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Interactive Television Experiments in the United States of America – Is There a Lesson to Learn for Journalists Working in Television of Tomorrow?

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Tiivistelmä - Abstract

Yhdysvaltojen televisioteollisuus on jo kahdenkymmenen vuoden ajan kokeillut vuorovaikutteista televisiota käytännössä. Nyt näyttää siltä, että teknologinen kehitys ajaa televisio- ja tietokoneteollisuuksia yhä lähemmäksi toisiaan ja ne lopulta yhdistyvät – vielä ei tiedetä, milloin tämä fuusio tulee tapahtumaan. Interaktiivinen televisio yksittäistalouksissa näyttää siis vihdoin toteutuvan tiedon valtatiehen yhdistettynä kotipäätteenä tarjoten katsojalle valtavat valinnan mahdollisuudet. Mikä sitten television tulevaisuus onkin, varmaa on se, että erityisesti uutistyötä tekevät journalistit kohtaavat uudenlaisen vuorovaikutuksen katsojan kanssa. Tilanteessa, jossa olemme siirtymässä uuden, interaktiivisen television aikaan, on haastavaa tarkastella lähemmin jo tehtyjä vuorovaikutteisen television kokeiluja. Yhdysvallat on antoisa tarkastelumaana, koska siellä maaperä on ollut erityisen hedelmällinen kokeiluille. Kääntöpuolena erityisesti journalistisen tarkastelun kannalta on se, että USA:ssa toimittajat on usein sysätty sivuun viihteen tieltä. Saattaa olla, että juuri tästä syystä journalistiikasta vuorovaikutteisessa televisiossa on kirjoitettu kovin vähän ja tämä tutkielma onkin ensimmäinen yritys yhdistää saadut kokemukset. Tutkielman tulosten valossa on perusteltua väittää, että yksi tärkeimmistä syistä kokeilujen epäonnistumiselle Yhdysvalloissa on ollut journalistisen sisällön puute ohjelmistossa. Selkeä on myös se tosiasia, että menestyäkseen vuorovaikutteisen television pitää luoda uudenlainen ohjelmarakenne, joka ei perustu ainoastaan vanhaa televisio-ohjelmaa uudessa paketissa tarjoilevaan tilausvideopalveluun.

Asiasanat
Interaktiivinen televisio, vuorovaikutteinen televisio, Yhdysvallat, USA

Säilytyspaikka

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ABSTRACT

Television in the United States of America has now been experimenting with various forms of interactivity for about twenty years. The stream of technological development seems to be driving the television and computer industries closer and closer together and finally merging these into one – when and how this will happen still remains open. The interactive television in the individual household seems finally to be about to come true in the form of a home terminal in the information superhighway providing the consumer with an enormous amount of control over his television programming. Whatever the future for television is, journalists working in the broadcasting business, especially in news-type programming, but also in reality-based programming and the in the new "infotainment" industry, will be facing a new kind of interaction with the consumer. In this new situation of two-way television, it is rewarding to look back to the experience of interactive television especially in the United States, where the ground has perhaps been the most fertile for these kinds of experiments. The dark side of the interactive television experience in the United States – looking back on it as a television journalist – is the fact that these experiments operate almost entirely on commercial grounds and serious journalism has usually been set aside to make way for entertainment. Perhaps this commercialism is the main reason why there is so little written about journalistic work in interactive television and this research paper is perhaps the first real attempt to bring those journalistic experiences together. It seems to be that on the basis of this study, the most important lesson is that most of the experiments done in the United States of America have failed because of lack of journalistic effort. This study also states that to be viable, interactive television has to develop an interesting content of its own: a content that does not simply just offer the same programming in the form of a video-on-demand service.

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INTRODUCTION

Finnish television interactivity took one of its first, real big steps in the summer of 1995 when a Finnish phone operator, Helsingin Puhelinyhdistys (HPY), along its co-operators introduced an experiment using the latest interactive television technology in Europe. For a small number of consumers in the Helsinki area (in Lauttasaari, Helsinki) additional, interactive television services were available through the phone-network. The project offered video-on-demand, including films and music videos. Interesting from the journalistic point of view was that the Finnish Broadcasting Company, Yleisradio (YLE), was also part of the experiment, providing news-on-demand for the television viewers (Helsinki Telephone Company, 1995). Although it may not seem directly relevant to the title of the work, a paragraph about the Finnish situation has been included as it may give an interesting perspective, especially to a Finnish reader.

Although the Finnish experiment was not interactive in the sense of the (traditional) definition of interactive television, because the viewer cannot actually take part in the program (the viewer does not offer "a return information path" back to the television studio, which would influence to the actual content of the program), it is still a considerable step towards "the viewer's greater control over the content of the programming in his television set"; the viewer, for example, can watch the latest news anytime, no matter if the time is 5.16AM or 4.12PM, instead of the traditional time of Finnish evening news, 8.30PM.

It is important to notice that the tradition of cable television, which in many cases makes it much more simple to offer interactive services, is not nearly as long in Finland as it is in the United States of America. In the United States television practically started with Community Antenna Television (CATV, the early term for cable television) in the 1940s and cable has for decades been the primary source for receiving the television signal. In Finland, however the penetration of cable has just recently reached fifty percent. (Dellinger, 1995, p. 28)

Keeping in mind the long traditions of cable television it is easy to understand

why experiments in the field of interactive television and new ways of providing information to television viewers overall started in the United States already in the 1970s. Also the lack of a governmentally owned monopoly in television broadcasting in the United States has provided fertile ground for small, private interactive television experiments, unlike in Finland.

During the past twenty years the United States of America has been a laboratory for various forms of interactive television experiments. Since the times of Time Warner's Qube experiment, which tried to "pull the viewers in" and make them be an actual part of the television program production process, the idea of interactivity has changed, not to mention the progress of technological evolution. Today the focus in interactivity for most operators seems to be almost entirely on video-on-demand (or near-video-on-demand), which actually does not follow the original model of an interactive television program: in the video-on-demand environment the viewer can only influence what is displayed on his own set, and not influence the actual content or scripts of the programs. However, experiments in interactive television create a fascinating history of their own, and it is rewarding to examine this experience as a whole and try to bring the results together.

The research introduces the technology used in interactive television, but the main focus is rather on the programming of these experiments. In the programming the focus is on the type of television content, requiring journalistic work. Traditionally this means news type programming but nowadays it can often also mean the so-called infotainment – television programming which contains elements of both information and entertainment.

One basic observation in the field of interactive television is that there is very little written about the journalistic work in the experiments done. This leads to the main question of the study: has journalism in these interactive television experiments at all played a role worth mentioning, and if not could this be one of the reasons why interactive television, despite the techinical possibilities, has still not become economically viable.

I. Definitions of interactive television

The so-called traditional television, the broadcast television we have known for about fifty years, is a one-way medium, meaning that the television signal comes to the individual TV set via antenna, cable or satellite dish and ends there. However, as Nicoll (1996) points out, ironically the earliest television experiments involved two-way communication systems. It was the economical, social and political factors that forced television into a one-way mass medium. When comparing the interactive television experiments to "traditional" television it is important to notice that it is not like replacing an old technological invention with one totally new invention (so it is not like, for example, comparing the "new" FM-radio technology to the "old" AM-radio): the technological solutions that can be used in interactive television are numerous. As Carey and O'Hara (1985) put it: "Interactive television is not a single technology or service but a family of diverse systems and applications that trace their history to the very beginning of television" (p. 220). Raimo Lång, a researcher in the University of Art and Design, Helsinki, goes even further: "Interactive television is a loose concept, which is not even worth trying to define" (Lång, 1997).

A. The traditional definition of interactive television

Blahut, Nichols, Schell, Story and Szurkowski (1995) describe interactive television:

> Interactive television (ITV) is a new form of residential consumer video service that gives viewers far greater control over the contents of programs than is possible with conventional television. There are substantial technical challenges to offering ITV service on a large scale, both in content creation and delivery. (Blahut et al., 1995, p. 1071)

In interactive television the one-way flow is replaced with a two-way-signal, allowing the viewer to interact with TV programming. The signal the consumer receives consists of interactive signals, in addition to the traditional programming signal. The interactive signal can be delivered using a variety of different kind of methods, for

example using a separate TV channel, FM radio channels, telephone lines or satellite, just to mention a few. The signal from individual homes to the TV station is "the new return path that makes television truly interactive". (Anderson, 1994)

In the simplest form of interactivity, the TV program can instruct the viewer to do something, for example to do aerobics along with the program or to call into a talk-show and be "on-the-air". In order to accomplish more advanced forms of interactive television, the TV set must be accompanied by additional intelligence (at the moment, that is). Especially in the United States of America, where interactive television in most cases operates via cable, interactivity is usually achieved by a small cable-like box which is attached to the TV set. The box allows communication back to the television studio. Often the boxes come with a printer to output coupons, weather reports and other additional services. (Anderson, 1994)

According to the original idea of interactive television, at least on the basis the experiments made especially in the 1970s, the interactivity was to give the viewers a chance to take part into the actual production process by allowing the viewer to interact and change the actual program content. This was accomplished for example by talk-shows where viewers could vote for program content or take part in instant polling.

B. The levels of interactivity in interactive television

There is a variety of views about the level of interactivity in different technical interactive television solutions. Johnson and Tully (1989) use the evening news as an example: when the news anchor is talking with the correspondent in London or Moscow and they can both see and talk with one another, the system could be considered totally interactive. Although, to be exact, the viewers have only a passive role in the event and they cannot for example discus the news item with the anchor or the correspondent and vice versa. (Johnson & Tully, 1989, p. 9).

Hackenberg (1995) introduces a model of seven different levels of interactivity created by the consultants of Next Century Media. The lower level of interactivity according to this model is divided into two steps: in the very lowest step the analog

broadcast television set is equipped with an overlay and response button and the service can for example offer the viewer a chance to order a pay-per-view movie or to guess the next the play on NFL football. The second step of the lower level is either analog or digital, but still broadcast television, offering near-video-on-demand and pay-per-view. The five steps of the higher levels of interactivity all include digital technology. The first step includes a small switch digital system with near- and true-video-on-demand. The second step is all true-video-on-demand, the third fully interactive, the fourth video teleconferencing and the final, fifth step includes a digital studio with programming creation, editing and special effects. (Hackenberg, 1995) The model in detail is displayed in Figure 1.

Seven Levels of Interactivity by Next Century Media.

Lower Levels		
*	Analog broadcast TV with overlay and response button	Order PPV movie, guess the next play on NFL football
**	Analog or digital, but still broadcast	Near Video on Demand; staggered start PPV, four to eight channels
Higher Levels		
***	Small switch digital system, but still broadcast	Near and True Video on Demand; addressable commercials, hot links programming to commercials
****		True Video on Demand (no waiting) in programming and advertising
*****	Full interactivity, complex branching	
******	Video teleconferencing	split screen with Larry King live
*******	Digital studio	create programming, editing, special effects

Figure 1. (Hackenberg, 1995)

C. The modern definitions of interactive television

In this study the definition used for interactive television is extremely loose: the research paper describes both a system, where the interactivity takes place more in the production process than in the delivery (Berks Community Television, Reading, Pennsylvania), and a teletext-type of solution, where the television "acts as an electronic newspaper" (Viewtron, Miami, Florida). Especially in the part about the history of interactive television in the United States, the study tries to include all the significant experiments towards "the viewer's greater control over the programming content in his television set".

In the mid 1990s, the traditional definition of interactive television seems to be largely outdated. The operators of the new experiments seem to be loosing their trust in the viewer as an active part of the production process of the television program. The viewer is no longer desired to be a scriptwriter for the whole television audience, just for his own set. The experiments of the 1990's seem to concentrate on various forms of video-on-demand, where the consumer can have great influence on the content of his own television program, but not on what's displayed on the other viewers sets.

The loose usage of the term interactive television is of course strongly connected to today's technological development, which is, very quickly, bringing at least television and computer technologies together (not to mention multimedia, wireless telephones and so on). At the Interactive Television '96 Conference, held at the University of Edinburgh, Scotland, interactive television was defined to include: "... the provision of all kind of interactive multimedia services to domestic spaces". But, as the conference wanted to point out, the perspective is often even wider: interactive television is closely related to numerous forms of new (and old) technologies: "infohighway, superhighway, infobahn, networked multimedia, broadband services, Internet...". (Nicoll, 1996).

Two terms that are often also mentioned especially with interactive computer programming but sometimes also with interactive television systems are *linear* and *non-linear*. Most of the interactive television programming solutions are linear, meaning that the television viewer cannot for example "jump" to the end of the program and watch the rest of the program segments in random order. In non-linear programming

"jumps" are possible. In video-on-demand solutions rewinding and forwarding is of course possible but it is still not considered to be non-linear. In the computer environments non-linear products, such as CD-ROMs, are becoming more and more popular. (Kommonen, 1997)

II. Technical solutions in delivering the interactive television signal in the United States of America

In the United States of America most of the experiments in interactive television deal with cable television. This is due to the long traditions of cable television (originally Community Antenna Television, CATV) and the high penetration of cable: nearly 70 percent of the households in the United States subscribe to cable and the penetration rate of cable (the households that are within the reach of the cable, in other words, the households that could subscribe to cable if so desired) is over 90 percent. It is also important to mention, that on the top of the cable numbers there are quite a large number of experiments which deal with the so-called wireless cable and microwaves. The situation in the United States is also about to change due to the technological inventions and the new legislation. In August 1995 Wright wrote about the competition the new telecommunications legislation is supposed to bring: "Once the broadbandwidth version of cellular technology emerges, however, competitors will be able to skip the arduous task of laying fiber optic cable into homes that currently forces them to play by the cable companies' rules". Perhaps, however the phone companies are even more in entering the into the cable market than the operators in cellular technology (Johnson, 1994, p. 49). In 1996 the Government of the United States signed the new Communications Act, and, among other things, the phone companies were granted permission to enter the cable television market. However, because the phone companies entry to the market is a brand new phenomenon, its consequences are not yet widely known nor examined (Duncan, 1996). Also, due to the high penetration of cable in the United States, the main focus of my research is on interactive cable television, nowadays using fiber optic communications.

There are several different technologies in linking the provider of interactive television services and the individual users of the service (whether individual households or group environments, such as restaurants and schools). Johnson and Tully (1989) introduce the basic technical solutions used in Interactive Television: Progress and Potential and although their examples describe linking schools with interactive

capabilities, the same technologies can be used practically everywhere when delivering interactive television signal.

A. Instructional Television Fixed Service (ITFS)

Instructional Television Fixed Service as a system was authorized by the Federal Communications Commission (FCC) in 1963 and is a licensed service operating under the regulation of the FCC. The ITFS system usually consists of a central transmitting station equipped with an omnidirectional antenna transmitting up to four video and audio channels. The receiving end is equipped with a parabolic antenna which receives the broadcast signal. The return path of information from consumers back to the provider of the service is usually delivered using terrestrial (point-to-point) microwave. According to Johnson and Tully (1989) ITFS is one the cheapest forms of interactive linking, when used in group consumer environments, such as public schools. (pp. 12–13)

B. Common-carrier Telephone Lines

The second way of connecting sites for interactive television is through telephone companies or, in other words, common-carrier. To deliver the interactive television signal the telephone companies use copper wire in cables, microwave technology, and fiber optics. (Johnson & Tully, 1989, pp. 13–14)

Generally the use of common-carriers in delivering the interactive television signal has been relatively high. At the moment in the United States the telephone companies are showing tremendous interest in entering the television markets overall and also seeing the possibilities in interactive television as a path to compete with cable operators. Finally the new Telecommunications Act of 1996, passed by the US Congress, makes it actually possible for the common-carriers also to enter the television markets. (Telephone companies as deliverers of the signal in interactive television are discussed in the chapter VII.)

C. Terrestrial and Satellite Microwave

Johnson and Tully (1989) describe the history of terrestrial and satellite microwave systems:

> This system was first used commercially by telephone companies for intracity connections. Soon railroad and public utility companies became heavy users of this technology. Because microwave signals are line–of–sight and are limited by the curvature of the earth and topography, a system of antenna towers was necessary to transmit signals over longer distances. This limitation was overcome with the advent of communication satellites, which orbit the earth and bounce back signals to local cable companies and to homes with satellite dishes. Today, communication satellites make it possible to have instantaneous worldwide television communications. (Johnson & Tully, 1989, p. 14)

Due to the complex and expensive technology used, the satellite connections are relatively expensive and due to the costs: "...most satellite transmission systems are owned by large corporations and used for one-way programming over a wide area" (Johnson & Tully, 1989, pp. 14–15). Still satellites, at least providing the downstream programming (from television stations to consumers) are "considerable players in the interactive game", especially when the upstream information (the interactive signal from viewers back to the television station) is delivered using, for example, common-carriers or cable operators.

D. Cable television systems

Perhaps the most natural solution for interactive television signal delivery in the United States of America is the cable network, due to its penetration. The problem with cable, especially with upstream information, has been the lack of two-way capability with copper wire. Nowadays the copper wire is at an increasing pace being replaced by coaxial cable.

1. Community Antenna Television (CATV)

When the first television stations in the United States were built in the late 1940s, most of them were located in large urban areas, and the rural areas had only poor reception or no reception at all. The solution for this problem was community antennas: tall towers on hilltop locations with receiving antennas that could bring in the signal from distant stations. From community antennas the television signal was then run into individual households via cable.

During the past fifty years CATV has "mushroomed" as an industry: by 1983 there were 4,700 operating systems serving 23 million households in the US. As Johnson and Tully (1989) mention, already in the late 1980s cable systems with 30,000 to 50,000 subscribers were commonplace and many systems offered shop-at-home services and viewer response programming. Johnson and Tully write: "They also have great potential for interactive television instruction if bi-directional audio amplifiers are connected to the cable" (Johnson & Tully, 1989, p. 15)

2. Fiber Optic Cable Systems

The next generation of the Community Antenna Television technology is fiber optics cabling. The glass fiber can transmit multiple times the amount of channels and information that the traditional copper wire can. The fiber optic cable can transmit television, telephone and computer data signals converted to light waves up to forty kilometers without the need to amplify the signal.

As Johnson and Tully (1989) mention: "The possibilities for the use of fiber optics for interactive television and voice and data transmission are tremendous" (p. 16). The fiber optic cable provides high quality connections for the needs of both, the upstream and the downstream information.

Most cable systems in the United States of America built since 1972 have two-way capability. At that point the US Government officials (Federal Communications Commission, FCC) started to require two-way capability from new cable systems, excluding

the all smallest ones. Two-way capability, to put it as simply as possible, means the capability to deliver signals from individual households back to the cable company, not only, as it had traditionally been, to deliver the television signal from the cable company to the consumer. Two-way capability was made possible primarily by the developments in fiberoptics, which are now used in the delivery of the television signal. Fiberoptics can deliver up to hundred times more information and television channels than the traditional coaxial cable. (McVoy et al., 1984, p. 5)

Two-way capability itself does not mean that the cable system can provide two-way services. An operational two-way system has to have the required equipment in both ends of the line, in the headend (the cable operator) and in the individual households. The nature of these so-called home terminals and the headend equipment determines which kind of two-way services are offered. (McVoy et al., 1984, p. 5)

As McVoy et al. (1984) wrote already in the 1980s, the terms *two-way* and *interactivity* are often used to mean the same technology and used interchangeably, which, narrowly defined, is not correct. Interactive cable, strictly defined, is "a two-way application where signals flowing between the headend and district receiving points affect each other simultaneously" (Kimmel et al., 1984, p. 331)

E. Interactive Video and Data Services (IVDS)

Johnson (1994) describes Interactive video and data services system: "Developed in the 1990s, it permits television viewers with special terminals to respond to questions and options shown on television programs. Polling, order taking, and student responses to instructional programs are among the possible applications" (p. 47).

The brochure of one of the operators licensed by FCC, Charleston Interactive TV Partners (CITV), boasts about IVDS:

> Interactive Video & Data Services is a brand new medium licensed by the federal government through the FCC. It is the only wireless service brought into the world solely to be used for Interactive Television. Among the methods of bringing Interactive television into American Households, IVDS

likely will be the first to become widely operational.

(Charleston Interactive TV Partners [CITV], 1996, p. 2)

CITV also predicts the future of interactive television from the perspective of IVDS: "Interactive television is projected to a gain substantial share of the nation's TV market as it becomes widely available. By the year 2000, an estimated 40% of US TV households will be Interactive Television subscribers: that would be approximately 40 million households" (CITV, 1996, p. 2).

III. The history of interactive television in the United States

In many resources that deal with interactive television in the United States, the earliest experiments in the field mentioned are from the 1970s. Usually the history of interactive television is quoted as starting from Time Warner's Qube experiment in the mid 1970s. However, especially if the definition of interactivity is understood liberally, the audience response and participation in television programming was invented long before the Qube experiment.

A. From 1920s to the late 1960s

As mentioned earlier, the roots of interactive television are in fact in the early days of television. In the 1920s in the early television experiments one of the test formats was interactive communication, containing one-way video and two-way audio. Carey (1994) mentions "a simple but clever form of interactive television" created by CBS's children's series, called Winky Dink and You (1953–1957):

> The interaction was created through the use of a special plastic sheet that children could purchase at local stores and then attach to the TV set. In the program, Winky Dink, a cartoon character, encountered many problems, such as being chased by a tiger to the edge of a cliff. Children were then asked to help Winky Dink escape from the tiger by drawing a bridge on the plastic screen. One obvious problem with this format was that some children did not purchase the special plastic sheet and simply drew with crayons directly on the glass TV screen. (Carey, 1994)

Another early solution of interactive television was a show called Person to Person, where a show-host, Edward R. Murrow interviewed guests in their homes without leaving the studio; in fact, there often was a considerable distance between the television studio location and the guests home. The show was reported to be a commercial success, but, as Carey and O'Hara (1985) point out, the interactive format was very crude: "In fact,

the guests could not see Murrow though they often pretended to see him" (p. 220).

Carey and O'Hara claim that the modern era of interactive media began in 1964, when AT&T demonstrated a picture telephone at the New York World Fair. Even though picture telephone was not highly successful partly because of the poor picture quality, it found some practical applications, such as videoconferencing. The most important thing the picture telephone did, at least from the viewpoint of the development of interactive television, was that as a result of it, many began to explore commercial or institutional applications for interactive video. (Carey & O'Hara, 1985, p. 220) The picture telephone was still used in the 1960s successfully in some environments: one version of the technology was used in the courtrooms (Lång, 1997).

B. Interactive television in the 1970s

Carey sees the 1970s as an especially active era for the development of interactive television because of the numerous experiments in education, community services and worker training. The most important of these non-commercial projects in the 1970s was funded by the National Science Foundation, which funded three projects; one in Reading (Pennsylvania), one in Spartanburg (South Carolina) and one in Rockford (Illinois). As Carey mentions, experiments in two these locations died out relatively soon, but one, in Reading (Pennsylvania) "stands as a curious oddity". (Carey & O'Hara, 1985, p. 221).

The most important experiment in the field of commercial interactive television was also introduced in the 1970s. The system was called Qube: Time Warner Amex's interactive system first introduced in Columbus, Ohio.

1. Berks Community Television (Interactive Television in Reading, Pennsylvania)

The non-commercial interactive television system in Reading, Pennsylvania and its interactive channel, Berks Community Television, was one of the three multimillion dollar projects funded by the National Science Foundation in the mid-1970s. The National Science Foundation was especially interested in the possibility of interactive cable

television as a deliverer of social services and education.

Perhaps the most interesting aspect of the interactive television system introduced in Reading was that already before any decisions were made about the technical capabilities that would be used or what the programming would be like, "the project team undertook extensive organizational work within the community". The project included right from its early days the local cable company, the senior citizen council in Berks County, the local housing authority, the City of Reading itself and some departments of New York University. When some basic decisions about the construction of the system had been made, the building of the system itself began. The interactive television system of Reading decided to rely on the local work force as much as possible: a staff of technicians and camera operators were hired locally, a community board was established and a programming committee was founded. As Carey and O'Hara (1985) mention, one of the key points in making the system viable, was that "the transition process from a federally funded experiment to an ongoing local system was begun on the first day of the project" (p. 222).

In the article published in Transmission: Toward a Post-Television Culture, (d'Agostino, 1995) Carey and O'Hara describe very thoroughly the technical solutions used in Reading's interactive television system. However, for this particular study with journalism in the focus, the technology is not the most important thing. Still, some basic description of the technology used is essential for us to understand the system's possibilities.

The most outstanding point of the Reading interactive television system was that it was built as simply as possible: "There was a conscious effort made by the NYU [New York University] project team to build up a simple and modest technical configuration that would lend itself to operation by individuals with little or no technical background". The production studios were called "Neighborhood Communication Centers" and most of the programming was based on the interaction of people in these three locations, although a few remote sites could also be linked to the system. (Carey & O'Hara, 1985, p. 223)

The programming was mostly based on a talk-show format. People from three different locations were shot with black-and-white cameras using conventional camera

angles. In the television sets of individual television viewers, the three locations were set side-by-side, all looking straight towards the television viewer (afterwards widely used for example on CNN's international live-connections, "Atlanta-Washington-Jerusalem-live"). Carey reports numerous problems in the production system, especially in the audio system, simply due to the "elementary-school-technology" used. (Carey & O'Hara, 1985, pp. 223–224)

Most programming in Berks Community television could be categorized as talk format; it was black-and-white (before adding on more studio and turning to color in 1981) and 90 percent of it was live. It is important to notice that interactivity in Berks' case meant more interactivity in the production process than in the distribution; the viewers watching the interactive programs could call in and participate in audio-mode only (calls from homes were solicited frequently during many of the programs). The national funding for the Reading interactive cable television ended in 1977 and since then the system has been operating under local funding and local management.

Carey and O'Hara (1985) see the Berks Community Television as an experiment that: "Has not been replicated elsewhere, nor should it, because its system design, program style, user groups, and content have been specially tailored to conditions on Reading". Still it is useful in discussing the fundamentals of interactive television: "Is interactive television thrown into the mix, just a new format for normal one–way television, or a new medium entirely" (pp. 231–232). Lång (1997) sees the Reading system as "a format, where elders were making programs for each other".

Berks Community Television is still operational today (1997) and operates basically under the same circumstances and for the same goals as twenty years earlier. A brochure of Berks Community Television states the following as the philosophy of BCTV:

> Berks Community Television's goal is to improve the quality of life for the people of Reading and Berks County by encouraging dialogue among diverse segments of the community on a variety of topics. Through live interactive programs produced by volunteers, BCTV brings to the community the best possible educational and informational programs, and provides a unique opportunity for volunteer activities.

(Berks Community Television [BCTV], 1995)

On the second week of February 1996, the Berks Community Television had programming on weekdays daily from 10 AM (from 8 AM on Tuesday and Thursday) to 10 PM (to 11 PM on Thursdays), on Saturday from 11 AM to 10 PM and on Sunday from 7 PM to 11 PM. At nighttime, when there was no actual programming, the channel was tuned into "Community Bulletin Board". The share of prerecorded programs during the research week was over 50 percent and length of the programs was either 30 or 60 minutes. (BCTV, 1995)

2. Time Warner Amex's Qube

The first real commercial interactive television system in the United States was introduced by Warner Amex Cable Communications in December 1st, 1977. Qube system was first provided to the consumers of Columbus (Ohio) and then expanded to serve also the consumers of Cincinnati (Ohio) and Pittsburgh (Pennsylvania). The experiment was expensive and innovating, and it provided the consumer with a special remote control which offered an array of interactive programming, including entertainment and pay-per-view sports specials, shop-at-home services, home banking, data retrieval, instant audience polling, educational courses and local origination shows. (Advertising Age, 1982, Dec. 6)

After being in operation for five years, Qube system was indicated as being extremely popular among consumers and "just about to hit its full potential" by the magazine Advertising Age. According to officials the biggest contribution that the Qube had made was giving the consumers a feeling that "they had control over their television sets". At the same time the officials of Warner still admitted that, after all, the consumers seemed less impressed by the interactive technology than they had supposed and hoped them to be. The media itself seemed to be more intrigued by the interactivity than anyone else. In 1982, celebrating its fifth anniversary, the Qube system still promised to expand to the consumers in Dallas and Houston (Texas), part of New York (New York) and the suburbs of St. Louis (Missouri) and Chicago (Illinois).

Despite boastful reports of being successful and plans to expand, only a few years after, in 1984, the press declared the Qube system to be in serious financial difficulties. In January 1985 Warner "pulled the plug" on its interactive programming as a cost-cutting move. Advertising Age magazine declared, that the results of Qube were mixed (Advertising Age, 1985, Jan. 7). Despite its mixed results Qube as a system had proved itself to be highly vulnerable, extremely expensive (due to the high maintenance costs), and the remote controls and Qube set-top-boxes were declared as failures, not working properly "in an increasing rate". (Broadcasting, 1984, Jul. 2)

According to Carey (1994), despite the fact that many households subscribed the Qube service (in the areas where it was offered), the actual use of its programming was relatively low. Still Carey wants to point out that Qube introduced a number of interactive formats that have since then been adapted to broadcast and cable programming. According to Carey: "Both MTV and Nickelodeon roots to Qube's experiments. In this sense, it was an important programming laboratory".

In 1984 the largest MSO (Multiple System Operator), Tele-Communications Inc. (TCI) made an offer to buy Warner's Qube system in Pittsburgh and presented plans to replace interactive service with movie-on-demand -services (Broadcasting, 1984, Jul. 2). In the beginning of the next year Showtime and Movie Channels were negotiating taking over the Qube system and creating the first national pay-per-view movie service. The time of Warner's interactive Qube was over.

Carey (1994) writes about the results of Qube:

> The principal lesson of the Qube experiment is not the failure of interactive media in competition with traditional mass media. Rather, interactive media must be developed in a viable economic and technical context. Even with these elements in place, producers must learn to create with the new medium, and audiences should not be expected to change their media habits overnight. (Carey, 1994)

C. Interactive television in the 1980s

Carey (1994) writes about the experiments of the 1980s in the field of interactive television in the United States:

> During the 1980s, a broad scope of media offering limited forms of interaction or greater control over media consumption was introduced into businesses, homes, libraries and schools, some of the consequences of which are of note. First, the marketplace acceptance of the technologies has been complex and dramatic--extraordinary successes (VCRs), extraordinary failures (interactive videodiscs) and a few technologies that seem to ride waves of success and failure (video games). If there is a lesson in this marketplace history, it may be that the interactive media industries are as volatile as the entertainment and toy businesses. (Carey, 1994)

Perhaps it was in fact the innovations closely related to the television (such as the home videorecorder, VCR) that held down the amount of brand new interactive television experiments in the United States in the 1980s (at least such innovating experiments, which would then have been considered to be worth mentioning in the histories written). Also the evident decline of the overambitious Time Warner's Qube experiment could have been acting as a warning signal for the new testbeds planned and it could have made the operators at least hold down the budgets of these experiments. Lång (1997) confirms this tendency: "In the 1980s the stream was not positive for new interactive television experiments. Partly this was because of the failed Qube-experiment". The experiments done were mostly videogame-type solutions, such as PlayCable, which have very little to offer to interactive television journalism.

Obviously the results of those experiments which were done in the 1980s have not been very promising, since for example Blahut et al. (1995) have not included any experiments from the 1980s in their brief history on Interactive Television in the United States of America, published in the Proceedings of the IEEE, vol. 83. no 7, July 1995: instead an experiment operating in Montreal, Canada called Videoway is included. Because of its capability of expansion (also into the United States) and the modern technology used, the

experiment is described here in brief, despite its location outside of the United States. The Videoway system could as well fit into the category of the experiments of the 1990s, because its starting date was in 1989 and it was still operational in 1996.

Actually the only new, interactive experiment in the 1980s in the United States that is usually considered to be worth mentioning is the Viewtron system, a testbed that operates more as an electronic newspaper than a traditional interactive television program with moving images. Viewtron was not the only experiment in the field of teletext or videotex, but it was relatively the most successful. Despite the success of teletext-services in Europe, for example, similar kinds of experiments in the United States were not especially successful.

Edwards (1985) writes about teletext:

> Although American television networks did nothing with teletext through 1984 ... seven million Britons received much of their news and information and greeted the new year from two million teletext screens in 1985. In America, a few companies were developing videotex, but these were newspaper or other organizations unworried about the potential losses of TV ad revenue. (Edwards, 1985, p. 222)

About the future of the teletext innovation Kenneth Edwards was overly optimistic in the mid-1980s:

> No matter what you call it, a television or a newspaper or a magazine, or whether you spell it videotex or teletext, it is here to stay – the electronic delivery of news and information to your home or hotel room, with the option of talking back. And it's getting more exciting with every new wrinkle. (Edwards, 1985, p. 221)

In Interactive Media, Gayeski and Williams introduce a wide variety of solutions where videotex–systems could be used (in addition to Viewtron, they introduce two other magazine sponsored systems and five bank projects in different parts of the country) in sending "electronic mail", paying bills, downloading computer programs, reading current newspaper and magazine articles, ordering airline tickets, and keeping up–to–the–minute tabs on the stock market. (Gayeski & Williams, 1985, p. 45, & p. 56)

Sam Harsh (1996) of the University of Colorado states that there are actually two different technologies, teletext and videotex, which are often falsely mixed up. Quoting Spring (1996), Harsh wants to point out that teletext transmits one-way information "piggyback" to specially adapted television sets (in other words is a non-interactive system), whereas instead videotex is a two-way system using telephone lines, cables, or fiber optics connected to a television and allows the user to interact with the information. (Harsh, 1996)

Also Harsh (1996) mentions another similar kind of system to Viewtron (which is introduced next). This system, called StarText was made publicly available for computer owners around the same time as Viewtron, and it was still in use in 1993. According to Harsh, the technological revolution had an important role in Viewtron's failure and in StarText's success:

> The costs of a dedicated terminal or TV adapter, connect charges, the poor display quality and lack of standardization of different systems, all led the users to abandon videotex (Spring 1991, p. 41). But a more important factor had to do with the emergence of the personal computer, which had a wider variety of applications than a videotex terminal. A computer can be connected to a vast amount of sources with a comparatively inexpensive modem. (Harsh, 1996)

1. Viewtron by Knight-Ridder

The most important of the teletext experiments in the United States was a system called Viewtron, developed by Knight-Ridder Newspaper. The Viewtron system provided television viewers in the Miami, Florida area (paying a monthly fee of $39.95 in 1985) with news pages, information and "advanced shopping and merchandising innovations". The system was based on phone-connected videotex technology, which could offer "a limitless number of pages of information", unlike the broadcast teletext system (used for example in Europe) which was limited in number from 600 to 1,000 pages.

Despite all the excitement, the Viewtron system never expanded to the 18 new

markets planned and videotex or teletext never managed to accomplish the popularity of similar kinds of services offered in Europe. According to Harsh (1996), the commercial version of Viewtron came out in 1983 promising a penetration of 50 million households in 1990s: a penetration that would cause the demise of the printed newspaper. Two and a half years and 50 million dollars later Viewtron, known today as "the V–word" was scrapped, about the same time as affordable personal computers entered the market. (Harsh, 1996)

Eblen (1996) from the University of Kansas claims that there is a lesson to be learned in the Viewtron experiment, when entering the Internet age:

> Little more than decade after the fact, the current Internet mania ignores the important lessons of Knight-Ridder's flirtation with Viewtron in the early 1980s. The relatively few users who kept on using a service that was fully paid for -- hardware and software -- tended to use it for getting in contact with one another, not for news. (Eblen, 1996)

2. Videoway by Le Groupe Videotron

In Montreal, Canada, Le Groupe Videotron started developing a system called Videoway [2]–[4] in 1989. The company itself was founded as a private company in 1970s and in the beginning it served west Edmonton. By July 1995, the Videoway system had more than 250,000 subscribers in Montreal and in the United Kingdom (Blahut et al., 1995). According to the company's own information, by September 1996 in the area around Alberta alone there were about 145,000 subscribers and 200 employees. The system operates via standard cable television system and provides the consumer with a set-top-box. (Videotron Communications Ltd. [VTCL], 1996)

Blahut et al. (1995) describe the service offered to the consumer:

> The services supported by the basic system include captioning and subtitling, broadcast data information services, pay-per-view program descriptions, video games downloading, and one-way messaging. In addition, the system supports a form of live program interaction whereby the subscriber can individually

> choose one of four separate views or camera angles of the same event. This is accomplished using four channels of the CATV system with local switching in the STB. (Blahut et al., 1995, p. 1073)

As Blahut et al. note, the interesting aspect in the use of Videoway is that it can be expanded following the needs of the consumer: "The Videoway STB can be augmented with additional capabilities via add-on modules". To put it simply, Videoway can either offer a lower form of interactivity or have two-way capability, via cable or telephone line and offer pay-per-view or merchandise ordering and two-way messaging. (Blahut et al., 1995, p. 1073)

According to Lång (1997) the technical solution used by Videoway system is very simple and it is in fact based on regular broadcast television: Videoway system broadcasts basically the same program on four separate channels. The program on each of these four channels is edited differently, so the viewer can choose from four different "viewpoints" on basically the same program. (Lång, 1997)

The company itself describes the system in September 1996: "Videoway is an interactive home entertainment system that gives viewers control over what they want to watch and allows them to become an active participant in television programming." The system gives the viewer access to pay–per–view programming, premium television and superstations. Videoway also offers educational games and information services such as news and weather. The system also gives viewers: "...the choice of sending electronic mail greeting cards to another Videoway user". (VTCL, 1996)

The company also lists future innovations, such as Cable Internet ("available by fall 1996"), Internet access and data communications services ("available by late fall 1996"), and personal communication services, such as quality remote communications and data services. (VTCL, 1996).

Carey (1994) sees Videoway in an extremely positive light: "Videoway has a monthly charge of under $10, no hardware costs and interaction takes place on the TV screen. The service offers much original content, including daily interactive news programming, games and original programming for children."

IV. The current situation in interactive television in the United States

As Blahut et al. (1995) mention, there are some operational interactive television systems at the moment in North America (and also in Europe) offering services to consumers. Blahut et al. also mention that the opportunities within these systems are rather limited compared to the broad vision of interactive television, providing still "a range of services that have proven to be popular among subscribers". The number of experiments varies a great deal depending on the definitions of interactivity used, and depending on, for example, how long lasting the experiments have to be in order to be counted in (some last only for a few months). It also depends on how many users the systems have to have to have broader meaning (In Michigan there is an experiment in a library in the Upper Peninsula, the Lake Superior State University Library's interactive television system: it is without doubt a high quality experiment, but due to the small number of users it is insignificant on a large scale). On the other hand this conclusion may be totally wrong, since often the small, innovative experiments have proved to be the most interesting, but unfortunately too non-commercial to become economically viable.

In the United States there also operates an organisation for interactive television trials, Interactive Television Association (ITA), which in 1996 had 260 member companies. The large number of members can be explained with the loose definition of interactivity used in both, television and computer contexts. This organisation and its mission are introduced briefly after the description of the current experiments of interactive television in the United States.

A. Current interactive television experiments in the United States

Blahut et al. (1995) divide the interactive television systems into two different categories, into "Current Commercial Interactive Television Systems" and "Integrated Consumer Video Services Platforms". In the first category he includes Le Groupe Videotron's interactive system in Canada and the United Kingdom (described in the paragraph of the

experiments of 1980s) and GTE's Main Street -system operating in New England and in California. The second category includes "the latest generation of interactive consumer video service delivery systems", such as AT&T's Integrated Consumer Video Service and Time-Warner Full Service Network in Orlando (Florida). (Blahut et al., 1995, p. 1073)

The number of interactive television experiments operating at the moment varies all the way from Blahut's "some" to numerous, depending on the definition used and the experiments included in the "interactive" category. Krasilovsky (1996) introduces in his Interactive Television Testbeds 17 different testbeds for interactive television currently operating in the United States. As Krasilovsky mentions, most of the services are interactive only in the sense of offering movies-on-demand, but some of them use interactivity in a larger fields, such as education and health care. Somewhat surprisingly Krasilovsky finds more experiments from the telephone environment than from cable: eleven experiments use telephone technology and only six of them cable (telephone company entry to the interactive television industry is discussed further on in this study, in the paragraph VII B).

In addition to the experiments that Blahut et al. (1995) consider being the most important testbeds in the field (mentioned above), some trials from Krasilovsky's list are also introduced here. Pacific Bell's "California First" -plan is interesting if only because of its size. Another testbed considered worth taking a closer look at here is Time Warner's Test of Full Service Network: the testbed is planned to offer a large scale of services from educational programming to interactive games.

Two words defining the interactive trials are worth taking a closer look at before going further: *current* and *important*. Despite the fact that the documents have dated the starting dates for the experiments mentioned, the trials discussed here are current and on-going, which means that there may still be delays and cancellations. The introductions to the projects are based on the material available during the period the study was written. This aspect is especially important according to Lång (1997), who claims that most of the major interactive television experiments in the United States have been recently cut down. According to Lång, the business risk for operators at the moment is too high.

The other definition used when talking about interactive television experiments deals with the importance of the trials: the most important experiments for this research (especially of the latest trials) are the ones that offer more in programming than pure entertainment, like for example news and news-type programming.

Churchill (1996) has listed 21 Interactive television trials in the United States operating in 1996. The basic information about the trials in both lists, Churchill's and Krasilovsky's (1996) and is displayed in combination in Figure 2.

Interactive Television trials in the United States in 1996.

ACTV (INTV)	Westlake, California	Interactive Sports, news
Ameritech (ThinkLink) * testbeds also in Illinois and Wisconsin	Sterling Heights, Michigan	Educational videos for children
Bell Atlantic (FutureVision)	Dover Toms River & Union City, New Jersey	pay–per–view movies, (educational) Videos on Demand
Bell Atlantic (Stargazer) ** testbeds also in Madison, Florham Park, and Chatham Borough, New Jersey and in Alexandria, VA*	Fairfax & Arlington, VA	Video on Demand
Bell South (Interactice. Serv)	Atlanta, Georgia	Video on Demand (NVOD), transaction
Cox Cable	Omaha, NB	Video on Demand (NVOD), transaction
Discovery (Choice TV)	NA	TV on demand
GTE (Cerritos testbed) home	Cerritos, California	Video on Demand, video telephone service, shopping
GTE (Video dialtone)	Manassas, Virginia	home shopping, educational programming, Video on Demand
GTE (ADSL Test)	Dallas, Texas	Internet access
Interactive Systems (InTOUCH)	Portland, Oregon	Information, transaction
Interaxx (HomeStation)	Coral Sp, Florida	Multimedia, transactions
Intercast	Portland, Oregon	HTML capture
New York Telephone services	Manhattan, New York	information, entertainment, shopping
Pacific Bell (California First)	San Fransisco, Los Angeles, Orange County, and San Diego, California	full interactive television services including interactive news
Rochester Telephone		Video on Demand
SouthWest Bell	Richardson, Texas	Video on Demand, games
SNET	Hartford, CN	Near Video on Demand, pay–per–view
Source Media (Interact. Channel)	Denton, Texas	Transaction, information
Sprint	Wake Forest, North Carolina	Video on Demand, games
TCI (InfoStructure)	Pittsburgh, Miami, Denver ...	pay–per–view, Video on Demand
TCI/Microsoft	Redmond, WA	Video on Demand, games
Time Warner	Orlando, FL	Video on Demand, games, shopping
Time Warner (Quantum)		Video on Demand, games, shopping
US West (TeleChoice)	Omaha, Nebraska	pay–per–view, games
Viacom Cable	Castro Valley, California	Near Video on Demand, home shopping
ViewCall America	Atlanta, Georgia	Internet access, games
Your Choice TV (Comcast)	West Balm Beach	pay–per–view, Video on Demand

Figure 2. (summary from Krasilovsky, 1996, and Churchill, 1996)

The most interesting and successful experiments mentioned earlier that are still operational in the United States at the moment are introduced next.

1. GTE Main Street -system

Although, as already mentioned, most of the interactive television system ventures in the United States deal with cable television, it is important to notice that many cable solutions do not use the two-way capability of cable in delivering the upstream information from the consumer terminals to the headend. One of those services is operated by GTE, a phone operator in New England and California.

In January 1995, the GTE Main Street system had from 750 to 800 customers altogether in several CATV systems where the service was offered. GTE expected that "within 18 months the system would expand to serve between 6,000 and 10,000 customers" (Blahut et al, 1995, p. 1073)

Like most ITV systems, the system uses a special set-top-box (STB) with "a conventional TV-style remote control" connected to the customers' TV set. Data is delivered back to the headend via the telephone network, using the modem in the STB (in other words, when the viewer makes "an interactive choice", the box "makes a phonecall to the cable company").

To be strict about the definitions of interactive television, the GTE Main Street system does not, at least not yet, "fully implement the general model of interactive television". Still, as Blahut et al. (1995) mention, the GTE Main Street system has made a big step from traditional television towards actual interactivity: "Although it currently supports only still images, the system does create custom non-linear video programming, in real time, for individual subscribers in response to their commands. This capability is a significant step towards the ultimate vision of ITV" (p. 1073). In January 1995 GTE Main Street offered consumers stock market quotations, electronic check writing, access to on-line encyclopedias, news, games, and shopping.

Carey (1994) does not see the results of GTE Main Street as only positive. Carey, quoting articles in the Los Angeles Times (1993, Aug. 31, A1) and Wall Street Journal

(1993, Oct. 14, B1) writes about experiences of the use of Main Street:

> Overall usage of "Main Street" has been low; however, the project has generated some useful research findings. GTE found that while movies-on-demand are very attractive to consumers, they are willing to pay only a small increment ($1 extra) for a movie-on-demand over what they currently pay to rent a movie at a videocassette shop. Further, consumers balk at paying hundreds of dollars for an ITV set-top-box and would prefer to pay a small rental fee that is part of their cable bill. (Carey, 1994)

2. Pacific Bell's "California First" plan

Pacific Bell's plans in California would bring interactive television into the consumers homes without the atmosphere of a small audience testbed: in its full scale the California First plan would serve up to 5.5 million homes by the end of the decade. The construction started in 1994 and it is supposed to be finished by end of 1996. The first communities served are San Fransisco, Los Angeles, Orange County, and San Diego; communities that have in common high consumer demand, low deployment costs and competitive intensity. (Krasilovsky, 1996)

Pacific Bell has promised to bring to California "a full slate of interactive services", including movies-on-demand, time-shifted television, interactive news, tele-education, home shopping, video games, and electronic citizenship. The company has also published plans to develop "an interactive home improvement channel" and "access to community experts on a wide range of issues". (Krasilowsky, 1996)

3. Time Warner's Test of Full Service Network

Time Warner's new experiments are of course worth a closer look because of the company's earlier experience in the field of interactive television. After its Qube experiment, Time Warner has tested the wings of interactive television in Queens, New York, providing 10,000 people mostly near-video-on-demand services. The Full Service

Network is envisioned to take "several steps beyond" the Quantum system in New York. (Krasilovsky, 1996)

Full Service Network in Orlando, Florida, is supposed to bring such services as video-on-demand, educational resources, interactive video games, home shopping, personal communications services, and high speed data transmission. The set-top-boxes used in individual households are expected to provide on–screen information, high quality graphics and CD-quality sound. The technology is planned to be transmitted through a high-power digital converter box. (Krasilovsky, 1996)

Blahut et al. (1995) describe in Interactive Television Time Warner's Full Service Network to be similar to the AT&T's "Integrated Consumer Video Service Platform", which according to Blahut et al. represents "one of the latest generations of interactive consumer video services or platforms". The benefits of the system are that: "... this system is designed to offer a wide variety of different video services to consumers in their residences using a common communication infrastructure". (Blahut et al., 1995, p. 1074)

4. Interactive Network

Carey (1994) mentions a similar kind of interactive television system to the Canadian Videoway (introduced in the experiments of the 1980s) operating in California and Illinois, called Interactive Network. According to Carey:

> Interactive Network requires a special terminal costing a few hundred dollars and with high monthly charges. Interaction takes place not on the TV screen but on a small display attached to the terminal. Services consist of playing along with TV game shows and trying to anticipate the next play in sporting events, but there is no original content. Subscribers are few but reportedly quite enthusiastic. (Carey, 1994)

According to Lång (1997), the Interactive Network service might have been shut down recently because of new ownership arrangements ("it was not in bad condition economically").

B. The Interactive TV Association

The mission of the Interactive Television Association is stated as follows:

> The Interactive Television Association (ITA) provides its members with information about the interactive industry (including television, the Internet, and other interactive platforms); savings on conferences and research; activities with leadership councils; and support services ranging from speaking engagements and event attendance to exhibition schedules. ITA is a non-profit, Washington, DC -based trade association.
>
> (Interactive Television Association [ITA], 1996)

In 1995 the organization had 260 members. It publishes a weekly fax newsletter (ITA:/news), and provides the members with numerous benefits, such as conference discounts. The association also maintains industry-specific leadership councils dealing with industry related issues. The list of members includes the most important players in the interactive game, from both the television and computer industries (AT&T, Microsoft, TCI, The Walt Disney Company, Motorola, IBM, Sun Microsystems, America Online, Time Warner Full Service Network etc.) (ITA, 1996)

V. Interactive television programming in the United States

There has been much discussion of the content of the programming in interactive television experiments in the United States during the past twenty years. The programming in the earliest experiments, such as Time Warner's Qube experiment, was strongly innovative and the interactivity in those experiments was considered to be full of new possibilities, which had to be examined fully. After twenty years of experiments, interactivity today depends in most cases on video-on-demand and pay-per-view type solutions.

Carey (1994) argues, that possible success for interactive television is to be found in suitable content creation. Carey claims that interactive television needs "a killer application" to drive it finally into millions of homes. These "killer applications" have, according to Carey, throughout history helped in bringing new innovations into homes, such as HBO in expanding the cable in 1970s and the creation of a critical mass of content for compact disc players and VCRs. Possible "killer applications" for interactive television mentioned are movies-on-demand and interactive games.

Blahut et al. (1995) believe that interactive television content will most likely bear some similarity to computer and video games, and interactive multimedia applications, such as CD-ROM titles. Still Blahut et al. admit that the programming in interactive solutions may need to look more like standard broadcast television: "lively, video-heavy, and with high production values" (p. 1081).

Interactive Systems Inc. is, according to information provided by the company itself, "a leader in the emerging world of Interactive Television" (the company was founded in 1986 and is located in Beaverton, Oregon). The company has done research in developing different kinds of solutions in the field of interactive programming. The solutions presented by the company follow mostly the so-called traditional view on interactive television, where the viewer is considered to be a more active participant than the video-on-demand type solutions. The five programming categories possible in interactive television presented next are mostly based on Anderson's presentation on the solutions of the Interactive Systems Inc. (Anderson, 1994)

A. Sports programming

Blahut et al. (1995) give us a vision of the future of sports programming in the context of interactive television:

> For example, if the viewer were to choose a program reporting sports scores, he or she might also indicate that they wish to see those reports on the latest results in tennis and golf, but nothing on football. The selected score reports themselves will likely contain lots of moving images, compelling audio, high production values and visual effects commonly employed in standard TV programming. (Blahut et al., 1995, p. 1071)

Interactive Systems Inc. presents possibilities for example in trivia contests (posing interactive trivia questions throughout the game for increasing viewer interest), predicting the plays and today's winners (presenting and interactive list of possible actions), storing and forwarding (the set-top-box can store data for a viewer's game), and sponsoring (interactive sponsored announcements). (Anderson, 1994)

An interactive solution which is perhaps even more interesting than any of the ones mentioned above became available in Germany during the year 1996. A German operator, Kirch, started broadcasting Formula One Grand Prixs interactively, so the households equipped with a multimedia terminal (a set-top-box) could choose from five different camera angles as they desired. (Niskala, 1996, Feb. 25)

B. News and news type programming

Blahut et al's (1995) vision of interactivity in sports programming introduced above is easily adapted also to news programming (even though Blahut et al. do not seem to have much faith in interactive television's possibilities in news programming or providing information overall – Donald E. Blahut has a B.S. degree in electrical engineering and he works as a Development Manager in interactive television at AT&T Bell Laboratories). With interactive technology it is easy to take into account for example the viewers special interest fields, such as international news or business news.

According to Interactive Systems Inc., interactive television technology could be useful in news type programming in the forms of opinion polling, printed information, and direct response requests, to mention just a few. (Anderson, 1994)

According to Interactive Systems Inc., with the offered interactive capability in opinion polling, viewers could express their opinions on matters of interest presented on the program ("without having to go to the telephone"). The poll question could be either presented to all the viewers or just to the viewers using an interactive home-terminal.

One of the most interesting aspects of interactivity in news programming, according to Anderson (1994), is the capability to print information:

> The categories of printed information spans the scope of information presented by television news and talk programming itself. Examples: more in–depth coverage of news; names, addresses and phone numbers to contact; traffic reports; weather reports; tips and tricks shown on the program; statistics presented on the show; and much more. (Anderson, 1994)

Other useful interactive solutions in news programming, according to Interactive Solutions Inc., could be direct response requests (where the viewer could for example request newsletters, fact sheets or other printed material, later delivered via mail), story ratings (to get feedback on news stories or discussion topics), viewer's ability to purchase transcript or videotape of the show, vote on next week's topic and vote on the direction of a live show. Anderson (1994) describes the possibilities of the use of audience response in the programming process: "Reactions from interactive viewers can be gathered and reported back to the producer of a live show in just a few minutes. The producer can then change the direction of the show, or have results reported live on the show and incorporated into the on-air discussion."

C. Drama, serial and movie programming

Interactive Systems Inc. has developed five different solutions using interactive technology in drama, serial and movie programming. In mysteries, courtroom dramas, and detective shows the viewer could interactively take part by trying to predict the plot.

By footnoting, dramas requiring historical or scientific knowledge could become even more interesting and the information could be either printed out or presented in the lower portion of the screen. Summaries of the previous episodes could be presented and printed. Movie synopsis and cast list could be printed. Also a brief trivia quiz could enhance viewer interest in a movie. (Anderson, 1994)

D. TV Game Shows

As already mentioned, entertainment has had a strong role in interactive television experiments in the United States for the past twenty years. Interactive Systems sees such solutions as Quiz Shows, Guess-the-Prize shows and Wheel of Fortune in the interactive television of the future. According to the company, the viewers could play along with fast-paced quiz shows, and also the already existing shows, Guess-the-Prize and Wheel of Fortune could benefit from interactive technology. One aspect of interactivity in game shows is the viewer's possibility to compete against other interactive show viewers. (Anderson, 1994)

E. Home shopping programming

Keeping in mind the commercial environment of the interactive television experiments in the United States, it is not hard to guess that home shopping is one of the segments of programming that has been under exceptional development. In interactive shopping the most interesting aspect, compared to the traditional television shopping, is the possibility of viewer identification and targeted shopping channels. After the viewer has for example entered his personal PIN-code, the program "knows" which products to offer to the consumer by the fields of interest defined beforehand. Interactive television solutions can also provide the consumer with interactive infomercials, storing and forwarding services, sales tax calculation programs (in the United States the sales tax is not included to the price of a product), and credit card options. (Anderson, 1994)

VI. Journalism in the interactive television in the United States

Despite the fact that entertainment usually seems be the driving force in discussions about interactive television in the Unites States, there are recent signs which imply that there is still room for delivering information, news, documentary and also room for journalism. The recent success of Cable News Network (CNN and the whole "family" of Turner-news-channels, from Headline News to CNN International) and the audience's interest towards such reality-based channels as Discovery and History Channel are clear indicators of the American TV-audience wanting an alternative to the soap operas and sitcoms. It is important to notice that programming in such channels as Discovery, is based on reality and follows quite far the concept of "the traditional" documentary, and still can be highly entertaining. This new kind of documentary has in fact formed a new category in programming: a category of edutainment (Tenerelli, 1996). d'Agostino (1995) shares this opinion of growing reality-based programming: "... through talk shows, tabloid news magazine formats, and the docudrama-styled movies of the week" (p. 271).

A. The audience's role in interactive television journalism

Broadcast television in the United States deals in a commercial environment, which, of course, has its influence on the whole industry of programming and as a result on the wishes or at least viewing habits of the television viewers (one can argue that there is no real "consumer sovereignty": consumers are actually not able to choose the kind of programming that they would want to watch; they only have the choice within the options offered).

Blahut et al. (1995) state about the American television viewers: "Consumers approach their TVs expecting to be entertained. Their standards for the quality of this experience have been steadily rising, driven by the growing sophistication of programming from the conventional TV production community". Despite "the growing sophistication", whatever it means in practice, Blahut et al. interestingly want to point out the differences

in the use of television and computer:

> Interestingly, consumers tend to approach their computers expecting an experience which is more informational than entertaining. For example, the static displays typical of computing applications would be viewed as interactive content for TV delivery will require talent familiar with conventional entertainment production to supplement traditional computer software development skills. (Blahut et al., 1995, p. 1071)

At least for me, as a television journalist, to put it as strong as possible, Blahut (et al)'s words indicate that he is ready to move the task of delivering information (news, news magazines and documentaries, just to mention a few) from broadcast and cable television to computers and to turn television from the source of news and documentary to a true "vast wasteland", pure provider of entertainment. Luckily, at least from the journalistic point of view, not all experts are as pessimistic.

As for news programming versus entertainment, Dealing in the Dark: Television in the 90s writes: "Each year the networks [NBC, ABC and CBS] invest $850 Million in News coverage and programming ... Since the 1980s NBC alone has cumulatively lost almost $450 Million on its News operations" (Lauer, Murray & Saver, 1991, p. 28). As these figures indicate, for the broadcasting networks news work is not profitable, but it is still highly respected and year after year the networks invest a lot of money in it. Reliable and effective news coverage is good publicity for a network. It can be predicted that the same kind of PR-value which news programming enjoys will also be seen in the interactive television solutions, at the latest when the services come largely available.

Some proof of the customer desire for news programming also in an interactive environment is found in a survey conducted by Lou Harris and Associates in 1994. According to the customer response in the study done, nearly 75 percent of the television audience would like to receive a customized news report and over 60 percent of the respondents would like to use their television (or PC) in receiving health care information. The figures are interestingly high, especially when compared to the 40 percent who show interest in movies on demand and 30 percent for interactive home shopping services in the same study. (CITV, 1996)

d'Agostino (1995) claims that the pioneer experiment in the field of interactive television in the Unites States, Time Warner's Qube system, fell into the trap of commercialism, into the reality of the American system. In the beginning: "the viewer could participate by expressing his or her preference and interest in products, programs or argued positions" (p. 238). But after the much-publicized start when the first wave of excitement had waned, the company changed its focus from pioneering interaction into expanding its cable distribution. According to d'Agostino, the Qube system concentrated more on monitoring the audience, and not at all on finding out what products the viewers preferred to buy.

It may be true that the American television audience approaches television mainly as a means of entertainment, but history seems to show that, despite twenty years of experiments in interactive television, the audience has not been given many choices. After all it seems that for example, "the great journalistic" questions presented by the Qube system seem to fall into the same category as the following example presented by Advertising Age -magazine on the 6th of December, 1982: "In local programming the town residents can ask for help in their personal problems: During a Columbus show called 'Someone wants to Know' a woman asked viewers to help her decide which dress to wear in her daughter's wedding."

According to d'Agostino (1995), the audience's role in interactive television journalism has been and still is rather marginal:

> Though interactive channels on some level acknowledge the individual's existence, that individual identity remains submerged beneath a stifling surface and statistical generalizations fortify the anonymity of the individual while building the myth of consensus in an increasingly homogenized audience. (d'Agostino, 1995, p. 239)

B. The journalist in interactive television

Despite the 20 year long experience with interactive television experiments in the United States, there is very little written about the work of journalists in those interactive mediums. As already mentioned, one of the reasons is without a doubt, the fact that interactive television experiments, like almost the whole field of television in the United States, operates within a commercial context. Also interactive television is meant to be profitable, which means programming that attracts large audiences and a large number of subscribers.

Professor Joe Duncan (1996) from Indiana State University's Television Department points out that television in the United States is in the first place a consumer driven industry. To stay in business all interactive television experiments must create consumer demand. From Duncan's point of view the only interactive television experiment that has had enough connection with a work of the broadcast journalist has been Time Warner's Qube -system (introduced in the chapter III). According to Duncan, Qube had a joint venture with Ohio University, which also produced public affairs programming. In news work the Qube-experiment proved, according to Duncan that the intended strengths of interactive television – opportunities for instant polling and voting – in fact have less meaning than was expected. This is in fact not so much due to interactive technology itself. Duncan says: it is rather connected to the basic characteristics of audience responding to television programming. According to Duncan; "The grinders are the ones that call in", meaning that the ones that react to instant polling have to have a strong (usually negative) opinion on the discussed matter in order to get the impulse to give a vote. Still Duncan admits that the interactive television experiments have done their share in defining the kind of journalists the televisions of the future will need. In Duncan's television of the future, which is increasingly in constant interaction with the consumer, the journalists have to be more and more educated. Duncan points out that society is becoming more complex, thus requiring specialized-area journalists with detailed knowledge in the field they work on.

Kari-Hans Kommonen (1997), a researcher at the University of Art and Design,

Helsinki, claims that the failure of most of the interactive television experiments is an indication of major problems in programming content. The companies have falsely assumed that the same kind of broadcasting as in television programming can be adapted to interactive television. Kommonen states that a whole new idea of television content has to be created: polling-solutions and video-on-demand are not the kind of solutions the audience wants. People want to interact with other people, not with products (news-on-demand is also considered as a product). Of the journalism in interactive television Kommonen claims: "The failure of the trials is also an indication of the lack of journalistic work done. In the future the journalists will provide additional information for broadcasting-type news from their own servers. The audience will decide which journalist's server they want to use to get their information. With this service the news can be for example localized or adapted to match individual areas of interest."

One indication of lack of journalistic effort put into interactive television research and the experiments done can be seen in the fact that in the seminar on interactive television held in the University of Edinburgh, Scotland, in September 1996 ("ITV'96 – The Superhighway Through the Home?") there were no journalists present – just fiction writers and technicians. (Kommonen, 1997)

VII. Latest trends in interactive television in the United States

Most of the interactive television systems operational in the United States of America today offer video-on-demand services. It can be questioned, if video-on-demand should really be considered interactive television: after all video-on-demand is in fact just a videorecorder despite its distant location.

A matter also widely speculated in the field of interactive television is the entry of the telephone companies into the business. The new Telecommunications Act of 1996 passed by the United States congress is seen by some experts as the final stamp on the envelope of interactive television. Many experts are not as optimistic: television viewers waiting for interactive solutions may have to wait until the entire distribution channel is digitalized.

A. Video-on-demand services as the future for interactive television

As already mentioned, many interactive television look-alike-solutions, such as video-on-demand and pay-per-view services, seem to be the controlling interest for the interactive television "game players", the companies developing the technology and program content at the moment. Krasilovsky (1996) introduces in his working paper on Interactive Television Testbeds 17 current telephone company and cable operator experiments, which mainly concentrate on video-on-demand. These experiments provide movies and in some cases also broadcast programming from the past 24 hours (now to be watched any time the viewer wants to, so also the concept of "prime time" looses its importance). Obviously these companies seem to have lost their interest in developing "real", original interactive programming, where the viewer would have "more control over his or her television set" than by using the play, stop, rewind and forward buttons (which existed anyway in home-VCRs before the video-on-demand controllers).

Loughery (1991) writes about the future of television programming in Dealing in the Dark: Television in the 90s :

> We have identified the various distribution windows. We have seen the fragmentation of these audiences into much smaller audience pools. ... Be prepared for the Studios to focus primarily on the Pay Television opportunities and the advertisers to focus on Free and Subscriber-Enhanced Television as the inevitable sharing of available audience becomes an economic necessity in financing original television programming. Look for DBS [Direct Broadcast Satellite] and its potential for being the largest and most efficient television delivery system to act as a catalyst or currency exchanger in the future. DBS programming delivery with localized fiber-optic advertiser support services (much like direct-mailer marketing) will have the capacity to effectively package together all the current technological conflicting audience systems back into a massive audience delivery system by the mid-90s. (Loughery, 1991, pp. 7–8)

All the experts are not as positive as Loughery about the importance of video-on-demand services. Kommonen (1997) claims that video-on-demand solutions only offer different kinds of edits on the same material and therefore are not really interesting (Kommonen calls the interactivity of video-on-demand solutions "false interactivity").

B. Telephone company entry to interactive television

The Telecommunications Law 1996 passed by US Congress, gives the telephone companies an entrance to the cable television business. Stern (1996) writes about the new law and telephone entry into cable:

> Repeals statutory ban against telcos' providing video programming in their own service areas. Telcos may choose to be regulated as cable system, common carrier or newly created "open video system". As an operator of an open video system, a telco must make channel capacity available to unaffiliated programmers without discrimination ... However, they are not subject to other federal cable regulations and need not obtain local franchise. (Stern, 1996, p. 9)

According to Hackenberg (1995), this telephone company entry means, finally

"after twenty years of starts and stops, and at least two years of hype and delays" the start of serious testing of interactive television. "Now, when the major telephone operators enter the marketplace, it will engage the cable companies in the battle for telecommunications access to US households", Hackenberg writes (p. 1).

Almost all of the Regional Bell Operating Companies, the RBOCs, have announced interactive television trials and many have received FCC approval for their ITV test plans. Many operators, such as Ameritech, AT&T, Bell Atlantic, Bell South, GTE, NYNEX, Pac Tel, SBC and US West, are forming new alliances to deliver new media programming. Hackenberg (1995) points out that until now ITV in the United States has mainly been delivered via cable, based on foreign experience (such as Videoway, Montreal, Canada) and at lower levels of interactivity. Based on the opinions of CEOs in cable and telephone businesses, Hackenberg is convinced that interactive television is the driving force of telephone companies entry to the cable business (Bell Atlantic CEO Ray Smith believes that the telephone companies will take 50 % of the cable TV business).
(Hackenberg, 1995, pp. 1–4.)

Not all of the experts on the matter are as positive as Hackenberg. Johnson (1994) claims, that although much emphasis has been placed on the telephone companies as the hosts of interactive services, the future is questionable, for three reasons: the cable companies are ahead as deliverers of interactive services via cable, the cable companies are can respond more quickly to the customers needs and lastly, both the cable companies and telephone companies will face competition from nonwireline providers of interactive services (such as Interactive Video and Data Services, IVDS). (Johnson, 1994, pp. 45–47.)

C. The television industry getting ready for digital television entry

Many experts see the future of television in the United States as strongly connected with the move from analog television signals to digital. In "Televisions of Tomorrow" session of the Industry Summit held in September of 1993, Andrew B. Lippman, associate director of the Media Lab, predicted that this move from analog to digital would take place within five years, which would mean that in 1998 the television signals in the United States

would routinely be distributed digitally. The switch to digital would, according to Lippman, make television sets more intelligent, providing interactivity and viewers personalization. In the same seminar Alfred C. Sikes, the president of Technology Group of the Heart Corporation, saw that along with digitalization television will become a forum of social interaction: "All of the things that can be done gregariously will be done interactively" (Kelly, 1995, Mar. 13).

Raimo Lång (1997) of University of Art and Design, Helsinki, claims that all the major operators in the field of interactive television have recently been postponing the new trials because large investments in the current analog technology are too risky. Lång states that interactive television has to wait until the whole television signal distribution system from headend to individual television sets is fully digitalized.

VIII. Future visions of interactive television in the United States

A tremendous number of visions of the future have been presented during the twenty or so years that interactive television has been the subject of discussions. In 1977 when Warner Amex introduced the Qube system it was claimed to be something that would change the world; the advertisement said: "Touch the button now, and someday you'll tell your granddaughter about it". After five years of Qube programming the operators believed that they had only "scratched the surface of what interactive technology could offer", despite the fact that Qube already allowed interactive programming, including entertainment and pay-per-view sport specials, shop-at-home services, home banking, data retrieval, instant audience polling, educational courses and local origination shows. (Reiss, 1982, Dec. 6)

Anderson (1994) writes about the future of interactivity:

> As interactive television progresses, imagine being able to 'tune-in' to special channels where viewers from different parts of the country play together in a huge fantasy game or sit around a table playing a game of blackjack. Or consider the case where a movie or soap opera stops the action at a key point and then allows the viewers to determine the direction the program will head. Looking five to ten years out into the future brings video-on-demand (VOD) which will allow the viewer to choose what they want to watch whenever they want to watch it. (Anderson, 1994)

From the journalistic point of view it is interesting to note that in Anderson's vision all four examples (excluding perhaps the last sentence of the quote) deal with pure entertainment. He does not even mention the growing section of the so-called infotainment, nor talk about dealing with "hard" information, meaning news, documentary etc.

According to Anderson (1994) the television viewers of tomorrow will, with interactive television, become immersed in the program by participating "as if they were actually on the show". Anderson sees also a whole new type of programming which will

take advantage of added interactivity (unfortunately, he does not tell what it will be like). According to Anderson: "Entertainment will be taken to another level and when all is said and done, interactive television will surpass all previous advances in the history of TV as the most important".

Even experts in the field of television are not all so convinced about the speed at which interactive technology will have to overcome the traditional television. Alan Bell of Freedom Communications sees that "audiences for interactivity or home shopping are enormously tiny". Bell compares the relationship with interactive television and traditional television to the relationship between television and radio or radio and newspapers. According to Bell: "The new supplements the old, it doesn't supplant it". KRON's Amy McCombs sees interactivity as "a buzzword". According to McComb the Americans already have interactivity over the telephone. "We need to learn a lot more about what the consumer is interested in... people don't want to punch up a lot of numbers", McComb claims. (Kelly, 1995, Mar. 13)

Television critic and journalist Les Brown claims about the television of the future: "The future of television lies in its role in the community, its importance as a public service. Broadcast TV is going to be preserved and protected by the government because of its importance as a force that unites the country. There will always be lanes on the information highway for broadcast television." (Kelly, 1995, Mar. 13)

A. Bill Gates' vision of the television of the future – "The Road Ahead"

In the bestseller book and CD-ROM -combination "The Road Ahead" Gates, Myhrvold, and Rinearson (1995) (Bill Gates is the CEO of Microsoft Corporation, a major player in the computer industry) discuss two journeys, revolutions, in the world of computing and telecommunications overall: one which has already taken place and the other soon to come. Gates et al.'s view is that the first revolution was the personal-computer revolution which influenced the lives of millions. According to Gates et al., we are all in the beginning of another great journey: a journey which will provide us with a new way of communicating which each other. The next journey into the so-called information

highway will provide us with an endless stream of newspaper and magazine articles, television and radio broadcasts, conferences etc. What the information highway will not be, according to Gates et al., is today's Internet or the delivery of 500 simultaneous channels of television. (Gates et al., 1995, pp. xi–xii)

Gates et al. call the television of today, the conventional television, "a synchronous" device: it allows the viewers to decide what they want to watch but not when they want to watch it. The early 1980s gave the viewers more flexibility in the form of the videocassette recorder. Gates et al. see that the success of the VCR is one indication of man's will to convert the synchronous communication sessions into more convenient ones: "asynchronous' communication sessions, where the viewer, or the user of the media (no matter what it is like) can also choose the most convenient time for media usage. The future will change all the manual, analog hassle with tapes into an "asynchronous", digital form of media usage. (Gates et al., 1995, pp. 65–66)

According to Gates et al., video-on-demand will be an important application on the information highway. Gates et al. describe the future: "We already know that PCs will be connected long before television sets and that the quality of movies shown in the early systems will not be very high. The systems will be able to offer other applications such as games, electronic mail, and home banking". According to Gates et al., the television will continue broadcasting shows as today, but the difference will be that after airing these shows will be available to the consumers whenever they want to view them. This all will be possible via "servers', computers with capacious disks, where the television shows will be stored and made available for future use. Also pausing and rewinding a live show will be possible by using a personal remote control, but one limitation remains: the viewer is still, of course, unable to forward a live show. (Gates et al., 1995, pp. 67–68)

The television sets of the future will not look like computers, according to Gates et al. The sets won't have a keyboard, but the additional electronic components inside the sets will make them basically similar kinds of devices to the PCs of today. They will be connected to the information highway with similar kinds of set-top-boxes to the ones used nowadays by most cable companies in the US: the difference will be that these boxes will include a very powerful general-purpose computer (and it can be located also

inside or behind the television or even outside the house). This box will connect both, the set-top-box and the PC to the information highway and allow "a dialogue" with the switches and servers of the network, making it possible to retrieve information and programming and relay the subscribers choices. (Gates et al., 1995, p. 70)

According to Gates et al., homes of the future will not have one combined television and computer: the small screen PCs and big-screen televisions will remain separate (although they are in fact connected to same the system). The future set-top-boxes will be designed so that even the oldest television sets and the new computers can all be connected to the information highway, but there will be new equipment with better picture quality. Also the telephones of the future will be connected to the same networks as TVs and PCs. (Gates et al., 1995, p. 70)

B. Peter d'Agostino's vision of the post-television culture

According to d'Agostino (1995):

> Though it presents a form of hyperreality that can reverse classic territorial relationships, television is an analog medium wedded to the possibilities and constraints of the late twentieth century. When the transmission lines were unplugged during the 1989 democracy movement uprising in Beijing's Tiananmen Square, the resulting television snow became a lasting example of the one–way flow of information. Although two-way interactive television has been technically feasible from the beginning of television's invention, it has only been employed on a limited basis. New models for transmission and reception are needed. (d'Agostino, 1995, p. 271)

d'Agostino states that the experiments done with interactive television in the United States of America, such as the Qube experiment, have not moved forward, in fact the contrary has happened: d'Aqostino claims that these experiments, including also the recent systems: "... lead way back to TV's primary modus operandi: developing more efficient ways of delivering consumers to commercial products and services" (d'Agostino, 1995, p. 273).

d'Agostino (1995) points out that:

> To move toward a post-television era, it is important to bring the term *interactivity* into sharper focus. Gregory Bateson's (1979) conceptualization that "information consists of differences that make a difference" (p. 99) can begin to provide a basis for this pursuit. One of the "differences" here is that, beyond the immediacy of the senses, a new and remarkable set of circumstances has begun to chance the paradigm of human interaction. Within artificially constructed realities, ones that the computer interface are making available for the first time, a cyberspace of globally interconnected networks is beginning to offer myriad possibilities for communication. How we interact through these systems begins to shape the prevailing values of a post-television culture.
>
> (d'Agostino, 1995, p. 281)

d'Aqostino's text can without a doubt be understood in numerous different ways but it is clearly seen that he requires a lot more from the interactive television services than they have offered so far. Perhaps the Internet offers much more the kind of interaction that d'Agostino wants than the interactive television solutions available today.

IX. Finnish interactive television experiments

As already mentioned, this chapter is included in the study to give a Finnish perspective especially for a Finnish reader. In Finland television operates on entirely different grounds than in the United States of America.

At the moment there are two governmentally owned channels, and in addition one commercial channel, MTV3. A fourth channel, also a commercial one, starts broadcasting in the fall of 1997. The low number of channels, the small television audience (population of 5.1 million in 1996) and the govermentally regulated system have of course also kept down the number of interactive television experiments. Dellinger (1995) writes: "... broadcasting is still considered a public institution in Finland, and television is responsible to the Ministry of Transport and the Finnish parliament, the *Eduskunta.* In keeping with the tradition of public broadcasting in Europe, the ministry distributes broadcast channels in such a way that specialized tastes and needs will be met" (p. 28).

The first Finnish interactive television experiment was developed by Helsingin Puhelinyhdistys (HPY) as a part of an European Comission Research Project. Via telephone lines additional television services were available to viewers in Lauttasaari, Helsinki area, starting the summer of 1995. A brochure about the trial states: "Families taking part in the field can use remote control and screen menu facilities to select video programs, which are then transmitted to the television set via the telephone line. Viewers can rewind or stop the video in exactly the same way as a normal video cassette." (Helsinki Telephone Company, 1995) As can be read, the service offered film, music video and news (the news was edited to fit the interactive environment from the state-owned Yleisradio's channel 1 news) as a full video-on-demand service, but no original interactive television programming content. The viewers were reported to be fairly interested in the video-on-demand, also in the news service. The experiment ended in March 1996, when the EU funding for the trial was cut down. At the moment (1997) HPY is experimenting with interactive television in the cable environment in Pasila, Helsinki.

Another Finnish phone operator, Tele, has announced that it will begin testing with its interactive television system, Omavisio, in the spring of 1997. Tele's brochure states

about the trial: "In the Omavisio concept, users can order various multimedia services, such as news and purchasing services, games, and videos, from a digital server, using a set–top–box attached to an ordinary television. The television can also be used as a high–speed access path to the Internet and its innumerable services" (Telecom Finland Oy, 1996).

In the early platforms the Omavisio experiment used the news service from the Finnish commercial channel, MTV3. No original interactive programming was created in the early demos.

CONCLUSION

In the mid 1990s it seems that interactive television as it was designed in the 1970s will never become reality in individual homes in the United States of America or anywhere else on this planet. As Gates et al (1995) and other experts in the field observe, digital television, the Internet and its successors and the information superhighway are soon going to change the course of television broadcasting. Interactivity will be reality during the viewer's usage of television, but more in the form of individual choices which will affect the programming seen in the individual consumers terminal and not in the sense of receiving all terminals collectively. Or, on the other hand, that may not be the case after all. Carey (1994), an expert who has been following interactive television from the 1950s says: "The smartest thing you can say is: I don't know. I know where it is now, but I don't know the future".

The trend of today seems to be rather further away from Marshall McLuhan's "global village" than towards it. While the interactive television systems of the 1970s in the United States desired collective sessions of media usage, where each television viewer had his chance to influence the course of the program, everyone could do his part in polling and the results were displayed in all sets "participating", today interactivity is aimed almost entirely at video-on-demand. The viewers will no longer be a huge collective mass watching the same "window on the world" at the same time; previous broadcasting audiences will view the programs at different times. Also a trend from broadcasting via narrowcasting (for example special sports channels) all the way to slivercasting (special channels for motor sports or even Formula 1) is emerging, especially in the cable systems in the United States: already the friends of golf can watch their own channel as well as those viewers who enjoy playing interactive games via television. At the same time the world is a "global village" watching CNN (especially in times of crisis), and a segmented audience watching and using thousands of different forms of electronic media at the same time.

Even though interactive television as it was planned at the desks of the architects of

the Qube system will never become true, we are inevitably moving rapidly towards "viewers greater control over their television programming". And not only television, as Gates et al. (1995) describe, soon all information, from newspaper articles to radio and internet, will be in the future available via a huge, international network available to millions: the information superhighway. But when the amount of information available to the individuals using the home terminals grows to be basically limitless, the task of journalists will become more and more challenging.

As Kari–Hans Kommonen (1997) of the University of Arts and Design, Helsinki, observes the lack of original interactive programming has in many ITV trials led to the downfall of the system. In many trials news-type programming intelligently using the possibilities of interactive technology may have saved the system. Kommonen sees that the Internet is already today an environment which works as an interactive system should: it is individualized (bookmarks), personalized (people can create homepages of their own) and it is not chained to the linear format (hypertextual links).

The television industry seems to be totally forgetting the possibilities of two-way capability in collecting information from the viewers. In the fuss of video-on-demand it is more important, mostly for economical reasons, to get viewers to subscribe new movies than ask their opinions on presidential candidates for news usage. Still I believe that when the viewers are connected to the new, two-way television, the operators and the whole industry will soon realize the possibilities that the new technology provides in news-type and reality based programming. It is not unrealistic to assume that before long, the same type of audience-polling and viewer-voting for program content as in the visions of the architects of Qube could be reality. All this requires journalistic skill and knowledge of the possibilities of the new media: know-how from the journalists working in television inside the information superhighway.

On the basis of this study it is legitimate to state that interactive television in the United States of America has not become economically viable because of lack of original interactive programming, including journalistic work, such as news and documentary. This is a lesson to remember when the television industry, journalists included, prepare for the digital, two-way television of tomorrow.

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GLOSSARY OF TERMS RELATED TO INTERACTIVE TELEVISION

C

converter – a handheld or set–top device used by subscribers for channel selection, or at more advanced level (as in the case of pay–per–view).

D

downstream – the direction in which a signal travels from the headend to subscribers (compare with upstream).

F

fiber optics – a communications transmission medium that carries video or data signals in the form of light pulses over thin glass fibers. Fiber optic systems provide great bandwidth capacity using fewer and smaller cables.

H

headend – the operations center of a cable system. Receives, amplifies and converts incoming broadcast and locally–originated signals and redistributes them to subscribers.

home shopping – a program format which permits subscribers to request products and/or services they view on their television screens. Orders may be placed by telephone or, in more advanced cable systems, by using an interactive converter or a personal computer connected to the cable line.

I

interactive cable – strictly defined, a two–way cable application whereby signals flowing between the headend and distinct receiving points affect each other simultaneously; communications between two parties or electronic devices over the cable transmission path.

P

pay–per–view – a cable service that permits subscribers to select programming on a per–event basis. Selections may be ordered by telephone or, in more advanced systems, by means of an interactive converter.

polling – permits subscribers to respond, via interactive converters, to information presented on their TV screens. Subscriber responses are transmitted upstream to the headend, where a computer records them and transmits the results downstream.

Q

QUBE – interactive cable technology developed by Warner Amex Cable Communications. Qube applications include pay–per–view, polling, home security, home shopping, and information retrieval.

T

teletext – one–way transmission of alphanumeric information via the vertical blanking interval of the broadcast television signal.

two–way cable – refers to cable systems which possess the ability to carry a signal or signals from some remote point or points to the headend, as well as from the headend to cabled buildings.

U

upstream – refers to the direction in which a signal travels from subscribers to the headend. (compare with downstream)

V

videotex – two–way distribution of alphanumeric information via telephone or cable lines. Videotex applications include home banking, home shopping,and information retrieval. Users interact with service providers by means of personal computers, handheld keypads or communicating word processors.

(summary of terms in The Interactive Cable TV Handbook – Fourth Edition, 1984)