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I N S T I T U T E F O R
Learning Innovation

Cleveland Museum of Art
Lifelong Learning and The Arts

FINAL SUMMATIVE REPORT

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Executive Summary

Lifelong Learning and the Arts was an innovative program developed by the Cleveland Museum of Art (Museum) to intellectually engage and facilitate social interaction among older adult learners. This program was unique at the time of its inception in its use of a combination of archive video on demand and state-of-the-art interactive live broadcast technology. The end goal of the project was not simply to provide arts enrichment but to use the arts as a context for overall improved life quality.

The Museum partnered with more than a dozen local organizations who served as content partners. During the duration of the project, the Museum also partnered with a variety of care-giving organizations including senior-care facilities, adult-care facilities including one for the mentally and physically disabled, a community college and three homebound individuals.

The two research questions for this project were:

1. To what degree does the interactive arts programs broadcast intellectually engage older adult learners?
2. To what degree does the TOP project facilitate social interaction among older adult learners?

The Lifelong Learning and the Arts project overcame its early technological hurdles to provide meaningful content to its audiences and served as model demonstration of content delivery to non-traditional audiences. Those served by this program already had a great deal of personal interests and previous knowledge when they entered the program. Overall, the participants interviewed had high life satisfaction scores and reported little to no loneliness. Yet despite, or in some cases perhaps because of, the high degree of pre-existing interests, these participants found the programs to be meaningful, fulfilling a need that had not been previously met.

The Lifelong Learning and the Arts project had two main goals- to stimulate intellectual engagement and facilitate social interaction. The program stimulated intellectual engagement in a variety of ways across a diverse population set. The project was successful, though somewhat less so, at facilitating social interaction among the participants. Different sites expressed these project benefits in different ways. Although the program at CCBMR seems to be intellectually engaging and promotes other unintended benefits, such as increased focus, it does not necessarily promote interaction among the participants. Yet increased interaction is in evidence at other sites from conversations, actions and relationships between the participants.

Any project that is heavily dependant on technology to function risks failing from the very beginning, due to problems with the technology overtaking all other concerns. This risk was even greater in a project such as this, where the technology was fairly experimental. Despite issues with the technology upon start-up, the program overcame those issues and progressed to the next level of potential communication failure- the actual interaction with the Museum staff

via the broadcasts. The program succeeded at the technological level, and then again at the level of personally connecting with the participants.

An unintended, though valuable program benefit, was the sense of increased identification with the Cleveland Museum of Art. The participants in this program felt that they have been a part of the cultural life of Cleveland, and this program enhances their sense that they are still part of the community.

Engaged activities coordinators were critical to the success of the project, and those sites that did not have activities coordinators, including the homebound individuals, were slightly less successful. The activities coordinators function not only to generate and maintain interest, but also to work as technology coaches and conversation facilitators.

Program Replication

If one were to replicate the Cleveland Museum of Art's Lifelong learning and Arts program, there are a few key things to consider.

- *Audience.* Is this an audience that would appreciate a historical view of art, or would they prefer studio art classes? Do the classes need to be chronological, or would it be better to tailor specific classes with a "hook" that the audience can relate to? Those who would seek to replicate this program should carefully consider the audiences they intend to reach. It is easier to provide content to homogenous audiences (for example, only dementia patients) where less time needs to be devoted to content creation, than to heterogeneous audiences such as those served by this program, including both seniors and young adults, higher and lower functioning individuals and persons of all income and interest levels, where content needs to be developed for each audience.
- *Maximum benefit.* Due to the experimental nature of this program and the innovative technology in use, it would be inappropriate to evaluate the success of the program based on the numbers of people served, as this program was artificially limited from the beginning. With more stable technologies available from the onset of a program, any new projects would have more freedom to address lower-functioning audiences. Future programs will need to be strategic in their thinking about which audiences they may wish to serve. Each of the sites in this program was made up of underserved audiences who benefited from the project; yet the sites were far from homogenous. It may be cost-effective in the future projects to choose one or more "sub-niches" from within these audiences.
- *Fostering additional outcomes.* One of the truly beneficial unintended outcomes of this project was the participants' increased sense of identification with the Museum and with the community as a whole. Participants gained a "Right here in Cleveland, our museum has..." outlook. If a future program were to incorporate more geographically distant areas, thought should be given towards how to foster community links, perhaps by tying some programming to local institutions.

- Personnel, both internally and site-specific. Once the technology becomes the norm, the project success rests on the personnel involved, both at the originator site, in this case the Museum, and at the participant sites. Committed and responsive personnel are crucial at both places. On the museum's end, one should be careful not to underestimate the power of the personal magnetism of the hosts. Just as some television programs are successful and others with the same formatting are not, success for these broadcasts can be dependent on the nature of the broadcast hosts.

As a program grows in size larger than the one documented here, it will become difficult to guarantee the capabilities and enthusiasm of the hosts without specifically monitoring those variables. Since both of the key outcomes, social interaction and intellectual engagement are dependent on the coordinators at the receiving end, it may be in the originator's best interest to screen sites based on availability and commitment of the personnel. Future programs may consider offering an initial first broadcast just for the activities coordinators, in order to train them on how to respond to broadcasts and facilitate discussions among their participants.

A secondary impact of a larger program would be the difficulties in making the personal connection over air-time. If a future project were to be much larger yet include this same type of audience, methods need to be devised to retain that sense of recognition from the hosts.

- Understanding of the medium. Although one would expect technical issues such as picture quality to be slowly resolved over time in future projects, both participants and coordinators in future projects need to understand the fundamental nature of the programs: Broadcasts are not television, and will not look or feel like television. Instead, they provide additional capabilities that television can not provide, such as interaction with the hosts. Understanding the nature of the program will allow participants to both enjoy the programming more and also take fuller advantage of the capabilities.

The Lifelong Learning and the Arts project should be used a model of content delivery to non-traditional audiences, increasing participants' quality of life. With the continuing state of developing technology and the foundation developed in this project, future programs could be developed for a wide-variety of audiences, increasing life satisfaction and forming both personal and community-wide connections.

Introduction

Lifelong Learning and the Arts was an innovative program developed by the Cleveland Museum of Art (Museum) to intellectually engage and facilitate social interaction among older adult learners. This program was unique at the time of its inception in its use of a combination of archive video on demand and state-of-the-art interactive live broadcast technology. The end goal of the project was not simply to provide arts enrichment but to use the arts as a context for overall improved life quality. The Museum partnered with more than a dozen local organizations who served as content partners. During the duration of the project, the Museum also partnered with a variety of care-giving organizations including three senior-care facilities, two adult-care facilities including one for the mentally and physically disabled, one community college providing classes to senior citizens and three homebound individuals. The older adults that the Museum served were in locations such as residential care facilities, rural areas or were simply homebound; which can challenge residents' ability to remain active and connected to the outside world. Current research suggests that these populations of older adults can benefit most from distance learning opportunities because it improves their opportunities for socialization and intellectual stimulation. This program sought to connect older adults with each other and to provide them with meaningful content and information about the arts, as a context for improving their lives.

The Institute for Learning Innovation served as the evaluator for the Cleveland Museum of Art's Lifelong Learning and the Art project, funded by the Technology Opportunity Program (TOP) at the National Telecommunications and Information Administration, Department of Commerce. The Institute was integrally involved in the design and review since project inception, allowing the project to incorporate critical feedback from the beginning. This report serves as the final summative evaluation report on the project.

The two research questions for this project were:

3. To what degree does the interactive arts programs broadcast intellectually engage older adult learners?
4. To what degree does the TOP project facilitate social interaction among older adult learners?

Program Background and Format

Lifelong Learning in the Arts involved multiple departments within the Cleveland Museum of Art and cooperative efforts among those staff. Leonard Steinbach, Chief Information Officer, served as Project Director as well as co-manager of the project with the Director of Education, Marjorie Williams.

The program sites were a diverse mix of facilities, with a total of 7 sites. They consisted of the following:

Abington Arms

Abington Arms is a subsidized housing with approximately 160 independent living units consisting of generally lower-income, racially-mixed residents, primarily senior citizens with some disabled adults. Abington Arms has a strong relationship with the museum through Parade the Circle. In this program a group of fifteen to twenty residents design costumes and props and march in a parade celebrating the University Circle neighborhood.

Benjamin Rose Adult Day Care Center

This site joined the program during the last one-third of the grant period, and was not included in the baseline data or early formative data collection for that reason. The center is a day time care facility for primarily older lower-income and African-American adults. The adults generally have memory impairments or mental illness and were lower-functioning than the initial baseline participants.

Benjamin Rose Individual Clients

This "site" was made of three individual clients, each of whom was homebound to some extent for a variety of reasons. Each client was provided their own set of equipment, trained on how to use it, and received occasional visits from program personnel to facilitate the process. One of the individuals dropped out of the program early on, the other two remained. The first individual was a white male with computer experience in his early 60s, at home due to a stroke that had left him in a wheelchair. The second participant was an African-American woman in her late 70s to early 80s with no previous computer experience. Fairly fully house-bound due to a variety of medical issues, she had regular visits from her children.

Cuyahoga County Board of Mental Retardation and Developmental Disabilities, East Cleveland Branch (CCBMR)

CCBMR is a county-run adult services center designed for adults over 18 with mental or developmental disabilities. Clients receive support in several skill areas including mobility, self-help and daily living skills, communication, community awareness, social and emotional growth, *functional academics, human sexuality, work skills training and job placement assistance*. At the East Cleveland Center, some clients are employed by a nonprofit organization responsible for securing subcontract work from area businesses and industries and overseeing its completion at

our sites. The work consists of manually-oriented jobs such as collating, packaging, assembly and salvaging for more than 200 area companies and organizations. Or they may participate in various activities at the center, including classes, outings, crafts and personal development. Clients come from group homes and private homes and take private transportation to the adult training center for a full 8-hour workday.

Lorain County Community College (LCCC)

Lorain County Community College is Ohio's top-ranked community college approximately one hour away from Cleveland. The Lorain County Community College through the Center for Life Long Learning offers a wide array of classes on three different levels. They range from classes just for fun, (Personal Fitness for Older Adults) to classes that require outside preparation, (Conversational Spanish). The average age of their students is between 68-70 years old. The students are very active and independent. They must be able to provide their own transportation, with most driving themselves. Each student takes on an average two to three classes per semester. Classes are well attended and there must be at least twelve students registered for the class to begin.

Judson House and Judson Park

Both Judson House and Judson Park were within close proximity to the museum and are run by the same cooperation, but remain two physically separate sites with unique qualities and atmospheres. Judson Park offered both independent living and assisted living, with a total of approximately 235 units. Judson Manor had 250-300 units, of primarily independent living.

McGregor House

McGregor House is a non-profit senior facility whose 100 residents had a range of physical capabilities, despite the average resident age of over 90 years old. Approximately one-third of the residents were in assisted-living units.

The staff at the Cleveland Museum of Art arranged five regularly scheduled programs per week for these sites, *corresponding with four distinct styles and formats*. To the casual observer, it would appear that project participants were gathered in a recreation room watching a television show. The longer one was to observe, the more clear it would be that what was taking place was not the watching of a television show, but the live broadcast of art and other types of programming that included the ability for the participants to interact with the hosts. Participants were able to e-mail questions to the host at any time, which the program hosts would see and then respond to on the air. This allowed the participants to help shape the direction of the program.

In the first format type, broadcast on Monday and Wednesday afternoons, the audience participated in hour-long broadcasts in a variety of subjects from recent acquisitions at the CMA, to discussions regarding a particular artist or movement. This format included the bi-monthly show "The World of Great Art" which took viewers on a chronological journey through art and art history. Content partners from around the community also participated in these broadcasts. The Cleveland Museum of Art hosted organizations such as the Cleveland Artists Foundation,

Cleveland Botanical Garden, Dancing Wheels Company, University Circle Incorporated, Silver Apples of the Moon Poetry Project, and the James A. Garfield Memorial Home.

This 60-minute broadcast was comprised as follows:

- a) 20 minutes of lecture/discussion about the topic,
- b) 5 minute break (at which time viewers can type in any questions on the "Question Manager"),
- c) 20 minutes of answering inquiries and delivering further content,
- d) 5 minute break for more questions, and
- e) 10 minutes to answer last questions and finish the program.

In the second format, broadcast every Friday, half-hour classes were taught. The first often focused on a particular artist from the CMA collection. This live broadcast was developed for the Benjamin Rose Adult Day Care Center, a site that includes viewers with a variety of mental and aging disabilities.

A third format was the second Friday show, host Kelly Williams taught a studio art lesson that was followed by activity coordinators and artists at the site. That show was broadcast to clients at the Cuyahoga County Board of Mental Retardation and Developmental Disabilities, East Cleveland Branch.

In a fourth format, special programming was created to meet the needs of independent sites such as Abington Arms. Museum staff worked with art therapist Nancy Roy from the facility to team-teach art history and studio projects for their clients. These broadcasts occurred approximately once a month, and included such topics as "Mosaics," "Religious Imagery" (used on fabric to create a quilt), "Resist Dyeing" and "Photo Transfers".

In addition to providing programming, each of the program sites, including each of the homebound individuals was loaned the equipment to view the broadcasts, including a computer, a large screen monitor, and a wireless keyboard and mouse. Each of the sites was connected via high-speed lines, either DSL or T-1, to Cisco's IP/TV broadband multicast IP transport. Cleveland Museum of Art staff provided training and support for all of the equipment, including making recurring site visits.

Methodology

As this project incorporated very new technologies and techniques in an innovative way, it was critical that both the project and the evaluation function in a flexible, responsive fashion. The technological difficulties encountered included both providing the technology to the participants and configuring the equipment once it arrived so that it would meet the needs of the participants. The bankruptcy of the telecommunications provider added delay to the implementation of the program. (An independent technology evaluation was completed; that documentation will be sent under separate cover.) To facilitate a more comprehensive evaluation, it was decided to modify both the pace and the methods of the participant evaluation process accordingly.

To attempt to measure the change that might occur among the learners as a result of the project, baseline data was collected by conducting interviews with participants and staff at the care facilities before any programs had been broadcast. Caregivers choose the baseline interviewees based on participation in similar programs, in order to maximize the likelihood of matched data at the formative and summative stages. As participation in the Lifelong Learning project was voluntary, it was impossible to ensure that those chosen for the baseline interview would indeed participate in the project. These interviews assessed the level of engagement and interest in the arts and were based on quality of life scales developed by Neugarten, Havighurst and Tobin. (Both the interview protocol and the quality of life scale it was based on can be seen in Appendices A and B.) We collected baseline data on participants' past involvement with the arts and culture, educational background, current opportunities for social involvement both in and outside the facility, and experience and comfort with computer technology. Formative participant interviews were collected during two four-day trips to Cleveland, one in April 2002 and the second in February of 2003.

For the start-up of the program the audience was purposively biased towards higher-functioning individuals in order to try and involve higher-functioning individuals who might not be as easily discouraged by problems arising from the technology implementation. As the program progressed, lower-functioning individuals, such as dementia patients at the Benjamin Rose Adult Day Care facility were included.

Initially, the research plan called for monitoring participants and activity coordinators via on-line surveys collected after program broadcasts. This proved an untenable path first due to the difficulties in the internet connections to the sites, and secondly as it became clear that the participants were at vastly variant comfort levels with the technology involved. Instead, questions that participants asked the hosts during the broadcast were collected, entered into a database and analyzed. This methodology allowed not only analysis of the questions asked during the broadcasts, but provided a number of different ways to look at the levels of engagement and involvement by the adult learners.

As additional data sources, activity coordinators and related personnel were interviewed both in person and via telephone. Some activities coordinators completed worksheets regarding participant interaction during the broadcasts. One site, Lorain County Community College, had participants fill out an evaluation sheet for each broadcast and then provided copies of these evaluations as additional data.

Baseline Interviews

Baseline data was initially collected February 5th - 8th 2001 in a series of interviews at five of the participant sites, and was reported in the interim report. The following section has been excerpted from the appendix of the interim report.

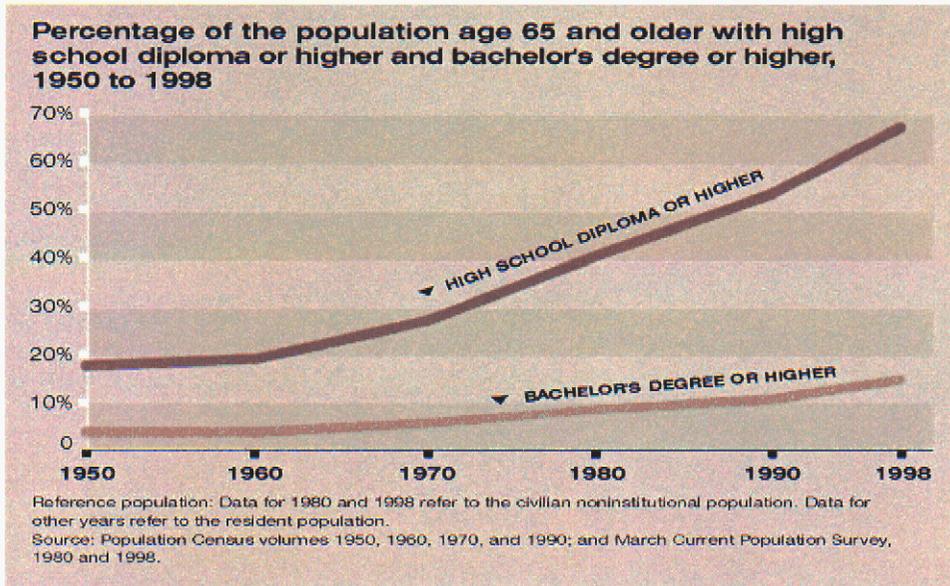
Face-to-face participant interviews were conducted at Judson Park, Judson Manor, Abington, McGregor, and Cuyahoga County Board of Mental Retardation (CCBMR). A sixth site, Lorain County Community College, offered the Cleveland Museum of Art/ TOP program as a Lifelong Learning course for local county residents. There were no face-to-face participant interviews conducted at Lorain County Community College, as the College did not yet have a class participation list, but activity coordinators were interviewed. Three additional individual participants from the Benjamin Rose Institute were provided equipment so that they might participate in the program from their individual homes. One of these participants dropped out of the program; the two remaining individuals were interviewed by telephone.

Demographics

It was difficult to characterize the “average” participant in this program, as the sites varied greatly from one another. The majority of the interviewed participants (80%) are over age 60. All of those participants under age 60 were from the CCBMR, and those participants did not tend to have formal higher education. Interviewees at Abington were more diverse, had a variety of educational levels, and comprised a range of ages, all over 60. Interviewees at McGregor also had a wide variety of educational levels, but they tended to be an older group, with all interviewees over age 80. The interviewees at Judson Park and Judson Manor tended to also be in their 80s and 90s, but were a more highly educated group- the majority of the interviewees had completed a graduate degree.

Compared to national data (See Table 1), the program participants were highly educated, although as described above this varied greatly by program site. In 1998 national data from the Federal Forum on Aging-Related Statistics approximately 15% of the population over 65 had a bachelor’s degree or higher. Despite wide divergence from site to site, the population eligible for this program was overall more highly educated than the average senior citizen.

Table 1: National Data on Education of Seniors by Decade



Source: Older Americans 2000: Key Indicators of Well-Being, a report of the Federal Forum on Aging-Related Statistics; <http://www.agingstats.gov/default.htm>

The demographics above do not begin to sketch out the wide diversity in TOP program participants. This diversity of viewpoints is reflected in the former professions some discussed. For instance, one man interviewed was the former CEO of a hospital, whereas another woman stated her profession was housework. "I came to Cleveland in the depression and did housework", she said. Diversity in educational level, income and physical capabilities also existed.

Because there was a perception that retirement and nursing home residents become less active the longer their residence, we asked how long each resident had been at the facility. Nearly 40% of the interviewees had been at their facility for 10 or more years. Just over one-fifth, 21% had been at the facility 4-6 years and just over one-fourth (26%) had been there between 1-3 years. Thirteen percent had been at the current facility for under a year.

Friends/Family

The majority of interviewees had friends or family they were in regular contact. These social connections were vital to many of the interviewees, who stated that family and friends were currently the most important things in their life.

CMA Visitation

Connections to the Cleveland Museum of Art were fairly strong at all sites. Respondents spoke of eye-opening exhibit visits as a child, recent special exhibitions and long-held memberships. All of those interviewed were familiar with the Cleveland Museum of Art, although

approximately 15% had never visited or could not recall ever visiting the museum. Many of interviewees at the CCBMR were frequent visitors to the Museum, mostly by virtue of participating in the art program run by Carolina Martin. Residents of Judson Manor also spoke of frequent or occasional visits to the Museum. Although some residents from McGregor spoke of still visiting the Museum, the majority indicated that it was an activity they used to do, but didn't any more. The majority of Abington and Judson Park interviewees also indicated that they occasionally went to the Museum, but that some of them had not been for some time, primarily due to transportation problems or deteriorating health.

Cultural Activities

The bulk of the interviewees, over 46%, participated in some sort of cultural activity other than visiting the Cleveland Museum of Art. These activities were widely defined and consisted of such things as singing in the church choir, participating in the CCBMR Art class at the Museum, regularly listening to opera CDs or participating in facility art rooms. Most of the recipients in this category spoke of participating in the creation of art, music or other forms of expression, rather than attending art or cultural events. Another third of the interviewees (31%) said that they used to regularly participate in such cultural activities, but have not done so in quite some time. These respondents spoke of going out to attend events, rather than creating art or music. Activities frequently mentioned were going to the theater or to the symphony or ballet. Another 19% responded that they rarely or never took part in or attended any art or cultural activities. Abington respondents were more likely to say they rarely or never took part in cultural activities; McGregor and Judson Park respondents were more likely to indicate that at one time they participated in these activities, but no longer do so.

Social Activities

What the interviewees did have in common is a strong perception of how socially active they were. More than three-quarters of the interviewees considered themselves active or very active. The remaining 15% of respondents considered themselves neither active nor inactive.

People interviewed overwhelmingly felt (95%), regardless of facility, that their facility had quite a number of opportunities for social interaction.

Three-quarters of the respondents stated that they were rarely lonely. Several mentioned feeling lonely recently after the death of a spouse or parent. Others spoke of the difference in being alone versus being lonely, describing how they valued their time alone. Representative comments about loneliness include:

“My husband died last year- almost a year ago so it's been lonely but I get out and do things and it helps.”

“There's a difference between being lonely and being alone. I need to be alone- need to have time to myself.”

“No such thing. I can't understand it. I've never been lonely in my life. I don't get it. I get up and mop a floor.”

“No, I don't. I couldn't possibly be here. My goodness- I can't even lie down for a nap.”

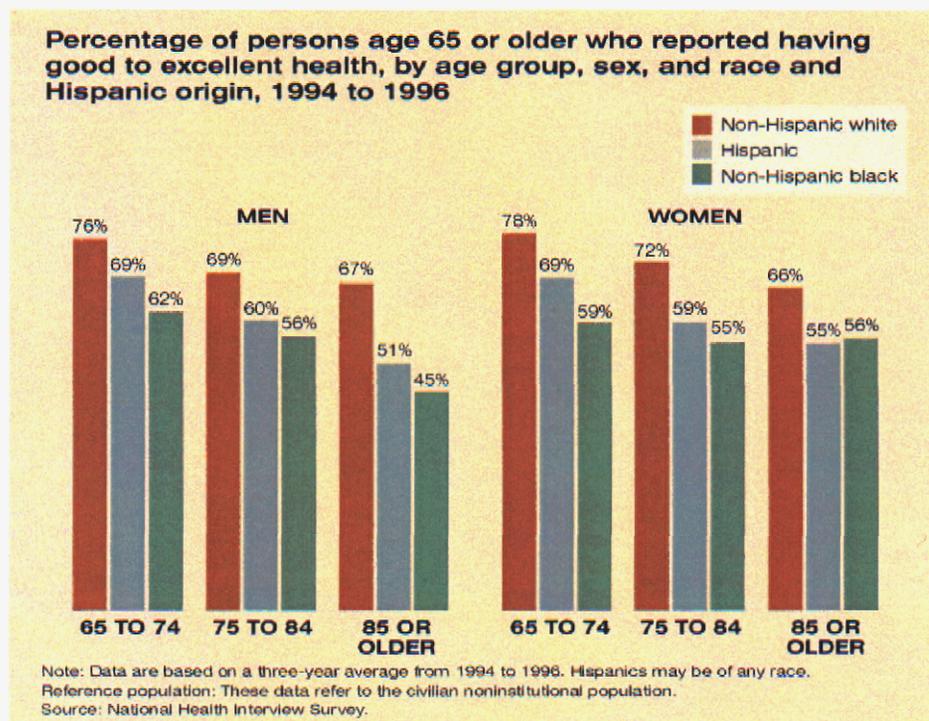
“I got lots of gifts, flowers and cards for my birthday last month. I'm lonely at night. Alone in my room. I can't sleep, I read until midnight- otherwise I think too much about what I have and don't have.”

Health

Interviewees generally had a positive attitude about their health. They were asked to rate their health on a 1 to 5 scale, 1 representing being in great health and 5 representing being in poor health. Over 75% of the respondents rated their health as a 1 or 2, indicating good to great health. These high ratings were surprising due to the condition of the respondents. The respondents who described poor health tended to have common conditions which might be treatable, such as high blood pressure or diabetes, whereas those with neutral to good health might have quite serious conditions, such as cancer. For instance, one man reported himself in good health despite having a pacemaker and going blind from macular degeneration. He felt his health was good because he did not need to take any prescription drugs. Another reported that that his health was good, despite having lost the use of his legs to multiple sclerosis.

This data is not dissimilar to national data on seniors' self-perception of health. Over half of the men and women under 84 reported by in good to excellent health, according to mid-1990s statistics from the Federal Forum on Aging-Related Statistics. (Table 2) These statistics were not collected of persons specifically in care facilities, where one would expect to find a lower percent of overall healthy persons, yet they are still very similar to the population under study here.

Table 2: National Data for Seniors on Self-Perceived Health by Age, Ethnicity and Gender



Source: Older Americans 2000: Key Indicators of Well-Being, a report of the Federal Forum on Aging-Related Statistics; <http://www.agingstats.gov/default.htm>

Technology

Interviews at the different sites revealed a variety of feelings about technology. Some indicated both comfort and familiarity with computers, others discussed some previous experience and some anxiety about working with technology, while still others stated they had no experience and no interest.

Representative comments included:

"No- I would like to be. I would like to send messages to my niece."

"I've taken a computer class; I'm learning to type a letter. I have to do it more often to know how. I have a computer my son gave to me. I want to use it for e-mail with my son, but I don't use it, I have a fear it will go wrong."

"Not into that at all. I'm closing my mind to that. It takes so much energy to get around the regular way."

“I love my computer. I make fliers for groups here. It’s an old one; I’m hoping to get a Gateway. I was on AOL at the one time, but got too busy.”

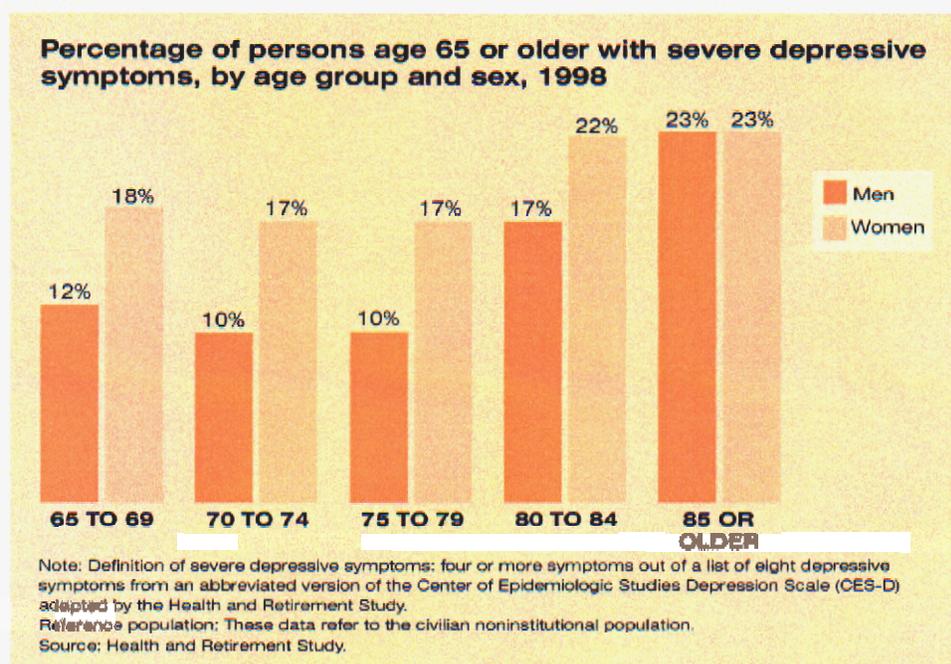
Conversations with coordinators at Lorain County Community College revealed that unlike at the other sites, the majority of the participants were computer literate.

Overall Life Satisfaction

In the baseline interviews participants were asked several question based off of a traditional social gerontological measurement scale called the life satisfaction index. Questions asked included “As you get older, would you say things seem to be better or worse than you thought they would be?” and “How satisfied would you say you are with your way of life?” Life satisfaction scores were calculated for all baseline interviewees, with the exception of those at the CCBMR, who found it difficult to answer the questions. Overall, life satisfaction was high-averaging a score of 7 out of 10. Most participants felt they were not lonely. Several times residents reported the need to spend time alone which they felt was necessary for their privacy, but did not feel lonely in consequence. As mentioned above, even those with significant health setbacks felt that their life was generally good.

For indirect comparison purposes, Table 3 is included regarding senior depression by age. Nationally, 10%-23% of non-institutional persons over 65 suffer from severe depressive symptoms, according to the Federal Forum for Aging-Related Statistics. From these results one could conclude that the majority of seniors were not severely depressed, but severe depression was also not uncommon.

Table 3: National Data on Senior Depression by Age



Source: Older Americans 2000: Key Indicators of Well-Being, a report of the Federal Forum on Aging-Related Statistics;
<http://www.agingstats.gov/default.htm>

Follow-up Interviews

Follow-up interviews were conducted with participants and activity coordinators both in-person and on the telephone. Unfortunately, only three of the participants in the baseline interviews (including two of the home-bound participants from Benjamin Rose) became regular attendees of the broadcasts. Therefore we faced a variety of confounding factors in measuring change over time. Despite the lack of exact match, actual participants in the project resembled the baseline interviews in key ways.

The program served a wide variety of demographic strata, from the young to middle aged mental retarded adults at CCBMR to retirement age more rural attendees at Lorain County Community College to participants from McGregor and Judson in their late 70s and 80s. As in the baseline sample, education and professional status varied widely both between and within partner sites. The majority of those living in full-time facilities had at least some family or friends whom they saw on a regular basis.

Similar to the baseline interviewees, all of the participants were previously aware of the Cleveland Museum of Art and were attendees. Some visited the Museum only for special exhibitions, but other described themselves as regular attendees or even volunteers in the past. The interviewees described past involvement in cultural events and interest in books. All of those interviewed in full-time facilities felt they had many opportunities for regular social interaction.

Very similar to the baseline group, some of the participants experienced day-to-day health difficulties, but they did not characterize themselves as suffering from health problems. As one interviewee stated, "I've made a conscious decision to be happy." Another interviewee, who suffered serious pain from deep-seated arthritis said, "The Lord is merciful. The Lord put me here so this is where I belong. I have deep faith- that carries you through." Overall life satisfaction matched that in the baseline interviews-approximately 7 out of 10.

The majority of the participants interviewed had a strong interest in working with computers. Still, they were more comfortable having others work with the technology end of the program, not feeling it was their role to use the equipment. There were exceptions to that viewpoint, including at Abington Arms, which will be detailed further on in this report.

Results and Discussion

Response at Individual Sites

Abington Arms

At Abington Arms, there was no dedicated activity coordinator- the residents were independent tenants. In the beginning, Susan Pershing, the administrator who also functioned as a building manager, promoted the broadcasts but did not attend or facilitate the broadcasts unless there were major technical difficulties. Susan felt that much of the problem she had in implementing the program resulted from her inability to "corral" the residents into viewing broadcasts. Because of this lack of an activity coordinator, the program was not originally as successful at Abington Arms as it has been elsewhere; residents rarely tuned in for broadcasts. Part way through the grant, the Museum began collaboration with the art therapist at Abington Arms and designed a specific broadcast that combined both art history and a studio art class, which dovetailed with activities, and was offered in the Abington Arms art room. That collaboration helped revive the program at Abington Arms.

The other event which helped revive the program at Abington was the interest of one particular individual named Fannie. Fannie was younger than many of the residents and had a strong interest in both the material and the technology. She was able to operate the equipment and help teach others how to do so. Previously, the equipment such as the keyboard had been locked up at times for fear of its being stolen. Residents were then reluctant to ask the office staff for equipment or help, especially if the office staff was busy. Fannie's interest and ability to help

others facilitated new interest in the program, and she was able to serve as a very unofficial facilitator for the broadcasts.

Benjamin Rose Adult Day Care Center

This site joined the program during the last one-third of the grant period, and was not included in the baseline data or early formative data collection for that reason. The center was a day time care facility for primarily older lower-income and African-American adults. The adults generally have memory impairments or mental illness and were lower-functioning than the initial baseline participants. The majority of the clients were unable to get to the museum. The director of the facility had a background in Art Therapy and has encouraged the activities staff to pursue art as recreational therapy, both for the staff and the clients. The activities coordinator had additional outside training and was enthusiastic about the program and the program's possibilities for increased interaction and cognitive function. In interviews, program staff at Benjamin Rose discussed the need for strong staff buy-in, as well as the understanding that the program could not be used as a "time-filler" but must be an active project within the classroom in order to have maximum benefit for the clients. Throughout their participation in the program, staff at Benjamin Rose continued to promote the program, and propose new ideas for related programs.

Benjamin Rose Individual Clients

This "site" was made of three individual clients, each of whom was homebound to some extent for a variety of reasons. Each client was provided their own set of equipment, trained on how to use it, and received occasional visits from program personnel to facilitate the process. One of the individuals dropped out of the program early on, the other two remained. The first individual was a white male with computer experience in his early 60s, at home due to a stroke that had left him in a wheelchair. At the beginning of the program, he felt his quality of life to be poor. He did watch programs on a semi-regular basis, and asked questions of the hosts. During the span of the program, and despite the development and treatment of prostate cancer, he became more and more involved in activities outside the home and his worldview improved, however his participation in the program declined somewhat.

The second participant was an African-American woman in her late 70s to early 80s with no previous computer experience. Fairly fully house-bound due to a variety of medical issues, she had regular visits from her children. She claimed to watch up to two programs a week, but did not generally ask questions as she preferred to have someone type them for her. She also made use of the equipment to connect to the internet, as program staff encouraged her to do, and enjoyed using the internet. As she said "It fills a vacancy for me- it's more interesting than the TV." She also learned to use e-mail and e-mail her family, including doing some instant messaging with her niece.

While both of the individual participants found the program to be worthwhile in that the material was interesting and the equipment very useful, it was clear that one of the main benefits in their perspective was the chance to interact in-person with program staff when staff made visits to their homes.

Cuyahoga County Board of Mental Retardation and Developmental Disabilities, East Cleveland Branch (CCBMR)

Due to the various mental and physical disabilities at CCBMR, the same parameters for evaluating other institutions are not applicable at this site. At this site interaction between individuals was at a minimum. This was not surprising, given that many of the participants had difficulty expressing themselves verbally. However the participants clearly feel the broadcasts are interactive. The host greeted them by name and individually encourages their work through her presence on the large screen. This recognition was reinforced by the CCMBR staff, who with the host continue to interact with the participants through out the broadcast. Under this recognition, their artistic efforts bloomed and they were able to stay on task and enjoy the lesson, showing clear pleasure in participating. Participants look forward to the Friday program all week long. Those who were normally unable to stay on task for more than a few minutes at a time, work steadily through the duration of the broadcast.

Lorain County Community College (LCCC)

The broadcasts at the community college took place through the College's Lifelong Learning program, which provides adult education classes for enrichment purposes. Unlike at the other sites, this was a true classroom experience, where adult individuals in the community, still living in their own homes, registered for and attended a "class" on art. Unlike some of the other sites which had expectations of the broadcasts to appear as high-quality television shows, the students at LCCC had expectations that broadcast would be like a regular class, with chances to ask questions, taught by an expert electronically. This model was in some ways closer to what the broadcasts were actually like. Unfortunately, the technology was not up and running by the semester start date at LCCC, forcing museum staff to drive out to Lorain County and deliver videotaped programs. The nature of the LCCC site, running the broadcasts as if they were a typical class rather than an experimental technology collaboration, led to some participants' frustration. Additionally participants felt the subject matter should be in true course fashion moving from one period in art to another, rather than individually contained broadcasts on a diverse set of subject matter. As the technology and formatting improved, the ratings from the LCCC participants went up.

Judson House and Judson Park

While these two sites were run by the same over-all corporation, they were physically two separate sites, with different residents and program implications. As mentioned earlier, the interviewees at these sites tended to also be in their 80s and 90s, but were a more highly educated group- the main of the interviewees had completed a graduate degree. They were also frequent visitors to the Museum, or had been at one time, and were likely to have once been Museum members.

Although both the Judson Park and Judson Manor sites suffered from technical difficulties early on, the problems early on seemed to decrease participation at Judson Manor more than at Judson Park. Throughout the program, Judson Manor had difficulties with low participation, and residents who expressed frustration with poor sound quality or other problems during a program

would not return to the next session. The Manor moved the equipment into a living room from where it was originally placed in a ballroom, increasing both the acoustics and the program dynamics. Still, the staff at the Manor considered it to be a successful program when four residents viewed the broadcast. Expectations for the program technical quality were very high. Those who did attend the broadcasts were interested in the content matter and were active in questioning the hosts. As the project was coming to an end, staff at Judson Manor were working on the possibility of including more residents from the assisted living floors, perhaps by hosting the broadcasts from the assisted living common room. They had also scheduled to have the residents tour the Museum's broadcast studio, in an effort to convey the experimental nature of the technology and the nature of the studio production.

Judson Park residents, on the other hand, despite having similar technical issues, seemed to be semi-content with the experimental nature of the program. The participants suggested format changes and content ideas along with their frequent questions.

McGregor House

McGregor House was a full-care nursing facility whose residents had a range of physical capabilities. As mentioned earlier, the residents who participated were primarily white women in their 80s. McGregor was one of the first sites to be up and running, and regularly had a group of 5-12 women both viewing and participating in the broadcasts. Interviews with the participants and staff indicated this core group of attendees discussed the broadcasts both during the presentation and afterwards, sometimes bringing up particularly intriguing sessions at dinner. McGregor benefited from an enthusiastic activity coordinator who worked with the participants to encourage questioning. Interviews with the activity coordinator reveal that some participants in the broadcasts rarely took part in other McGregor House activities, and therefore the program was instrumental in forming new relationships.

Response by Program Aspects

Audience

From analyzing the data, it is clear that those served by this program already had a great deal of personal interests and previous knowledge when they entered the program. The participants at the beginning were by and large generally engaged with others and the world at large. Overall, the participants interviewed had high life satisfaction scores, with a median score of 7 out of 10, and reported little to no loneliness. This finding was partly by design, as a decision was made during the start-up of programming to try and involve higher-functioning individuals who might not be as easily discouraged by problems arising from the technology implementation. As the program progressed, lower-functioning individuals, such as dementia patients at the Benjamin Rose Adult Day Care facility were included. If the project were to be continued through additional sources of funding, museum staff has developed techniques on how to include even more individuals of lower-functioning abilities.

Yet despite, or in some cases perhaps because of, the high degree of pre-existing interests, these participants found the programs to be meaningful, fulfilling a need that had not been previously

met. The programs allowed the participants to feel connected to the Cleveland Museum of Art and other cultural institutions, even when they were no longer easily able to attend any of those institutions. Participants frequently made mention of the Museum, asking questions about conservation techniques, physical location of objects within the Museum, and collection strengths. Interviews with the participants demonstrated their increased connection with the museum, including feelings of ownership. This led participants to make statements such as “Our museum has a great collection...” or “We have in this town expertise in...” These statements reflect a sense of belonging to the museum, being part of the museum in some way, even if the speaker was not currently a regular Cleveland Museum of Art visitor. This was an unintended outcome of the project, but clearly a beneficial one to both the Museum and the participants, as it promotes connection between the institution and an often-underserved public.

One challenge in providing meaningful content is that the audiences served by this program are quite diverse. Judson Manor and Judson Park both served individuals who were more independent, those who need assistance, and those who are in nursing care. These individuals tended to be fairly intellectual, with strong cultural ties and the opportunity for a wide variety of activities. McGregor Home also served active adults, although their population was older and had a higher representation of those in nursing care. Lorain County Community College served younger retirees, who live separately, had their own transportation and experience the broadcasts in a classroom setting. Abington Arms served yet a different population of generally younger adults. As in most public urban residential facilities, the residents were racially diverse, of a lower socio-economic level and include some that were physically disabled. Yet these residents also had a wide range of interests from church activity to listening to Opera or Jazz music. Participants in the CCBMR or Benjamin Rose adult-care programs included those with a wide range of physical and mental abilities, as well as age. These adults were in a more classroom-like setting, sharing common activities during the day and returning at night to individual homes. Individual homebound participants had very different social situations than the rest of the participants.

The program rose to the challenge of such diverse audiences in a number of ways. Program staff made an effort to remain in frequent contact with both the activities coordinators and the participants themselves. Staff solicited feedback and commentary from the audiences and readily and rapidly adapted format and content to provide a better experience. As mentioned earlier in the report, Museum staff have developed “niche” programming in order to serve the particular needs of audiences that varied dramatically in physical and mental capabilities.

Audiences at most sites were fairly small. Due to the experimental nature of this program and the innovative technology in use, it would be inappropriate to evaluate the success of the program based on the numbers of people served, as this program was artificially limited from the beginning. With more stable technologies available from the onset of a program, any new projects would have more freedom to address lower-functioning audiences.

Use of the Technology

All sites reported that there had been initially both technological and logistic issues to be straightened out. These difficulties were overcome at all of the sites during the duration of the project, although should the project be continued in another funding cycle, clearly improvements can still be made.

For example, video on-demand, allowing participants to choose past programs of their own interest and view them at their leisure, proved more difficult to arrange logistically, and was not available to many sites until near the completion of the grant. This feature would allow participants to further pursue their own interests at a time of their choosing, which could make it very attractive for residents of facilities similar to Abington Arms, who are often occupied during the day. In addition, this would encourage participants to familiarize themselves better with the physical equipment, so that they are able to operate the on-demand programs on their own. As use of the equipment was a barrier at some sites, any future program that attempted such on-demand technology would need to provide the front-end training and support to increase participants' technology comfort-level.

Whether or not the participants were computer literate, the overall feeling among the majority of participants was that interacting with the technology hardware itself was the job of the program or activity coordinator, not the job of the participants, who were there to enjoy the content and ask questions. The activity coordinators tended to take on the role of intermediary between the broadcast presenters and the participants. Instead of forcing the participants to work with the computer, they focused their energies on encouraging questions and interaction among the group.

It was the intention of the museum staff to enable and facilitate the participant's interaction with the technology itself as the program became more established. There was evidence that participants at several sites make use of the computers and other equipment during non-program time, thereby building computer technology skills. This was somewhat dependant on both the interest of the participants and the direction of the activity coordinators. For instance, at the Benjamin Rose Adult Day Care Facility, use of the cordless keyboard and mouse proved to be a good way to learn computer skills for their clients.

Program Format and Logistics

The personnel involved in the program, both at the Cleveland Museum of Art and at the participant sites, were key factors in the program's success. Participation at most sites, with the exception of Lorain County Community College, needed to be recruited through the activity coordinators, using calendars, verbal reminders, and at times literally fetching people to come see the broadcast. As the activity coordinators were the conduits to the programs, the program rested on the shoulders of their participation. This worked well when the facility has one or more enthusiastic and engaged activity coordinators.

Participants expected to see a professional production-quality program, such as one associated with a high-quality television program, similar to a NOVA program on art. They had difficulty

understanding that the broadcasts relied on very new technology and thus did not provide the look and format of what they might expect to be on television. In some ways, it is a credit to the project and the hard work of the personnel to produce sophisticated broadcasts that the technology was taken for granted by the participants. Program personnel were extremely responsive to feedback and directly solicited information from the participants about improvements. As these improvements occurred over time, participants spoke of the improving quality of the show and their increased satisfaction.

Participants from several sites stressed that they liked to see lots of examples within a program, for instance, examples from a particular time period or of the artist discussed. Early on participants felt that too few examples of artwork were shown during a broadcast, but later indicated this issue improved over time. Participants preferred to have a “full immersion” experience, indicated by requests for extra examples of subject matter to be shown on screen during the break, as well as requests having topically-related music during the break.

Improvements included titles on the screen, use of the telestrator to point out specific elements of pieces, and increased use of examples. Participants also provided feedback on which art museum “guests” they found to be skilled and interesting presenters, and those personnel made more frequent appearances.

Several of the activities coordinators at the sites had concerns or questions about the format of the question breaks. Some felt the time allotted was too long; others felt that it was too short. Lorain County Community College, for instance, felt that question session would work better for them at the end of a program rather than the beginning. The participants there felt they would have better questions to ask at the end of program rather than halfway through it.

Content

Program Type

Overall feedback (gathered both from questions asked and from interviews) on the program content was quite positive. Participants were interested in the content and pleased with the presentation. Part of the success of the content provided was dependant on the responsiveness of the Museum to different constituent needs. In the end, four separate types of programming were broadcast. The key seemed to be that different audiences needed a different mix of more traditional art history versus process-focused hands-on art classes.

Those in the traditional retirement facilities, such as Judson Park, Judson Manor and McGregor House, as well as LCCC and to some extent the home-bound individuals, seemed to appreciate learning about art and art history. There was less interest in the more studio-based classes, and the students at LCCC seemed offended by these classes and assumed (incorrectly) that the material might more appropriate for nursing homes, but inappropriate for their students, as most were college graduates. These students (and the ones in the traditional retirement facilities) wished to review the traditional canon of art and explore the meaning of the terms, the symbolism and the socio-cultural context of the works. “The World of Great Art” broadcasts

were successful with this group. This group was also interested in programs on special exhibitions and insider tours of the Museum.

Even in this high-functioning group, the first broadcasts were more advanced content-wise than some of the audience was able to handle. Definitions of terms and periods such as “Zen” and “Islamic style of art” proved necessary for participants. Program hosts were adept at refining the tone of the broadcasts so that they could provide all of the relevant information needed in an accessible manner without appearing patronizing or simplistic.

On the other end of the spectrum in terms of content were the adults at CCBMR. These adults were at lower-functioning capability. They were not generally interested in art history, symbolism and the contextual nature of the art; instead they wanted to create art themselves. The studio sessions were much more successful than the other type of sessions, allowing students to focus on their own creations at the host’s direction. Activity coordinator interviews indicated many students blossomed in this format, developing increased art skills, as well as attention span and focus. They very much enjoyed the studio sessions, looking forward to the broadcasts throughout the week.

The other facilities seemed to benefit from formats that mixed both the content-based broadcasts with the studio-based classes. The key element to success with these audiences seemed to be the ability to make personal connections to the material. For instance, interviews with the site coordinators revealed the participants the Benjamin Rose Adult Day Care were fascinated by the program on Vincent Van Gogh, because Van Gogh was a great artist who nonetheless suffered from mental illness. They felt they could relate to Van Gogh and appreciated the opportunity to have a “hero” who had a mental illness. Both the Benjamin Rose Adult Day Care and Abington Arms appreciated programs with African-American or African ties, so that the participants felt stronger ties to the material. For these audiences, the studio element of the broadcast was appropriate and well-received, but unlike CCBMR, needed to be tied into their personal lives, whether through activities in the art room, or relating to their personal context.

As would be expected, content choices clearly appeal to some participants more than others. One set of comments focused on the time periods selected for programs, with participants *indicating they preferred content from their own generation over modern art*. For instance, one man at Lorain County Community College walked out at the beginning of a broadcast on artist Jackson Pollack, because he felt the work shown “wasn’t art”. Yet despite this comment, other evidence, such as the extremely well received program on Chuck Close, indicates compelling material of any generation can make a successful program.

Programs from content partners other than the Cleveland Museum of Art were largely successful. Participants did heavily identify the broadcasts with the Museum, increasing some confusion when the material originated from another provider. Broadcasts about the Dancing Wheels, a group of wheelchair-bound dancers was very well received among some and seen as irrelevant or not-interesting to others. Programs that focused on the Cleveland Orchestra were quite well-received.

Engagement and Interaction

Overall, the participants in the program felt that they have been a part of the cultural life of Cleveland, and this program enhanced their sense that they are still part of the community. This chance to have “insider information” as one activity coordinator called it, allowed visitors to have a cultural experience without leaving the room.

In order to better understand participant engagement, the transcripts of the questions asked during the live broadcasts were logged and sent to be reviewed at the Institute. Question data was analyzed from questions from September 2001 to June 2003, a total of 912 questions. Although the vast majority of the questions were obtained, technical difficulties prevented the capture of a few months of data. Table 1 presents the number of questions per month.

Table 4: Number of Questions by Month

Month and Year	Number of Questions
May 2001	15
June 2001	3
September 2001	7
October 2001	52
November 2001	10
December 2001	34
January 2002	75
February 2002	65
March 2002	21
May 2002	54
June 2002	21
July 2002	26
August 2002	34
September 2002	67
October 2002	40
November 2002	49
January 2003	18
February 2003	69
March 2003	110
April 2003	88
May 2003	22
June 2003	32

These questions were analyzed into categories and by question content and then into 5 different categories. The largest single category (59%) consisted of content related questions. Other categories included one of reporting technical difficulties or testing the system (14%), a category of questions and comments about the program format (8%), and a category of personal

comments and noting who was attending the broadcast (8%). Two other types of questions were identified and placed in categories, one of the questions related to instructions for a studio-based class (4%), and another of legible comments reflecting a great program (5%), which the participants had especially enjoyed.

Table 5: Types of Questions Asked During Live Broadcasts

Type of Question	Percentage of questions
Content-related	59% (n=536)
Reporting Technical Difficulties/ Testing of Equipment	14% (n=124)
Program Format	8% (n=71)
Personal Talk/ Hi, We're here!	8% (n=71)
Great Program!	5% (n=47)
Studio Class Questions	4% (n=34)
Unknown	3% (n=29)
Total	100% (N=912)

In order to further demonstrate the type of question that fit into each category, examples for each are given in the table below (Table 3).

Table 6: Examples of Each Category of Question

Type of Question	Example
Content-Related	"Were these paintings on canvas, or were they on some sort of textile?"
Reporting Technical Difficulties/ Testing of Equipment	"We lost sound? Is it you or us?" "Possibly you could type out the names of the artist in order to learn better? We would like to know how to spell their names."
Program Format	"Kelly, could you please speak to Marshall? He would just love it. Thanks."
Personal Talk/ Hi, We're here!	"Very informative, they are really enjoying it and don't have any questions right now!"
Great Program!	"Kevin would like to know how many times you can rework the fabric?"
Studio Class Questions	"Yes, they are the ones"
Unknown	

Content based questions were further analyzed and coded to look at the nature of the participant's thoughts during the broadcasts and a rubric of these types of questions was developed. In many program or exhibition evaluations, questions asked about the art are placed in a hierarchical rubric, with certain questions judged as having greater thought and depth. In the analysis of these particular questions, it was determined that a hierarchical rubric did not

adequately explain the intellectual activity occurring. Since subject matter of the broadcasts varied widely and participants could ask an unlimited number of questions, and often these questions built on information from other questions, other information mentioned during the broadcast and previous broadcasts, a rubric that categorized without valuing one type of question over another was needed.

The rubric that was developed broke the types of questions into six categories, which were description-based, process-related, art history, collections-based, personal connections, and evaluations and judgments. The first category, description-based questions, included questions asking what something was, where it was located, size, what it was made of, asking for titles and more information. Examples of these questions include:

“Where is the Sarah Benedict House located?”

“Do we know the age of the final pot presented on a slide?”

“Can you explain the picture of a man’s half front face against a grey/white background?”

“How big are these prints you are showing?”

The category of process-related questions included all questions asked about the creation of the art and about the artists themselves. These included questions about how the item was made, how long it took to make, why the artist chose that content matter and others. Some representative examples of these types of questions include:

“What pigments were used to paint the coffin? The colors have lasted a very long time.”

“How old was Monet when he died?”

“The figures on the top were they carved on the roof or brought up?”

“Did Washington pose for the Peale portrait?”

“Was the artist politically involved in more than just her art work—Did she speak on behalf of different causes?”

The third category of questions contained all questions relating to art history, the theories of art and questions about the socio-cultural context of art. These included questions about symbolism of particular pieces. Several of the questions were holistic in nature, where participants attempted to place the broadcast in a larger context, or historical in nature, where participants sought to understand the time period. Samples of this category of questions include:

“Who do you consider the most influential women artist of the past century?”

“Another point of clarification...were the Salon paintings called that because they were painted in the salon?”

“Regarding the painting of a church scene: Could there be a social commentary here? Something to do with class differences--the disapproving woman appears to be somewhat affluent.”

“At what point did pointillage come into fashion? Was it considered modern art?”

“What pharaohs were in power at the time?”

“Connie is not familiar with the story portrayed in the last painting...is it basically the conflict between good and evil and good prevailing?”

Collection-based questions dealt with issues surrounding the purchasing, conservation, and display of works of art. These questions primarily concerned issues of the collections at the Cleveland Museum of Art, but occasionally also referred to other institutions. Representative questions of this category include:

“How did the museum decide where and how to arrange the exhibit effectively on permanent exhibits?”

“What US museum does have the best Islamic collection?”

“How many Islamic pieces does the CMA own?”

“Who decides if a piece is worthy of being in the museum and is good art? And if it is a curator, would other curators probably agree?”

“The room with the picture of the cardinal in it, we would like to know where in the museum is that room?”

“I enjoyed the realism in the wooden sculptures. Regarding the fountain---was there any surface treatment to aid in preserving it?”

The participants also asked questions or made statements that indicated their personal connections to the content being broadcast. This might take the form of statements about viewing the art in person, visiting the location of the content material, or relating a memory. Samples from this category of questions include:

“We have memories of attending Children Concerts in which we had to pay only \$0.25.”

“That Structure is called Serpentine Mound. I have been there!”

“Tom Kennedy has been to Lawnfield many times and was the President of the Board Clara Upson has been to Lawnfield before the 90's. Others have been to the Cemetery Monument.”

“Just to let you know that Ruth brought us pieces of work to look at.”

A related but separate category to personal connections was the category of statements of personal evaluation of the art work. Participants shared their judgments in a variety of ways. Some of their comments in this category include:

“I happen to like Dvorjak.”

“Why is Jackson Pollack so messy?”

“So glad you presented a piece of work from The Gilded Age exhibit--what a beautiful exhibit it is!”

“But the ladies are confused as to why the green shelves are considered art?”

The questions were sorted into the above described categories (See Table 4). Interestingly, the greatest number of questions (34% out of content-based questions) fell into the art theory and history category. The second largest category (23%) was the process-related category, followed by description-related data (20%). Collections-based questions made up 10% of the total content-based questions. The last two categories personal connections and evaluation questions/judgments consisted of 8% and 5% respectively. It should be noted that these questions are only reflective of the questions that were sent to the hosts during the broadcast. More comments were made during the sessions among the participants than were sent to the hosts. Personal stories and memories as well as opinions of the art work were observed to be shared among those viewing the broadcasts, but not sent on to the hosts.

Table 7: Types of Content-Based Questions

Types of Questions	Number
Art Theory and History/ Socio-Cultural context questions	34% (N=180)
Process-Related Questions	23% (N=125)
Description	20% (N=106)
Collections-Based Questions	10% (N=53)
Personal Connections	8% (N=41)
Evaluation questions / Judgments	5% (N=28)
Total	100% (N=533)

As the rubric developed demonstrates, we hesitate to make value-judgments about the questions asked in terms of intellectual engagement. For a cognitively-impaired individual to ask about title or size of a work of art might indicate a significant high-level question in the context of that individual's abilities. Still, as noted above, the majority of the question moved beyond the fact seeking level, to a level of building connections. If we were to look at the data through the filter of a learning theory such as Bloom's taxonomy of the cognitive domain¹, we would be that many of the questions asked in this program would be considered "higher-level".

Bloom's taxonomy of the cognitive domain is thus:

1. *Knowledge*: Remembering or recognizing something previously encountered without necessarily understanding, using, or changing it.
2. *Comprehension*: Understanding the material being communicated with necessarily relating it to anything else.
3. *Application*: Using a general concept to solve a particular problem.
4. *Analysis*: Breaking something down into its parts.
5. *Synthesis*: Creating something new by combining different ideas.
6. *Evaluation*: Judging the value of material or methods as they might be applied in a particular fashion.

As we go back to look at several of the example quotes provided earlier, one can see that the questions asked would fit into these categories.

Comprehension: "Another point of clarification...were the Salon paintings called that because they were painted in the salon?"

Application: "Who decides if a piece is worthy of being in the museum and is good art? And if it is a curator, would other curators probably agree?"

Analysis: "Regarding the painting of a church scene: Could there be a social commentary here? Something to do with class differences--the disapproving woman appears to be somewhat affluent."

Synthesis: "What pharaohs were in power at the time?"

Evaluation: "But the ladies are confused as to why the green shelves are considered art?"

The detail and the depth of these questions clearly demonstrated active intellectual engagement by the participants, whether they were interested in how the movements of art fit together, how

¹ Woolfolk, Anita E. Educational Psychology Fourth Edition, Allyn and Bacon, Needham Heights, Massachusetts, 1990

the art was created, or how it related to their own lives. These individuals spent less time asking about titles and size and more time asking questions that one might expect to see in a college-level art history course. The ability to make connections, both to other broadcasts, to other periods in art, to historical events at the time and to their own lives was a key indicator of project success.

Interaction data was provided through evaluation forms filled out by activity coordinators, and telephone conversations with the coordinators and site visits. Those data collectively demonstrate that residents continued to think about the content presented after the broadcast is over. At times, earlier broadcasts were discussed again by participants at a meal, or as one activity coordinator mentioned, during exercise class. These conversations revealed connections between the broadcasts and other facets in the participant's life, such as reminiscences of childhood events, past cultural experiences in Cleveland or elsewhere, or previous interactions with artists and artwork.

Personal Connections

The popularity of the program staff was partially a testament to the successful implementation of the project. Any project that is heavily dependant on technology to function risks failing from the very beginning, due to problems with the technology overtaking all other concerns. This risk was even greater in a project such as this, where the technology was fairly experimental. Despite issues with the technology upon start-up, the program has overcome those issues and progressed to the next level of potential communication failure- the actual interaction with the Museum staff via the broadcasts. The program has succeeded at the technological level, and then again at the level of personally connecting with the participants.

Hosts Colleen Cross and Kelly Williams, through their site visits and during broadcasts, became very important to the participants at many of the locations. These personal visits were critical to the program as in its starting phases, in order to smooth out logistical issues and to "jump-start" participation. Through their personal magnetism they were the *Lifelong Learning and the Arts* program to some of the participants. Unavoidably, such personal attention confounds the analysis on some level, as it becomes more difficult to attribute participant change to the broadcasts, rather than the personal interaction with the hosts.

Nevertheless, the connection with the "broadcast personalities" demonstrates a subtle indicator as to the success of the program. As the technology became more and more reliable, in a sense more transparent, it became the person to person connections that rose to the surface. Several sites reported that having a visit from one of these two women was "like a celebrity coming to visit", generating a very high level of excitement and affection among the participants. The hosts would make a concerted effort to acknowledge the participants by name and/or site on the air, generating a feeling of belonging and community among those watching. Activities coordinators also reported they enjoyed working with each of the women for a number of reasons, including the fact that the hosts were very receptive to input.

Conclusions and Recommendations for Program Replication

The Lifelong Learning and the Arts project overcame its early technological hurdles to provide meaningful content to its audiences and served as model demonstration of content delivery to non-traditional audiences. Those served by this program already had a great deal of personal interests and previous knowledge when they entered the program. These participants were by and large engaged with others and the world at large. Overall, the participants interviewed had high life satisfaction scores and reported little to no loneliness. Yet despite, or in some cases perhaps because of, the high degree of pre-existing interests, these participants found the programs to be meaningful, fulfilling a need that had not been previously met. One indicator of the intellectual effort this program generated is the richness and diversity of the questions participants asked during the broadcasts.

The Lifelong Learning and the Arts project had two main goals- to stimulate intellectual engagement and facilitate social interaction. The program stimulated intellectual engagement in a variety of ways across a diverse population set. The project was successful, though somewhat less so, at facilitating social interaction among the participants. Different sites expressed these project benefits in different ways. Although the program at CCBMR seems to be intellectually engaging and promotes other unintended benefits, such as increased focus, it does not necessarily promote interaction among the participants. Yet increased interaction is in evidence at other sites from conversations, actions and relationships between the participants.

An unintended, though valuable benefit, was the sense of increased identification with the Cleveland Museum of Art. The participants in this program felt that they have been a part of the cultural life of Cleveland, and this program enhances their sense that they are still part of the community. This chance to have “Insider Information” as one activities coordinator called it, allowed visitors to a cultural experience without leaving the room. The statements made by the participants indicated that they felt a sense of ownership.

One challenging aspect of this program and other programs similar to this is gauging the type of programming needed. In the TOP program, those expecting a more typical class-like experience, such as those participants from Lorain County Community College, were most receptive to a class-like structure, like the “World of Great Art” programming. On the other end of the spectrum, lower functioning individuals such as the clients at CCMBR blossomed under a studio-arts classroom setting.

Another challenging aspect to the program was some participants had unrealistically high expectations as to production quality, both in terms of the technical quality of the picture and in terms of the overall production values. Some participants felt that the broadcasts would look and feel like television program, such as a NOVA or PBS program, and were disappointed when this expectation was not met, especially initially. Program staff were aware of this expectation and tried to counter it by emphasizing that the project was an experiment, with experimental technology. To some extent, the program’s success at individual sites was related to how well

the activities coordinators internalized this message. In the future, this may become less of an issue as advance in technology in the past three years have had enormous impact on the look and feel of content delivery.

Engaged activities coordinators were critical to the success of the project, and those sites that did not have activities coordinators, including the homebound individuals, were slightly less successful. The activities coordinators function not only to generate and maintain interest, but also to work as technology coaches and conversation facilitators.

If one were to replicate the Cleveland Museum of Art's Lifelong learning and Arts program, there are a few key things to consider.

- Audience. Is this an audience that would appreciate a historical view of art, or would they prefer studio art classes? Do the classes need to be chronological, or would it be better to tailor specific classes with a "hook" that the audience can relate to? Those who would seek to replicate this program should carefully consider the audiences they intend to reach. It is easier to provide content to homogenous audiences (for example, only dementia patients) where less time needs to be devoted to content creation, than to heterogeneous audiences such as those served by this program, including both seniors and young adults, higher and lower functioning individuals and persons of all income and interest levels, where content needs to be developed for each audience.
- Maximum benefit. Due to the experimental nature of this program and the innovative technology in use, it would be inappropriate to evaluate the success of the program based on the numbers of people served, as this program was artificially limited from the beginning. With more stable technologies available from the onset of a program, any new projects would have more freedom to address lower-functioning audiences. Future programs will need to be strategic in their thinking about which audiences they may wish to serve. Each of the sites in this program was made up of underserved audiences who benefited from the project; yet the sites were far from homogenous. It may be cost-effective in the future projects to choose one or more "sub-niches" from within these audiences.
- Fostering additional outcomes. One of the truly beneficial unintended outcomes of this project was the participants' increased sense of identification with the Museum and with the community as a whole. Participants gained a "Right here in Cleveland, our museum has...." outlook. If a future program were to incorporate more geographically distant areas, thought should be given towards how to foster community links, perhaps by tying some programming to local institutions.
- Personnel, both internally and site-specific. Once the technology becomes the norm, the project success rests on the personnel involved, both at the originator site, in this case the Museum, and at the participant sites. Committed and responsive personnel are crucial at both places. On the museum's end, one should be careful not to underestimate the power of the personal magnetism of the hosts. Just as some television programs are successful

and others with the same formatting are not, success for these broadcasts can be dependent on the nature of the broadcast hosts.

As a program grows in size larger than the one documented here, it will become difficult to guarantee the capabilities and enthusiasm of the hosts without specifically monitoring those variables. Since both of the key outcomes, social interaction and intellectual engagement are dependent on the coordinators at the receiving end, it may be in the originator's best interest to screen sites based on availability and commitment of the personnel. Future programs may consider *offering an initial first broadcast just for the activities coordinators, in order to train them on how to response to broadcasts and facilitate discussions among their participants.* With video-on-demand technology, this broadcast could be viewed repeated by coordinators in order to ensure a quality program.

A secondary impact of a larger program would be the difficulties in making the personal connection over air-time. Residents at CCBMR especially benefited *from hearing themselves acknowledged on the broadcasts.* If a future project were to be much larger yet include this same type of audience, methods need to be devised to retain that sense of recognition from the hosts.

- Understanding of the medium. Although one would expect technical issues such as picture quality to be slowly resolved over time in future projects, both participants and coordinators in future projects need to understand the fundamental nature of the programs: Broadcasts are not television, and will not look or feel like television. Instead, they provide additional capabilities that television can not provide, such as interaction with the hosts. Understanding the nature of the program will allow participants to both enjoy the programming more and also take fuller advantage of the capabilities.

The Lifelong Learning and the Arts project should be used a model of content delivery to non-traditional audiences, increasing participants' quality of life. With the continuing state of developing technology and the foundation developed in this project, future programs could be developed for a wide-variety of audiences, increasing life satisfaction and forming both personal and community-wide connections.



IT done.

Cleveland Museum of Art

Lifelong Learning Technology Summary

Keane, Inc.
Great Lakes Branch
March, 2003

Prepared By:
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CMA Lifelong Learning Technology Summary

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Technology Evaluation Summary

Project Background

The Cleveland Museum of Art (CMA) was awarded a Technology Opportunity Program (TOP) grant from the U.S. Department of Commerce in the Fall of 2001 to implement a long distance learning program related to Lifelong Learning and the Arts.

CMA has a long, strong history of delivering extensive educational programming and developing close ties with the community. As an institution established "for the benefit of all the people forever," key strategic goals established by the Board of Trustees include: "To create a rich and diverse educational and public programs that serve and engage many different audiences and communities in an innovative and dynamic fashion," and "To become a national leader in the use of new and emerging technologies to enhance the value to society of the museum's collections, intellectual initiatives, and other activities." Based on these principles CMA found themselves uniquely positioned to undertake the "Lifelong Learning and the Arts: Cultural Programming for Senior and Mobility-Impaired Populations" project.

The goal of this program is to enrich the lives of seniors and disabled adults through extending the arts programming to where they live and congregate via broadband technology. To date this enrichment has been provided by accomplishing the following objectives:

- o Development of an art program that provides a mechanism for intellectually stimulating older adult learners.
- o Development of an interactive, art-based program that facilitates social engagement among older adult learners.
- o Development of an interactive medium that can reduce the social isolation associated with living in senior care facilities.
- o Development of a replicable model that can be used by other cultural organizations seeking to deliver comparable content to similar populations via broadband technologies.

Since the Spring of 2002 CMA, and its content partners (see Appendix B), have developed and delivered high quality video-on-demand and live interactive programming, with web-based content to a small, manageable sample of older persons and disabled persons. There has been over one hundred arts related program broadcasts made available to the participants. The selected participants represent the various types of sites: private homes, assisted living facilities and community-based centers (see Appendix A for specific institutions) targeted by the program.

The program broadcasts completed thus far have been delivered one of four ways:

1. Video on Demand of archived broadcasts, lectures and documentaries.
2. Video on Demand with access to web based content to complement the broadcast.
3. Live Broadcasts originating from the CMA.
4. Live Broadcasts with the ability to interact on-line.

Note: All live broadcasts have been taped and archived so participants can view the program at their convenience.

The technologies deployed to support these broadcasts are discussed in the following section.

Planned Technical Roles and Responsibilities

Although the museum had solid experience in developing and delivering "traditional" video conference-based distance learning, a cross functional technology team was assembled to ensure program success (see Appendix C for company information and representatives). The selected technology partners provided core competencies that were congruent with their program roles.

APKNet Inc., the largest, most sophisticated ISP in Ohio provided network management and facilitated connectivity to selected participants. APKNet also provided facility space for co-locating the CMA IP/TV servers.

WVIZ/PBS, the area's local public television station was to manage the configuration of the IP/TV Control and Archive servers. This was to include downloading of archival material, the routing of broadcast programming emanating from CMA and WVIZ, as well as archive server and maintenance. *While WVIZ participated in the project their contribution was less than planned due to internal reorganizations related to merger activity.*

CISCO Inc. provided technical support to the project team members related to the IP/TV products. CISCO was also the vendor of choice for supplying the IP/TV infrastructure (e.g. servers, routers, software, etc).

Keane Inc. provided the technical evaluation of the implemented solution.

CMA managed the overall implementation process, which included the deployment of PCs and technology at the end user sites, and creation of the IP/TV content.

Technology Plan

The technology employed to deliver the lifelong learning programming was relatively new at the start of the project in September of 2001. The software and hardware selected were commercially available, innovative and unique in the way it was applied. These technologies were:

1. SDSL and T-1 lines to transport high bandwidth interactive content to program participants homes or facilities.
2. CISCO IP/TV turnkey high quality video-on-demand and live broadcast services (i.e. hardware and software) via CISCO Broadcast, Control, and Archiving servers.
3. CISCO Question Manager that allowed program participants to submit text of questions on-line to a moderator.
4. CISCO Slide-Cast that allowed PC-generated presentation material to appear alongside a live or archived broadcasts.
5. CISCO Web Presenter that allowed concurrent use of video and web pages for complementary and enhanced content.
6. CISCO Stream-Watch which enabled tracking of who and when participants were accessing programs.

CISCO's IP/TV product was chosen over other prospective solutions because it offered a more comprehensive set of features than any other product identified during the Summer/Fall of 2001. IP/TV provided a high quality full, or near full-screen video, that was vital for the audience of older and impaired persons. The implementation of a turnkey solution by a single reputable vendor added the advantage of one-stop training and support.

The baseline technology used in this project has continued to be enhanced and developed by CISCO. Many of the components utilized during this timeframe are no longer commercially available and have been replaced by newer products. *See Appendix F to review the new CISCO product offerings relevant to this project.*

Originally the project team anticipated experimenting with a digital wireless technology such as ITFS for an alternative delivery media. However, due to available bandwidth and infrastructure in the Cleveland area this technology was not implemented.

In addition to the above technologies the following components were also included in the overall technical architecture:

- Standard cameras, audio, and mixing equipment for recording and/or broadcasting content.
- Standard Internet PCs at participating sites with appropriate monitors and connectivity devices.
- Standard PC workstations for coordinating/editing/producing content for the Question Manager operating console.
- PC-anywhere or similar software installed at end user machines with modem connection for support.

Schematic diagrams illustrating the baseline (Fall 2001) and current (Summer 2002) technical architectures can be found in Appendix D and E respectively.

Technology Effectiveness Summary

Like any technology-based project the CMA Lifelong Learning project encountered startup and deployment problems. However, the majority of the startup problems were attributed to external factors outside the immediate control of the project team or sponsor. The collapse of the DSL industry during the deployment of the Lifelong Learning technology suite required reworking the planned telecommunications network. Selected DSL communications had to be replaced with T-1 lines. This propagated changes to modems, routers and copper wiring at both the broadcast and remote sites.

Since both the WVIZ/PBS and CMA technical staves assumed their respective roles and responsibilities without increasing head count, inherent delays were realized due to "normal business" priorities and demands. In addition WVIZ/PBS went thru a local merger with another PBS entity that resulted in significantly diminishing their role in the program. The CMA IT staff had to handle the residual WVIZ/PBS workload. All other technology partners continued to fulfill their roles as planned.

Once these obstacles were overcome the "live" broadcasting of content over the network was achieved using the documented technology. These broadcasts have been successfully recorded and archived for on-demand playback. However, changes to the base system configuration had to be made (i.e. deployment of a second PC/server at the CMA site) to stream live broadcasts to the archiving server. The configuration change was necessary since the broadcast server consumed all available machine resources in order to perform the broadcast. The archiving of broadcasts and other encoding activities were made using the defacto MPEG formats.

The Motion Picture Experts Group (MPEG) is a joint committee of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). MPEG is a codec, short for encoder/decoder, which means that MPEG technology is involved during both the compression and decompression of video. MPEG addresses both the audio and visual sides of video. Accordingly, each MPEG encoder must compress, and each decoder decompress, both audio and video content. There are three major MPEG standards: MPEG-1, MPEG-2 and MPEG-4.

- MPEG-1 is the most common implementation of the standard and provides a video resolution of 352-by-240 at 30 frames per second (fps). This produces video quality slightly below the quality of conventional VCR videos.
- MPEG-2 offers resolutions of 720x480 and 1280x720 at 60 fps, with full CD-quality audio. This is sufficient for all the major TV standards, including NTSC and even HDTV.

- MPEG-4 is a graphics and video compression algorithm standard that is based on MPEG-1, MPEG-2 and Apple Quick Time technology. MPEG-4 files are smaller, so they are designed to transmit video and images over a narrower bandwidth and can mix video with text, graphics and 2-D and 3-D animation layers.

Initially the "Video on Demand" (VOD) feature of the technology suite encountered problems and was not functioning consistently across the VPN. The problems related to how the content was encoded for broadcasting. Originally it was planned to transmit all content over the DSL and T-1 VPN using the MPEG-4 format. While the MPEG-4 content could be sent and received over the T-1 lines it could not be received at the DSL sites. After significant research at the local CISCO lab it was determined that the current setup at the museum was correct, but the way the recording was being made was incorrect. It was learned that the setting up of the program, or recording, must be done through the Content Manager. This ensures that the recording is successfully made and saved correct IP/TV settings for subsequent playback. The settings used to successfully record the programs were as follows:

- Audio/Video Bandwidth: 400
- Preferred Video Format: Other Video for Windows Codecs
- Compression Quality: 8
- Max. Video Frame Rate: 20
- Audio Format: MP3, 8000Hz, Mono
- Record to this file: This name can be anything you want it to be, but it must end in a .rtp

Despite these problems the technology was highly successful and allowed the Lifelong Learning project to be implemented as planned.

Program Implementation – Technology Review

Infrastructure Deployment Successes

Broadcasting and Encoding Technical Architecture Successfully Deployed.

The CISCO Broadcast and Encoding server (i.e. hardware/software) was implemented with minimal setup problems or issues at the targeted hosting sites (APKNET, Cleveland Museum of Art, and WVIZ/PBS respectively). In addition, the WVIZ/PBS Broadcast/Encoding servers were successfully integrated into the Local Area Network (LAN) and were utilized to broadcast local content over the WVIZ LAN.

PC Workstation Requirements Configuration.

The IPTV client software was successfully installed on the remote PC Workstations. The software was compatible with other desktop software and was easy to use. The broadcasted material was also successfully viewed using Microsoft's Media Player. However other multi-media software, such as Real Player was not tested due to known incompatibility issue at the time.

The baseline PC configuration was overall adequate for use at the remote locations. However refinements to peripherals such as enhanced graphics card, sound/speakers and oversized monitors (i.e. 32" – 35") were made to enhance the delivery of the content. The remote sites also used wireless keyboards and mice for maximum flexibility of use.

Lessons Learned.

The equipment has been fully deployed and placed into an operational status. At this time the selected distant learning hardware/software configuration is meeting the live broadcast expectations. The basic workstation requirements were sufficient to support the initial deployment. *Due to the uniqueness of the remote facilities and targeted audience, any future Program Sponsor should be prepared to refine the standard configuration to improve the effectiveness of the delivery media for a specific audience needs.*

Infrastructure Deployment Challenges

Baseline Network Infrastructure Reconfiguration Required

The initial DSL modems (at receiving sites) had to be replaced with more "network intelligent" CISCO routers to support Multicast programming and T-1 requirements. This was required since the original DSL modems did not have the capacity to support the multicast technology that was required for the live broadcasts. The deployment of the CISCO routers did not significantly impact the budgeted deployment costs at the affected locations.

Prior to deploying the hardware and software at the remote sites a physical walk through was conducted. The outcomes of the on-site inspections contradicted some of the information provided by the DSL vendor related to wiring compliance. This resulted in switching selected sites to a dedicated T-1 line since building infrastructure could not support DSL services without incurring extensive re-wiring. This was an unplanned activity since earlier discussions with telecommunication vendors indicated the wiring infrastructure was adequate.

The verification of DSL coverage areas also resulted in switching to dedicated T-1 lines since DSL services were not available as planned. Likewise, this was an unplanned activity since earlier discussions with DSL vendors indicated that DSL service would be available in the targeted communities prior to the planned rollout of the program.

In preparation for the broadcasts the IP/TV multicast paths were initially hard coded to ensure accurate and prompt delivery of the live broadcast signal. The multicast paths provided the locations (i.e. specific IP addresses) of the various routers, switches and PCs that were used on the VPN to deliver the broadcast material. However due to inconsistencies and problems with transmitting the content, the routers were reconfigured to be in "learn mode". The learn mode allowed the routers to calculate the optimal network configuration for transmitting the broadcast over the VPN. Once the routers were reconfigured in learn mode the related broadcast problems were eliminated. Typically, hard coding the IP addresses into the router is the standard practice for establishing a multicast path over a VPN. CISCO is still uncertain why this approach was unsuccessful and the less preferred "learn mode" had to be used to configure the routers.

In order to archive the live broadcasts during transmission an additional server had to be installed to record the event. This was due to licensing issues between IP/TV and MPEG.

Delays Encountered Related to DSL/Telecommunications Industry

Just prior to the planned rollout of the distant learning program the regional DSL providers underwent a shakedown that resulted in the collapse of multiple DSL vendors. This left some geographical areas without DSL service while sending many business scrambling for service. This event resulted in the need to reconfigure the network delivery mechanisms from pure DSL to a hybrid of DSL and T-1 lines. The ordering and installation of the T-1 lines had to be expedited within the Telecommunications Company, due to standard lead times related to T-1 installs. If the orders had not been expedited than further deployment delays would have been encountered.

A DSL line went down (no connection) and was undetected prior to being discovered at the remote site. The hosting site was questioned as to what type of network monitoring they perform to trap these types of error. They replied that ADSL circuits are not monitored, as it is a best-effort service from the phone company. The only visual indication would be the 'flashing' on and off that the circuit is down.

Hosting Site Encountered Power Outage

A system failure due to a server inadvertently not being on a UPS protected circuit caused a temporary system outage. The hosting acknowledged that was mistake on there side in not plugging it into the correct power grid. They moved the server after the failure and put into a dedicated UPS with line conditioning.

Lessons Learned

The end result of these changes was that the number of planned installations had to be cut back. Only institutions such as nursing homes and senior centers were implemented and all private residential home implementations were postponed. The use of DSL as a delivery mechanism was replaced via T-1 lines due to the issues mentioned above surrounding DSL infrastructure and its limited coverage area. *It is recommended that for future installations a physical site survey be conducted prior to ordering telecommunication lines and service.*

The collapse of the DSL vendors could not have been predicted, however such events are not uncommon when working with technology companies. The CMA IT staff and business partners responded quickly to minimize delays and impacts. *While it is tyvical for projects to include a contingencv/risk plan to mitigate external impacts it is often difficult to implemte these practices on an experimetal project such as here. However, this practice should be at least discussed on future deplovments and an approach for dealin_g with risk be drafted.*

The circuit and power outage problems are not unique to the technology deployed and are typical of problems encountered by Internet Service Providers (ISP). However had the ISP performed a formal backup and recovery test on the co-located equipment prior to the program launch these problems would have been avoided or minimized.

Program Execution – Technology Review

Program Successes

End User Training/Support

CMA technical resources assisted with on-site training programs to familiarize the senior citizens and program directors with how to properly setup and run the PCs. Specifically, scripts and notes related to “How To?” were prepared to simplify tasks associated with using the technology.

To minimize disruptions and delays during the broadcast a direct dial number “help desk” was initiated to handle trouble-shooting calls during the early broadcasts.

Live Broadcast and Archiving

Over 150 live broadcasts were performed and approximately 30 of these broadcasts were successfully archived during the transmission. The “Question Manager” software component was used extensively by the viewing audience to submit questions during the broadcast. The questions were received and queued at the broadcasting site for a response.

The questions were then read allowed by the moderator and answered by the subject matter expert near the end of the broadcasts.

Broadcast Readiness Verification and Supplemental Content

To minimize any problems during the broadcast a predefined test and checklist review was conducted 30 minutes prior to the program. In addition a live feed signal was constantly broadcast on a 24x7 time basis over the network to ensure connectivity.

Selected broadcasts were supplemented by a dedicated website that contained additional information related to the content of the broadcast. The website www.lifelonglearning.org also contained web links to other sites containing pertinent information. This combination of live broadcast and predefined Internet access provided an enriched learning environment. This allowed the participants to easily navigate to and locate pertinent information.

Lessons Learned

The selection and training of a “Local Site Coordinator” at each of the remote viewing sites minimized the number of technical issues and help desk calls. The execution of a standard pre-broadcast script or checklist helped identify technical problems in advance. This proactive approach provided a window of opportunity to correct problems and thereby avoid disruption to the scheduled broadcast. *Supplementing the video broadcasts with additional content, via a web based site was extremely effective for encouraging the audience to gain hands-on experience using a PC and Internet surfing.*

Program Challenges

Matrix Managed Technology Project

The nature of this project required a matrix based project team comprised of individuals from the various partnering companies, as well as various CMA departments. Initially, WVIZ/PBS was identified as the technical manager for the project. However, due to the lack of involvement by WVIZ/PBS an attempt was made to share this responsibility among the other technology partners. Subsequently the lack of a dedicated technical manager and resources resulted in delays in problem resolution during the startup and pilot phase of the project

The role of the technical manager gradually became the responsibility of the CMA staff. This role resulted in unplanned work for the IT staff and a best effort was made to support the project.

Video On Demand (VOD) Server

An unexplained problem related to the corruption of VOD server files caused proximity groups/servers to point to the wrong network. The resolution of this problem required multiple re-imaging of the VOD server.

The integration of VOD server with the www.lifelonglearning.org website was problematic. The initial encoding settings used to record content were not compatible with DSL/MPEG-4 transmission protocols. This prevented the remote DSL sites from being able to successfully request and receive the VOD MPEG-4 encoded files. The cause of this problem was determined to be related to licensing issues surrounding CISCO's IP/TV and MPEG-4.

Video Tape Transfer/Encoding and FTP to Content Manager Server

The CMA staff could not automate the capture/transfer of video tape to digital media. It was originally anticipated that the transfer of content from multiple tapes could be completed without manual intervention between each tape. However it turned out that each tape had to manually loaded and queued to the appropriate frame.

Problems were also encountered with transferring the encoded content from the recording/archiving server located at the CMA site to the broadcast server located at APK Net. The problem was related to how the File Transfer Protocol (FTP) settings were initially configured. In order to resolve this problem the settings were changed and the FTP service was reactivated

Vendor Technical Documentation/Training/Support

In retrospect the project team should have requested more technical training and support from CISCO. The lack of formal product training and documentation resulted in misinterpretation of software functionality, as well as multiple workarounds and reconfiguration. While CISCO made good faith efforts to provide ad-hoc training when requested it was only moderately effective.

Lessons Learned

There were a number of deployment issues encountered that impacted the overall project timeline. These issues had to be addressed as time permitted since all the project team members had full-time job responsibilities that were in force during this time. The overloading of key technical resources led to conflict within the project and subsequent delays.

Therefore it is recommended that during the implementation and pilot phase of the project a dedicated technical resource manager or team should be identified for managing/resolving issues. These resources

should be empowered to work across company and departmental lines. The technical team should complete formal training by the software vendor(s). This would lead to quicker problem resolution and enhanced communications between all parties. A problem or issue escalation process should be defined so that delays related to any issues can be minimized.

There should be more clearly defined roles and responsibilities among the various partners. These roles and responsibilities should be documented and agreed upon through formal partnership agreements

Appendix

Appendix A - Community Partners

Abington Arms/University Circle, Inc.

Contact: Susan Persing
Subsidy Administrator
11501 Mayfield Rd.
Cleveland, OH 44106
216-791-5025 216-791-0370 FAX
Telecommunication Type: DSL

Cuyahoga County Board of Mental Retardation

Contact: Ernest J. Markovic, Jr.
Manager, Adult Training Center
13231 Euclid Ave.
East Cleveland, OH 44112
216-681-1010 216-249-6926 FAX
Telecommunication Type: T-1

Judson Park/Judson Manor

Contact: Kristina Kuprevicius
Vice President of Marketing & Sales
2181 Ambleside Dr.
Cleveland, OH 44106
216-791-2436 216-721-2607 FAX
Telecommunication Type: DSL

Lorain County Community College

Contact: Eldonna Shields-Kyle
Program Coordinator, Center for Life Long Learning
1005 N. Abbe Rd.
Elyria, OH 44035
1-800-995-5222 x 7536 440-365-6519 FAX
Telecommunication Type: T-1

McGregor Home

Contact: Caroline Urban
Director of Activities
14900 Private Dr.
East Cleveland, OH 44112
216-851-8200 216-851-6634 FAX
Telecommunication Type: T-1

Benjamin Rose Institute

Community Services Division

Contact: Semanthie Brooks

2373 Euclid Heights Blvd.

Cleveland Heights, OH 44106-2797

216-791-8039 x410

Telecommunication Type: DSL

Appendix B - Content Partners

Cleveland Museum of Art

Colleen Cross
TOP Grant Coordinator
11150 East Boulevard
Cleveland, OH 44106-1797
216-421-7340 x2487 216-421-9277

Cleveland Orchestra

Joan Katz-Napoli
Director of Educational Programs
Severance Hall
11001 Euclid Avenue
Cleveland, OH 44106
216-231-7348 216 -231-8337 FAX

Western Reserve Historical Society

Tammy Brown
Director of Audience Development
10825 East Boulevard
Cleveland, OH 44106
216-721-5722 216-721-0645 FAX

Crawford Auto-Aviation Museum

Bob Voelker
Program Coordinator
216-721-5722 x315

James A. Garfield National Historic Site

Allison Sharaba
Program Coordinator
440-255-8722

WVIZ/PBS

Jean O'Malley
K-12 Programming Services Manager
4300 Brookpark Rd.
Cleveland, OH 44134
216-739-3848

Cleveland Botanical Garden

Pat Owen
Horticultural Therapist for Aging Audiences
11030 East Blvd.
Cleveland, OH 44106
216-721-1600

Inlet Dance Company

Bill Wade
Artistic Director/Founder
Cleveland School of the Arts
2064 Stearns Road
Cleveland, OH

Professional Flair, Inc./Dancing Wheels

Barbara Allegra Verlezza
Associate Artistic & Education Director 3615 Euclid Avenue, 3rd Floor
Cleveland, OH 44115-2527
(216) 432-0306

Appendix C - Technical Partners

APKnet

Matt Hallock
1621 Euclid Avenue
Suite 1218
Cleveland, Ohio 44115
(216) 241-7166
Telecommunication Type: T-1

Cisco

Dominic Vitale
5700 Lombardo Center
Suite 120
Cleveland, Ohio 44131
(216) 643-2463

Cleveland Museum of Art

Len Steinbach
11150 East Boulevard
Cleveland, OH 44106-1797
216-421-7340
Telecommunication Type: T-1

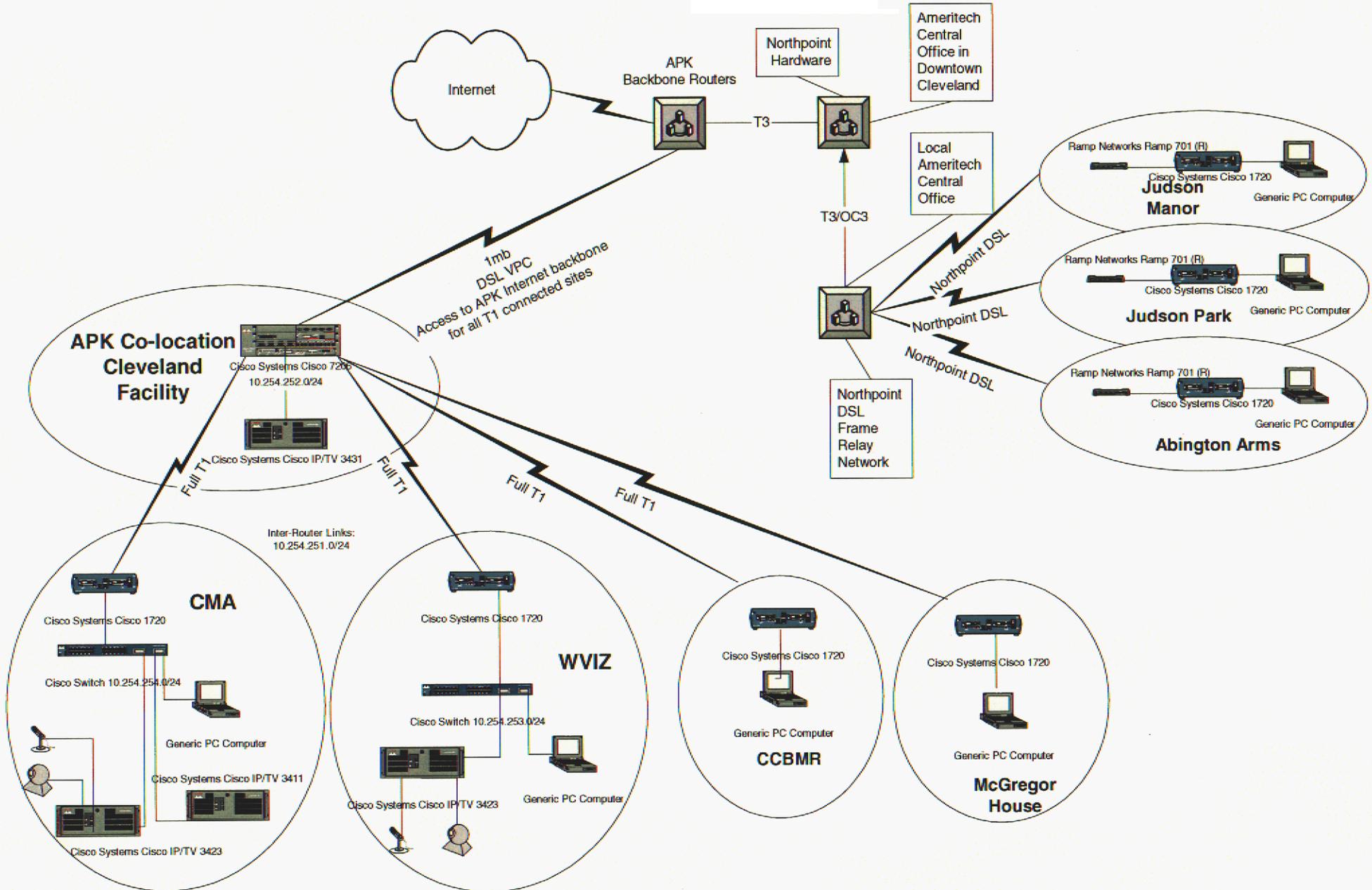
WVIZ/PBS

George Hoffman
4300 Bookpark Rd
Cleveland, Ohio 44134
(216) 739-3814
Telecommunication Type: T-1

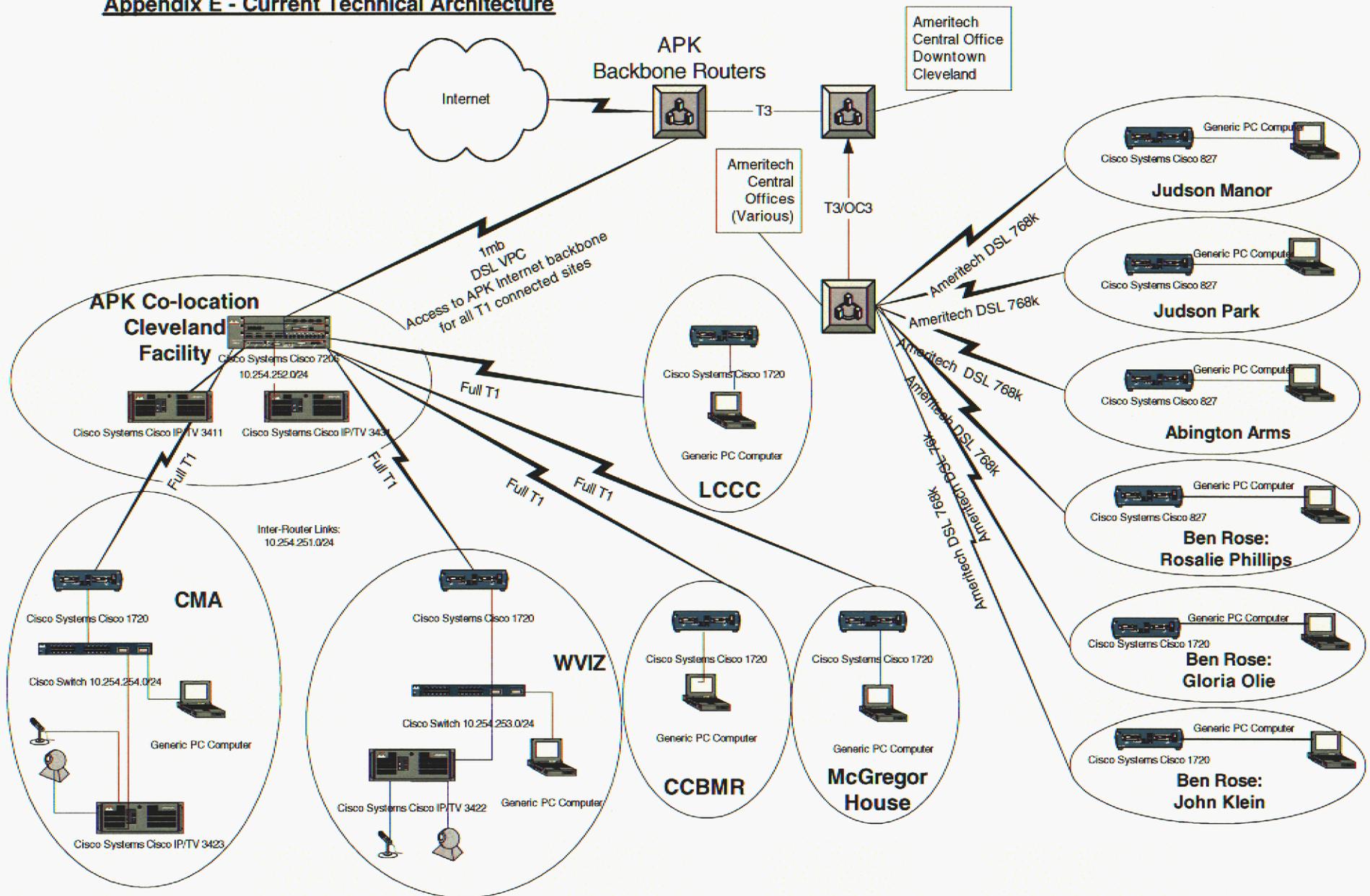
Keane, Inc.

Tim McClung
7271 Engle Road
Suite 307
Middleburg Hts, Ohio 44130
(216) 239-2440 ext. 114

Appendix D - Baseline Technical Architecture



Appendix E - Current Technical Architecture



Appendix F – CISCO End Of Sale (EOS) Notice

End-of-Sale Announcement for Cisco IP/TV Version 3.2 software and Cisco IP/TV 3424 Broadcast Server

With the release of Cisco IP/TV[®] Version 3.4, Cisco Systems announces the end of sales (EOS) for the Cisco IP/TV Version 3.2 software and Cisco IP/TV 3424 Broadcast Server. Cisco will continue development, sales, and maintenance of the IP/TV hardware and software product line. Cisco IP/TV Version 3.4, released in June 2002, replaces Cisco IP/TV Version 3.2.

Likewise, the Cisco IP/TV Version 3.4 software obsoletes the Cisco IP/TV 3424 Broadcast Server. The recommended replacement for the Cisco IP/TV 3424 Broadcast Server is the IPTV-SERV-MP4-3.4 software kit.

End-of-Sale Schedule

Customers can order the Cisco IP/TV 3.2 software through December 15, 2002, but are encouraged to purchase IP/TV Version 3.4 software instead.

With the release of Cisco IP/TV Version 3.4, the IP/TV StreamWatch software is included as part of the IP/TV 3.4 Content Manager, and is no longer sold separately. Customers can order the Cisco 3424 Broadcast Server through December 15, 2002, but are encouraged to purchase the IPTV-SERV-MP4-3.4 software kit instead.

All other IP/TV server products continue to be sold and supported as before.

End-of sale, end-of orderability:	December 15, 2002
End of software support:	December 15, 2005
End of life:	December 15, 2007

Cisco will continue to provide software enhancements through December 15, 2005.

Description and Replacement Product Information

The Cisco IP/TV product line offers an easy-to-deploy solution for high-quality, standards-based video delivery over enterprise networks. It is available as a hardware and software appliance, or as a software-only solution for deployment on standard Windows servers.

Customers using Cisco IP/TV 3.2 software-only products are encouraged to migrate to Cisco IP/TV 3.4. Cisco IP/TV StreamWatch software, previously sold separately, is now included at no extra charge in Cisco IP/TV 3.4 Content Manager software or the IPTV-3412-CTRL Control Server.

Customers with a need for the IP/TV 3424 Broadcast Server are encouraged to purchase the IPTV-SERV-MP4-3.4 software kit instead. Customers with existing IP/TV 3424

Broadcast Servers can upgrade to Version 3.4; however, some new features require more performance than is available on this model. The IPTV-SERV-MP4-3.4 software kit can be used on third-party servers running Windows 2000.

Recommended minimum CPU performance is a 1.5-GHz Pentium III processor or a 1.8-GHz Pentium 4 processor. Please refer to the Cisco IP/TV Version 3.4 product documentation for details at:

<http://www.cisco.com/nivercd/cc/td/doc/product/webscale/iptv/iptv34/index.htm>.

Table 1 describes the specific product numbers designated for end of sale.

Table 1 Cisco IP/TV EOS Products and Part Numbers

Part Number	Product Description	Replacement Product
IPTV-3424-BCAST-W	Cisco IP/TV Broadcast Server with Winnov AV card	IPTV-SERV-MP4-3.4 and third party server
IPTV-SERV-3.2	Cisco IP/TV 3.2 Server Software	IPTV-SERV-3.4
IPTV-CM-3.2	Cisco IP/TV 3.2 Content Manager	IPTV-CM-3.4
IPTV-START-HD1-3.2	Cisco IP/TV 3.2 Software Starter Kit	IPTV-START-HD1-3.4
IPTV-STREAM-WIN-1	Cisco IP/TV StreamWatch	Included in IPTV-CM-3.4 and IPTV-3412-CTRL
IPTV-SERV-3.2-UPG	Cisco IP/TV Server software upgrade to Version 3.2	IPTV-SERV-3.4-UPG
IPTV-CM-3.2-UPG	Cisco IP/TV Content Manager software upgrade to Version 3.2	IPTV-CM-3.4-UPG

End of Production Date

End of production is scheduled for December 2002. The new products supersede the old ones and fully replace them.

Last Software Support Date

The last Cisco IP/TV 3.2 software support date is December 2005.

End of Support Announcement

The end of support announcement is schedule for December 2005.

Date for Discontinuing Renewal of Contracts

Existing service contracts will be honored. Customers will be encouraged to upgrade to new systems. Contracts will not be honored beyond End of Support date of December 2005 for the software or December 2007 for hardware.

Obsolesion

The discontinued Cisco IP/TV products will be declared obsolete in December 2007.