedia critisized audiotex, when both private persons and companies recieved large telephone bills because their employees used the 071 numbers from the job telephones. Televerket then opened a function to limit telephone lines for 071 numbers. The technique does not allow to close separate lines. It only allows to break connections after a minimum call cost.

In consequence, by opening business connections to 071-numbers a firm gains access to many unwished-for services that exist in audiotex (the less "serious" ones). There is a clear conflict between a certain number of serious SPs and the others: the serious SPs have openly criticized Televerket for retarding development of audiotex by providing both business information and entertainment through same numbers (071-...)

There are 5 main financial information providers in Swedish audiotex: besides stock exchange information they offer analyses, advising, prognoses and background information about Swedish and international markets. S-E-banken was the first large bank to join audiotex: in the beginning of 1992 they switched their 20 years old stock exchange information telephone line to an audiotex number.

Audiotex technology suppliers

Some of the Service Agencies also market their own equipment. Nijholt sells technology through its subsidiary Voiceq, a hard- and software enterprise which they aquired from Esselte (a leading Swedish publisher) in the end of 1991.

Generally, technology for audiotex is provided by foreign firms. Marconi is a leading one. British and American firms are also present on the market: Telsis Ltd from England, Spectel Communications Inc. from Ireland, and Intervoice from USA.

All telecommunications technology for connection to the public network in Sweden has to be approved by the governmental authority Statens Telenämnd, STN. It functions a controller of telecommunications technology since 1989, when Televerket lost its monopoly on equipment control. In 1992, STN is being expanded in size, and given further policy responsibility (see above in this text). So far, Televerket has provided all its potential audiotex customers with a list of firms that market equipment for voice communication in audiotex.

Costs

The initial costs for starting audiotex services in Sweden are comprised of technology costs and a cost per line hired from Televerket. A computer for voice-services for 30 lines costs between 300 000 and 1 million SEK (50 000 - 165 000 USD).

Televerket's digital connection links (a PCM-system) with 2 Mb costs 48 000 SEK (8 000 USD). A group price for thirty telephone lines is 48 000 SEK (8 000 USD). There are also simpler solutions possible: for example paying one line going through the network to an answering telephone (person or an answering machine) costs 1900 SEK. However, it is very difficult to make profit from only one line.

Ethical Rules and Their Implementation

Because of some disreputable SPs and public criticism, the rules that govern the new establishments in audiotex have changed throughout 1991. It has become harder to start and keep up a new service. A special control group in Televerket has started to monitor the services. In 1992, three persons regularly check tariffs, income and service content. They compare the advertisments of the audiotex SPs with what is really offered.

This control group was decided simultaneously with a decision of accepting all the "romantic lines" (meaning sexual). The idea behind comparing income with offered services is that high income combined with little or no marketing is "suspicious". It indicates an illegal address and/or contact for prostitution. An extra computer makes controls of services during the nighttime possible. If the SP markets illegal services, his connnections can be closed by Televerket. Porno is illegal. Packaging information for different sexes or according to sexual preferences is also illegal.

As a consequence of this type of control, five SPs have been closed for certain amounts of time in December 1991.

There are two special paragraphs in the contract between Televerket and an audiotex SP that give Televerket the right of closing the lines if the content of the services is against the law (as, for ex., personal data collecting). Information with "violent content, or sex that challenges the general public or morality" is forbidden. In several cases, the censorship by Televerket has been applied against marketing of some audiotex numbers.

According to some IPs, in Televerket´s contract the paragraphs limiting the contents of services are not very clear. They allow Televerket to manipulate the market according to their will. Some of the foreign Service Agencies have had lively discussions with Televerket about putting the limits on the contents of services, and threatened Televerket with their solicitors. On the other hand, although in the end of the 1991 the tone of discussions seemed to be quite irritated, Televerket does not want open disputes with the SPs.

The audiotex group inside Televerket was criticised for taking part in a public discussion on audiotex, since its critics claimed that it produced a bad image for Televerket. After a few months of discussions during the fall of 1991, a solution seemed to be found. Both Televerket and the Audiotex Branch Organisation, STIF, are planning to accept an independent consultant, the previous press "ombudsman", as "umpire". He is supposed to propose how an ethical code can be worked out. Some of the audiotex service providers do not accept this solution. They do not see any necessity for a detailed ethical code. They propose a more general code of practise which, they say, would be more useful.

From April 1, 1992, Televerket introduced a solution to another publicly discussed problem of audiotex services. From that time it is impossible to connect to any SP for more than 30 minutes. After that time the line is automatically closed. The problem arose when an SP put a public telephone receiver aside, thus making big money for his own firm. The SP has been punished with 4 months' prison, but a similar situation could repeat itself by mistake (it is not quite clear if it already has happened several times).

Music on audiotex has also been an area of conflict. Some SPs did not pay the usual composer minute tariff for sending music on telephone, as is ususal on TV and broadcast radio. In 1992, however, both Nijholt and On Street Marketing have signed contracts with Swedish music organisations: less than 25% of music on the line costs 6.25% of the income, between 25% and 50% music sent costs 12.5% of the income, up to 75% music on the line costs 18.75% and above 75% costs 25% of the income which has to be paid to the music organizations.

Control Rules

As noted, every new SP has to sign a contract with Televerket (unless the SP uses an already established Service Agency). Between Summer 1991 and January 1992 no new such contracts have been signed by Televerket. On December 3rd, Televerket's Board decided to introduce demand for a deposit of 30 000 SEK (5 000 USD) for all new service customers. This was a reaction to some SPs who tried to make money on audiotex without any "evident" business idea or reasonable marketing effort.

A reputation of audiotex as a profitable business is being marketed in Sweden. However, some SPs argue that no serious services are profitable, and that even "light" services need expensive advertising. Televerket does not make any special marketing effort for audiotex services. The word gets around, the "gossip spreads by itself".

Besides 30 000 SEK in deposit for the first year, Televerket demands an income of 30 000 SEK (5 000 USD) quarterly for each SP. If the SPs income is less than required during the first six months from the start of the service, the SP has to pay the difference in Televerket's part of income between the earned and the required sum (minimum 30 000 SEK).
Such administrative measures are no doubt strong.

Information Users

It is almost impossible to recognize who is calling the 071 number, but it appears from the statistics that most users do not pay themselves for the calls. Most calls are made during the day (when people work). The maximum number of calls occurs after the lunch hour. The second maximum is about 12 hours later, during the night. These last calls can be assumed to be made from private telephones, but they state only a little part of total calls number.
It is today technically impossible to identify the caller by the telephone number he/she is calling from or by his/her credit card. The technique for paying for telephone calls with credit cards is not regarded as safe enough, and still in 1992 not allowed in Sweden (by decision of a Finance Committee).

It was earlier also impossible for private numbers to close a 071- line as it in practice meant closing the home telephone for all longdistance calls. In response to criticism, Televerket made it possible to exclude just the 071-line at the later reopening cost of 400 SEK (70 USD). However, this solution is possible only for telephones connected through AXE (less than 50% of Swedish telephone lines). According to Televerket's customer service, many private users are interested in closing their home telephones for 071 services.

Although conflicts occur, Televerket believes that more and more subscribers are using home telephones for making calls on 071. According to Televerket, the total turnover for December 1991 was almost the same as for November that year, in spite of many work-free days and holidays in December. This could be a proof for the hypothesis that people do call from home.

Televerket publishes no general statistics on how telephones are used in Sweden, what the patterns of telephone use are, or when and by whom it is done. Neither is it possible for the telephone users to get specified telephone bills, for ex., with a list of all calls made from the line. Thus it is impossible to know exactly what one pays for, and to check Televerket's bills. Only when telephony competition arrives, price comparisons will be possible.

Tariffs

Table: The tariff structure of the Swedish audiotex 071-numbers, 1992

Tariff	SEK/min excl. VAT	SEK/min incl. VAT	Televerket's part	SP's part	VAT
071-2xxx	3.65	4.55	1.65	2.00	0.90
071-3xxx	4.90	6.20	1.80	3.10	1.30
071-4xxx	6.90	8.65	2.00	4.90	1.75
071-5xxx	9.90	12.35	2.25	7.65	2.45
071-6xxx	12.50	15.70	2.50	10.00	3.20
071-7xxx	15.30	19.20	2.75	12.55	3.90

The lowest tariff, 1.65 SEK payed to Televerket, is a sum of a highest longdistance fee for one minute's telephone connection in Sweden, 1.20 SEK, plus 10% of the IP's income per minute, 0.20 SEK, plus 0.20 SEK extra.

Everybody can connect the lowest tariff number, 0712, (unless the telephone is closed specifically for these numbers). All the other 071 numbers can only be reached from telephones that are connected to an AXE-station. In the Swedish telephone directory for 1992 there are 1138 audiotex 071 numbers. According to Televerket, 2000 numbers are sold by now This must mean that almost half of the numbers are not yet active and have no services behind).

Eighty-one numbers have a tariff higher than the lowest one. Five of these numbers use a special tariff that can be connected by dialing 079. These are medical and psychological consulting as well as 3 "contact lines". By calling 0714 numbers (17 in the catalogue), the user can get a horoscope, weather report, etc.

Behind the 0715 numbers (19 in total) are dream interpretations and the like. Financial information and analyses or reports on foreign stock markets often use the 0716 tariff (19 numbers). The latest news and consulting can be reached by the more expensive 0717 (21 numbers) as well as tips about the best wine sorts in stock.

As mentioned, the total turnover of 071 services in 1991 was about 180 milions SEK (36.6 millions USD), 110 milions went to SPs. It is Televerket that is responsible for all payments for connections in audiotex. SPs are payed every month for the previous month. To all firms which they have a direct contract with Televerket, Televerket sends the SP's part of the income and time statistics. The Service Agencies divide the income further and send it to their own SPs. The users pay telephone bills quarterly (although, as mentioned above, without any specified information on the bill).

In contrast to the videotex SPs, in general the audiotex SPs seem to be satisfied with Televerket's administrative effort: the payments and the traffic statistics. The only minus is contracting the services. It takes more than three weeks for Televerket to check firms which want to sign contracts.

TABLE

Digitalisation of the Telephone Network in Sweden

Year	AXE-connected
1991	42%
1992	52%
1993	62%
1994	72%
1995	82%
1996	90%
1997	92%
1998	94%
1999	97%
2000	100%

Future plans

Televerket´s plans for the 1990´s are to further develop audiotex services, their hope is that "serious business" will have a larger part of the proposed services (such as weather, news and consulting). But as a matter of fact these "serious" services are today scarcely income bringing - it still is entertainment, sex and dating that are the most lucrative. The two largest Service Agencies, Nijholt and On Street Marketing, compete, beside sex, with sports information, tipping, interviews and latest news. Especially popular sports in Sweden are ice hockey during winter, and football during the warmer period, both agencies have information about these sports, dividing sport clubs between each other. Several other audiotex agencies have sport lines by now. There is also V65, a horsetipping system, as well as some other sport - based services.

It is worth considering if audiotex has a solid expansion possibility for the 1990´s compared to other media forms, like videotex. There is also the development of so called "multimedia", where combinations of text, picture and sound are transformed into presumably tempting packages of colorful services.

An example of a combined service is the coupling between audiotex ordering and cable TV delivery of amusement programs, already available in Sweden.

The number of "smart-phones" that are being marketed starting 1992, will perhaps bring new media-combinations. However, looking at a smart-phone from a user's perspective, it is most appropreate to refer it to the videotex family, even though it is not planned to use today's videotex standards. The smart-phone services look quite like videotex services.

A reform is being implemented in 1992-93 in Swedish videotex. The centralized Bildschirmtext system is being changed into a more decentralized system, more resembling the french Télétel, but with higher security. The new network system is planned to resemble audiotex, concerning database content functions and user navigation facilities. For an average videotex user, and especially for the expanding groups of TeleGuide users, there is not supposed to be changes in system behaviour. However, the new Swedish videotex network is not completely defined in all details, as of May 1992.

The future for Swedish audiotex naturally depends on the creativity among service providers to find new and challenging services. On line betting with direct financial gains could be one such service. However, as of 1992, this is forbidden in Sweden. A public committee is analyzing this situation, and it is possible, if perhaps not probable, that some form of audiotex and videotex on line betting will be allowed in the future. The Swedish participation in the european Common Market - that is being planned - will surely affect this. Telecom networks are available over national borders, and it is becoming more and more difficult to nationally regulate easily defined services. If you can't bet using a Swedish service, you can always call up french Télétel.

The future for Swedish audiotex concerns a limited number of dedicated and easily understood services. Audiotex is a narrow medium, its sister medium videotex is wider. But they go hand in hand.