HI-OVIS IN NEW MEDIA ERA

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ABSTRACT

Tremendous amounts of effort have been made in developing information systems that play an essential role in supporting an information-oriented society, and the use of such systems has become quite common for the general public today. We already enjoy various advantages from some of the more general, public systems in our daily life, such as seat reservation systems for public transportation, automatic ticket issuing, examining and collecting systems, cash dispensing systems at banks, and stock information systems.

Conventionally, there have been two types of information media in our daily life; mass media, such as newspapers, magazines, radio and television, and more personal media, as represented by telephones and letters. However, as a result of remarkable progress in modern technologies such as data processing, telecommunications (especially fiber optics and satellite telecommunications), and image technologies (such as video disks), new types of communication media have been developed and ways to put them to actual use are being studied from extremely realistic perspectives.

This report concerns the current status of Hi-OVIS (Highly Interactive Optical Visual Information System) which has played a leading role in the development of information service systems in Japan, and studies being made regarding its new role in the new media era, as well as future plans for further development.

1. PROJECT PHASE I (1972 - 1982)

1-1 Development schedule

Studies for this project were launched about 1972, and we began to draw up plans for the project in 1976.

Plans were formed on the basis of the most advanced technologies then available and revolutionary concepts, and we began providing services in July, 1976.

Hardware technologies have made significant progress since then, but the design concepts and functions of our system are still unmatched today by anyone else. We are making the most advanced experiments in our project, which is capturing the attention of many people as we enter a new media era.

1-2 System design concept

According to the objectives determined for Hi-OVIS development, there are three features that this system must provide, as summarized below, with respect to information to be handled in such a system;

1) The flow of information under this system must not be restricted to one direction (from the sender to the receiver). Instead, it should be bidirectional, going back and forth between the sender and the receiver.
2) The source of information should be such that the receiver can choose the particular information he wishes to receive.
3) Information must be in different forms, such as voice, data, images, etc.

This system is quite unique in three particular aspects.

1) It employs fiber optic transmission technology on a large scale.
2) It is an individual distributing system with subcenters between the center and individual subscriber monitors.
3) It is a two-way transmission system containing a TV receiver, camera, microphone and keyboard installed in each subscriber's home as well.

These unique features make it possible, unlike other information systems, to provide various types of programs for the subscribers and also to make such programs with the monitors.

1-3 System configuration

A basic system configuration comprises a center, sub-centers and home terminals connected to each other via fiber optic transmission lines, as shown in Fig. 1. Typically, instruction data is transmitted from the keyboard of a subscriber's home terminal unit on the upstream lines to a sub-center, specifying a specific program of particular interest that the subscriber wishes to receive at home. A video switch in the sub-center is turned on while it is communicating with the center to establish a line between the center and the subscriber's home terminal. The center then interprets the instruction data and controls a particular information source that has a program such as requested, and the program is sent to the subscriber requesting the program.

The number of sub-centers varies according to the need of individual subscribers. In an experimental system currently installed in Higashi Ikoma, sub-centers are located within the center building since subscriber homes are distributed within the vicinity. The scheme of the experimental system is shown in Fig. 2.

1-4 History of software development

The Hi-OVIS contains 29 service channels as listed in the table I

In planning programs and information services within the software availability shown above, experimental operation for Phase I was carried out in four developmental stages.

Stage 1 (July, 1978 - June, 1979)

The primary purpose of Stage 1 was to establish a firm foundation for the experimental operation itself.

Stage 2 (July - September, 1979)

System functions, especially the two-way transmission function, were studied from various angles.

Stage 3 (October, 1979 - March, 1980)

Efforts during this period of development were focused on system applications, especially on how to invite local residents to participate in the operation of the system.

Stage 4 (April, 1980 - March, 1983)

The following program development was made during this period, in order to pursue the commercial possibilities of the Hi-OVIS project.

- Programs for Pay TV such as educational programs and movies.

- Time Leasing. In this service, known as Info-mercial Program Service, time was leased in blocks of one hour at a time to private companies. Through series of trials, this service proved to be the most successful area of the completely bidirectional function of the system, and both the sponsoring companies and the monitors are very keen to see this type of service continue.

- Information Gate Way. This is a news service based on real time information sent from news agencies and then put on the system in an unedited form. Audience ratings went up significantly after important events of a serious nature or of special public interest.

1-6 Subscriber opinion research

Questionnaires are sent to the subscribers each year in order to evaluate the experiment from various aspects. According to our latest survey, more than 95% of the present subscribers wish to continue subscription of the services. Those who do not wish to continue include people who cannot continue for reasons beyond their control, such as relocation in their companies. The high percentage as verified in our surveys proves that the system is highly valued by the subscribers.

The popularity of the services being provided under the experimental operation is determined significantly by occupancy, as well as audience rating. Occupancy is defined as follows;

$$\text{Occupancy} = \frac{\text{No. of subscriber TV sets}}{\text{No. of switched on TV sets}}$$

Uniquely, the occupancy rating of original programs is extremely high in the Hi-OVIS project. Unlike commercial TV programs or newspapers, what the subscribers to the Hi-OVIS services look for are mainly,
1) Local community information,
2) Consumer and living information, and
3) Educational and cultural information.

2. PROJECT PHASE II (1983 - 1985)

In Project Phase I, we have proved that a completely bidirectional system, including image signals, was not only technically possible but also useful in matching people's needs for information.

We will now outline the position of Hi-OVIS as we see the situation in Japan, and also summarize our plans for Hi-OVIS

in Phase II.

2-1 Current status of CATV in Japan

Large scale, sophisticated CATV systems have not developed in Japan, mainly because (1) CATV systems were originally designed as a remedy for poor reception of radio wave, and (2) in large cities such as Tokyo and Osaka, as many as seven channels are broadcast through-the-air from early morning (6:00AM) till past midnight (0:30AM).

Recently, however, private railroad companies, trading companies, distribution industries and advertising agencies have begun preparations for installing CATV facilities with bidirectional functions, and finance, press and publising companies have shown interest in taking part in such plans.

In addition, the Ministry of Posts and Telecommunications is testing Videotex (called CAPTAINS in Japan), and TV companies have plans to start Teletext broadcasting.

When these plans become more practical, they will not only contribute to the diversification of selective means for information, but also affect industrial structures in Japan as well as people's daily lives, as such plans, when put into practice, will inevitably establish systems for home banking, home shopping, remote medical services and tele-education. Tele-education, especially, will bring help to many people who are unable to go to school.

The Japanese government, fully aware of these plans and possibilities, is planning to establish relevant policies for such undertakings, and some ambitious guidelines are expected in the near future.

2-2 Hi-OVIS Project Phase II

Based on the results of our development in Phase I, we hope to launch new efforts for cabled information systems for the new media era.

2-2-1 Application of televoting function

We are planning to develop systems capability stressed on software for teaching, especially in skill training, since televoting function can be used also for the instructor to evaluate individual students' understanding as if the teacher and the students were in a man-to-man situation. Communication between instructor and students will be established by means of camera and microphone hardware located in their homes as part of the bidirectional image and sound system.

It will be quite feasible to develop these concepts for practical CAI implementation when appropriate software becomes available.

Another application based on the televoting function is test marketing of commercial goods, and this application will be described later under Channel Time Leasing.

Use of the televoting function of the system can become a source of income for the CATV operator since he can charge certain fees to the subscribers who receive educational and other programs that provide benefits to them, or to the sponsors of test marketing and other programs.

The most important strength of CATV systems is the fact that these programs can never be provided by mass media.

2-3 Hi-OVIS connection with other information system

There can be two types of environments that require such interface efforts.

1) Networking CATV systems with Hi-OVIS

Japan is being decentralized, it is said, in reaction to the stereotyped emphasis on centralized social systems in the past, and there has been a strong move for the unique development of local areas. Different communities are making original efforts toward such decentralizing goals throughout the country. The results of such developments are exchanged among different communities to start new efforts or modify their current activities accordingly.

These communities often face common problems, and it can be extremely stimulating for members of such communities to get together and share their problems, experiences and views.

Consequently, we believe that our Hi-OVIS can be connected to other CATV systems to provide opportunities for the members of both systems to exchange their views on any subject they wish.

2) Connecting Hi-OVIS with other data base systems

During last year, latest news from news agencies was broadcast through Hi-OVIS in the form of characters information on the TV screen on a regular basis. This year, we plan to advance further, and at least classify original news into specific different categories so that the subscribers can retrieve latest news in the

form of conveniently suited.

On-line data base systems have become common in Japan recently, and we have also began studying different ways to link our system to such data base systems so that the subscribers can access such systems freely.

2-4 Channel time lease

Several feasibility studies were made last year in which our channels were offered to private companies on a time (hourly) basis, and the experiment proved very successful. Representatives of these companies spoke on different subjects in our experimental programs, and subscribers at home put questions to the speaker, or asked the speaker for more explanation on specific topics. They also gave their own views on these topics. This is not possible on ordinary through-the-air TV programs. Subscribers were well satisfied with our experimental programs, as were the speakers representing the companies, who found the occasion much meaningful, since subscribers often pointed out to them problems that they experienced with the services or products of the speaker's company, which the speaker had previously been unaware of.

With this success last year, we plan to expand the scale of such services, inviting more companies as well as other organizations or individuals from a wider range of activities, to make further studies regarding the possibilities and methods of channel time leasing services.

We find this type of bidirectional communication increasingly essential today when people are becoming more and more "individualized" and the needs for clothing, food, housing and recreation are growing more diversified. Industries who provide products and services for these needs must re-orient themselves to respond to such trends, and they often find that conventional mass media do not provide satisfactory answers. Some examples of such trends and consequences are

1) Audience rating of through-the-air TV programs is declining gradually.

2) The number of specialist magazines, as well as the degree of specialization, is increasing.

3) There is a growing public interest in new media.

2-5 Introduction of still picture data base

Microfilms have been the only source of still picture information for our system due to technical restrictions at the time our system was first installed. Now, we have ample access to still picture disks or video disks. There are several advantages that these more recent media can offer.

1) The original quality of picture is maintained.

2) Capacity is much greater (15000 to 25000 pictures per disk.)

3) Random access to contents.

Unlike VTRs or other media whose operating mode is almost always limited to "forward" only, the way information is provided and accessed will be greatly changed with more advanced disks, allowing users to get specific information, or have access to more general information, freely at any time, for their specific need.

It is likely that these media are most effective in providing educational programs or channel time leasing services as well, because the instructor or speaker will be able to select the most appropriate materials for his presentation according to the degree of understanding or interest of the subscribers.

3. HI-OVIS APPLICATION DEVELOPMENT

Our development has been limited to a large scale, housing development community (new town, or dormitory town). We are now studying the possibilities of installing similar systems in small to medium sized industrial development areas, for business application. Major emphasis will be placed on specific areas of interest, such as the following, in our future efforts.

1) To determine the position of Hi-OVIS in Office Information Systems.

2) The possibility of a link-up between Hi-OVIS and CAD/CAM systems.

3) Cost performance, or cost benefit.

4. CONCLUSION

There will soon be large scale, sophisticated CATV systems, data base systems and videotex services in Japan. At the same time, there will be progress in engineering techniques such as electronic cameras and in media such as video and compact audio discs. When these are realized, Japan will indeed enter the new media era. We are determined to make full use of the completely bidirectional function of Hi-OVIS and adopt new and more advanced technologies as much as possible, to promote further progress in cabled information systems in the new media era.

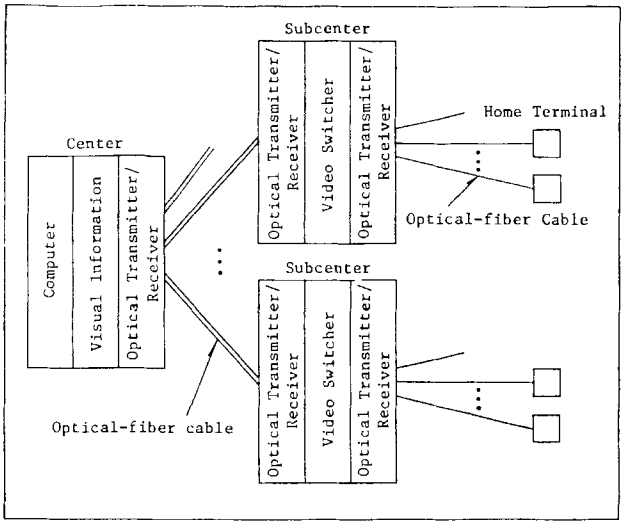

Fig. 1 Basic Configuration of Hi-OVIS

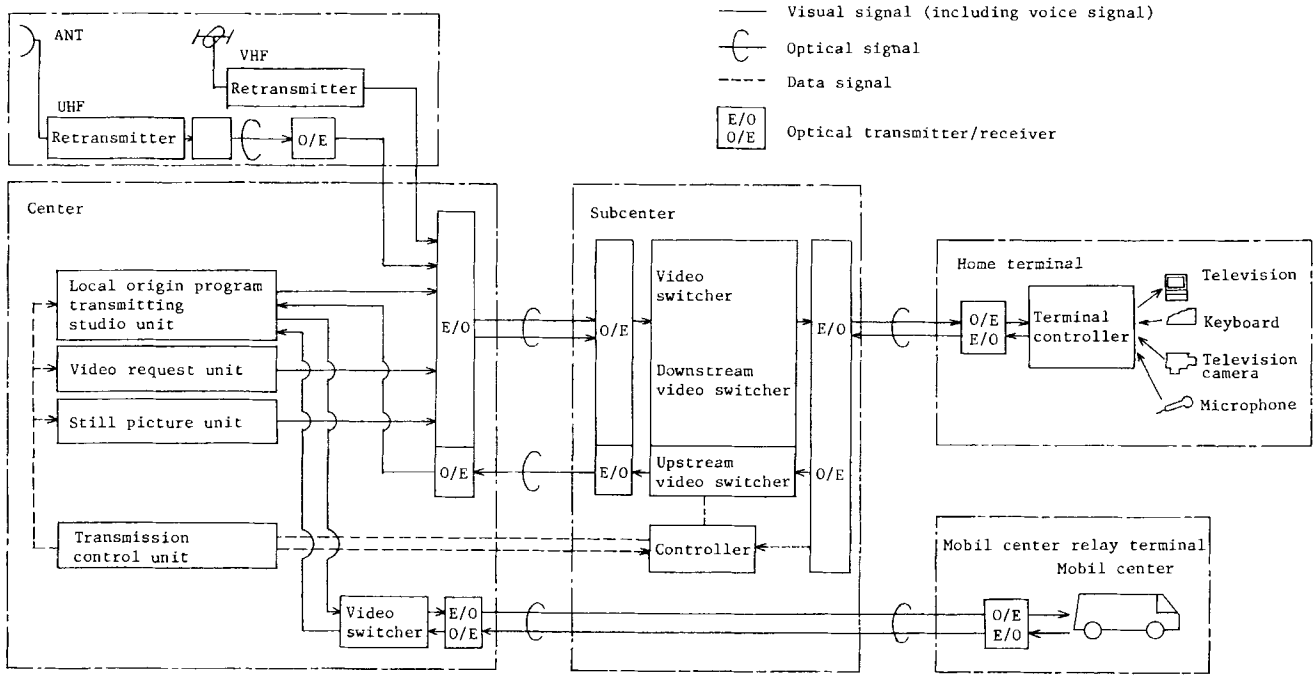

Fig. 2 Hi-OVIS Experiment System Structure

Table I. Outline of Hi-OVIS Services

Types of program		Hardware program	Software program (Max.)
Retransmission	In-area TV waves VHF	6	6
	UHF	1	1
	Out-of-area TV waves UHF	2	2
Studio-produced program		1	1
Video information programs	Video programs at fixed time	3	3
	Video programs by request	4	68
Steill-picture program	Character programs News	1	1
	Program Guide	1	1
	General Programs	4	50
	Microfiche programs	1	20
Subsidiary service	Program reservation	1	-
	Telop	4	-
Total		29	153

Table III. Major Sophisticated CATV Plans

By	Contents
I C N	Broadcast to start in 1985 in Machida, Tokyo with ultimately 30 channels for 50,000 families. They also have plans for a global station network using communications satellites.
Seibu Railway Co. Group	Their installations will connect all Prince Hotels in Tokyo, their vicinities and communities along their railway tracks, eventually 250,000 homes via 20 channels.
Tokyu Corporation Group	Their services will cover areas along their tracks connecting rural areas between southwest of Tokyo and northern part of Yokohama for 200,000 homes in future.
Marubeni Corporation, Uni Corporation, and The Chunichi Shimbun	A preparatory working committee by the three enterprises has been organized to implement their services in the Tokadai New Town in Komaki City, also in residential areas in Nagoya.
Marubeni Corporation, Hakuhodo Inc., and Tohoku Shinsha Film Co., Ltd.	They are establishing Japan's first software supply company in June for CATV applications. Full operation will begin about 1985 for 300,000 to 500,000 households initially.
Keio Teito Railway Electric Co. Group	Their plans are related to redevelopment projects in the vicinities of ten railway stations along their tracks extending to the west of Tokyo. CATV facilities will be installed in all stations along their Keio and Inokashira lines. They also plan to install optical fiber cable systems by 1984.

Table II

Comparison between Hi-OVIS and Mass Media

	Hi-OVIS Subscriber		Non-Subscriber		Hi-OVIS Subscriber		Non-Subscriber	
	Media useful for obtaining local information				Media that are reliable			
Total	1.Hi-OVIS	88.3	1.Newspapers	67.2	1.Newspapers	78.4	1.Newspapers	52.6
	2.Newspapers	84.6	2.TV	42.2	2.TV	75.3	2.TV	41.7
	3.TV	67.3	3.Radio	20.3	3.Hi-OVIS	42.6	3.Radio	18.8
Male Subscriber	1.Hi-OVIS	84.4	1.Newspapers	58.0	1.Newspapers	76.6	1.Newspapers	49.3
	2.Newspapers	81.3	2.TV	52.2	2.TV	75.0	2.TV	42.0
	3.TV	62.5	3.Radio	20.3	3.Books	39.1	3.Radio	18.8
Female Subscriber	1.Hi-OVIS	90.8	1.Newspapers	72.4	1.Newspapers	79.6	1.Newspapers	54.5
	2.Newspapers	86.7	2.TV	36.6	2.TV	75.5	2.TV	41.5
	3.TV	70.4	3.Radio	20.3	3.Hi-OVIS	48.0	3.Radio	18.8
	Media that are close to subscriber				Media that are useful to keeping up with events			
Total	1.TV Newspapers	75.9	1.TV	64.1	1.TV	84.6	1.Newspapers	66.1
	2.Hi-OVIS	62.3	2.Newspapers	54.7	2.Newspapers	82.7	2.TV	58.9
	3.Radio	22.8	3.Radio	28.6	3.Hi-OVIS	32.7	3.Magazines	28.1
Male Subscriber	1.TV Newspapers	78.1	1.Newspapers	58.0	1.Newspapers	89.1	1.Newspapers	69.6
	2.Hi-OVIS	48.4	2.TV	55.1	2.TV	85.9	2.TV	52.2
	3.Books	25.0	3.Radio	18.8	3.Magazines	31.3	3.Magazines	26.1
Female Subscriber	1.TV Newspapers	74.5	1.TV	69.1	1.TV	83.7	1.Newspapers	64.2
	2.Hi-OVIS	71.4	2.Newspapers	52.8	2.Newspapers	78.6	2.TV	62.6
	3.Radio	24.5	3.Radio	34.1	3.Hi-OVIS	42.9	3.Magazines	29.3