

INTERACTION BETWEEN MUSICIANS AND AUDIENCE IN A LEARNING PROCESS ON THE INTERNET

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Abstract. This paper focuses on new possibilities for interaction between actors and audience both physically during performances and virtually on the Internet. The audience of future performances can be invited to send multiple original media elements to a virtual gallery. Professionals can select material from a specific audience and thereby give a unique performance based on this audience's original material.

The main goal was to investigate if computers and communication on the Internet could be used as a creative channel where many people could create new musical experiences together. Another aspect of the investigation was telepresence production within the project group working at a distance.

A test study was carried out in 1999 involving the Royal Institute of Technology, Sweden, the Norwegian Concert Institute and Gjøvik College, Norway, with the objective to analyze different aspects of using the WWW for preparing physical concerts. The audience of the coming concert was invited to send their creative material for the concert, such as text, images, video and music, to a gallery on the WWW. The audience counted 4700 students at 36 secondary schools in eastern Norway. The creation of original material was integrated as an important part of the learning process in several different educational programs in the schools. Professional musicians and a video artist analyzed the collected material from the WWW gallery and 36 unique concerts were given based on the material from the audience.

Two questionnaires, project documentation and recorded audio/ video material were analyzed for the purposes of this paper and several different aspects of the case are highlighted, such as;

- Different ways to interact on several levels both physically and virtually during the production.
- The audience's emotional experience of listening to its own produced material performed by professionals, seen from a learning point of view.
- Experimental installations for expressing physical and virtual performance spaces, when acting at a distance.
- Communication models and tools for project groups when working remote.

Keywords. : Virtual meetingpoint, Virtual gallery, Learning process, Composing, Lyrics, Concert,

1. INTRODUCTION

1.1 Introduction

The "Spindelnev@" project started in autumn 1998 and ended in Nov. 1999. It was financed by The Norwegian Concert Institute and carried out in close partnership with the Royal Institute of Technology (KTH), Div. Media Technology and Graphic Arts and The National Graphic Arts engineering program at Gjøvik College, Norway.

The main goal was to investigate if computers and communication on the Internet could be used as a creative channel where many people could create new musical experiences together. Another aspect of the project was the telepresence production within the project group working at a distance. "The Spindelnev@" project was based on results from an experimental scene project [1], [2], and research on telepresence production [3]. Together with a producer, Hogne Moe, at the Norwegian Concert Institute, an idea

was developed for an experimental model for field study. The audience of future performances was invited to send multiple types of original media elements to a virtual gallery on the Internet. Professional musicians and a video artist analyzed the collected material in the gallery and gave unique local concerts based on the audience's own originals.

1.2 Method

A meetingpoint site was developed on the Internet with functions like input delivery, library with search possibilities, real-time communication tools and various kinds of information including news and video on demand. The Internet and ISDN were used for instant communication between the project group members physically situated at 3 locations, Gjøvik, Hamar and Stockholm. Experimental concerts were carried out at 36 secondary schools with a total of 4700 students in eastern

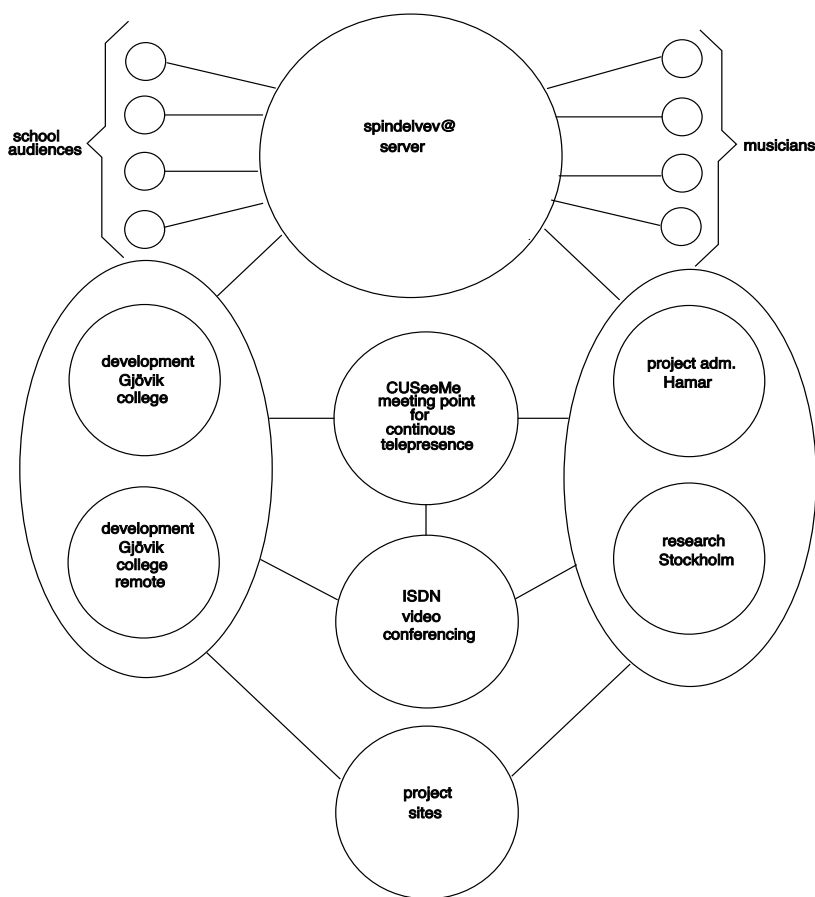


Fig. 1. Communication diagram.

Norway. They were physically visited by the producer, the musicians and the author of this report two times during the project period. At the first visit, students and teachers were invited to create material for the gallery and to visit the site. For this “invitation”, an experimental installation was developed for performance and project information. The second visit included a unique concert based on the local material sent to the gallery on the Internet. Written information material and freeware were handed out to the schools during the first period of the project. This was supported by information at the meetingpoint site.

Two interview studies were carried out in order to investigate technical resources, pedagogical aspects and the response from the students and teachers concerning the project. A local project administrator at each school summarized the student’s opinions on the questionnaire. The first interview study was conducted 4 month before the first visit in order to get a basic overview of the school’s connectivity to the Internet and the speed rate of the connection. Results from this investigation became the basic specification for developing the meetingpoint site on the Internet. The concerts were recorded and this documentary material was used for analyzing the project and edited for presentation and publishing. After finishing the final concerts, the second questionnaire was distributed

to get basic material for analyzing the experiences from the project.

This study focuses on the pedagogical use of the project in the schools and the experiences from the two performances. The interview studies will, together with the video documentation, be the basic material for the results and discussion parts of this paper.

2. NETWORKED PRODUCTION SYSTEM

The design of the Internet solution was a final project for a group of graphic arts engineering students at Gjøvik College, Norway. They were developing and programming the meetingpoint and project sites for the project group members on the Internet. The producer organized the project. He was updating the project meetingpoint site with news and information using templates developed for this purpose. An experimental mobile installation was developed at KTH, for the two periods of concerts. The research was done partly by following the project at a distance but also by doing field studies during the concert periods.

2.1 Working at a distance

The communication diagram, fig.1, shows the communication structure used during the development of the project. Most of the communication was based on virtual meetings using full screen video conferencing when stronger telepresence was needed and small format videoconferencing on Internet for continuous telepresence production. These tools were used together with communication tools such as ICQ, Email and telephone for daily use. The diagram shows the Spindellev@ server with the meetingpoint site for communication between the audience and the musicians. Both developers and project administrators had access to the server at different levels during the period of prototyping, testing and ordinary use. The CUSeeMe reflector [4], at KTH was used for multiple videoconferencing, primarily for continuous telepresence production to increase the communication quality within the group. The project sites were continuously updated as a "documentation library" for the project group.

2.2 The project sites

A student project group at Gjøvik College developed the

project sites. These were constructed for hosting meeting reports, email copies, documentation and prototyping models for evaluation. These sites, combined with other tools for the Internet and video conferencing, were the main project communication tools but the producer also held some physical meetings at Gjøvik for education, information and discussion. The graphic arts engineering students also had an important role in developing good functionality for the meetingpoint site in close contact with the producer and the researcher. A first questionnaire was distributed for mapping the audience access to Internet.

2.3 The first questionnaire

84 percent of the schools answered the technical questionnaires sent to the schools at the beginning of the project. Just one of the schools replied that they did not have access to the Internet. 5 schools had modem access at a speed of 28.8 Kbps and the other 20 schools had an access of 64 Kbps or better. 5 schools used only Netscape Communicator browsers and the others were using Internet Explorer or both the browsers. 4 of the schools did not have the possibility to digitalize pictures using scanner or digital

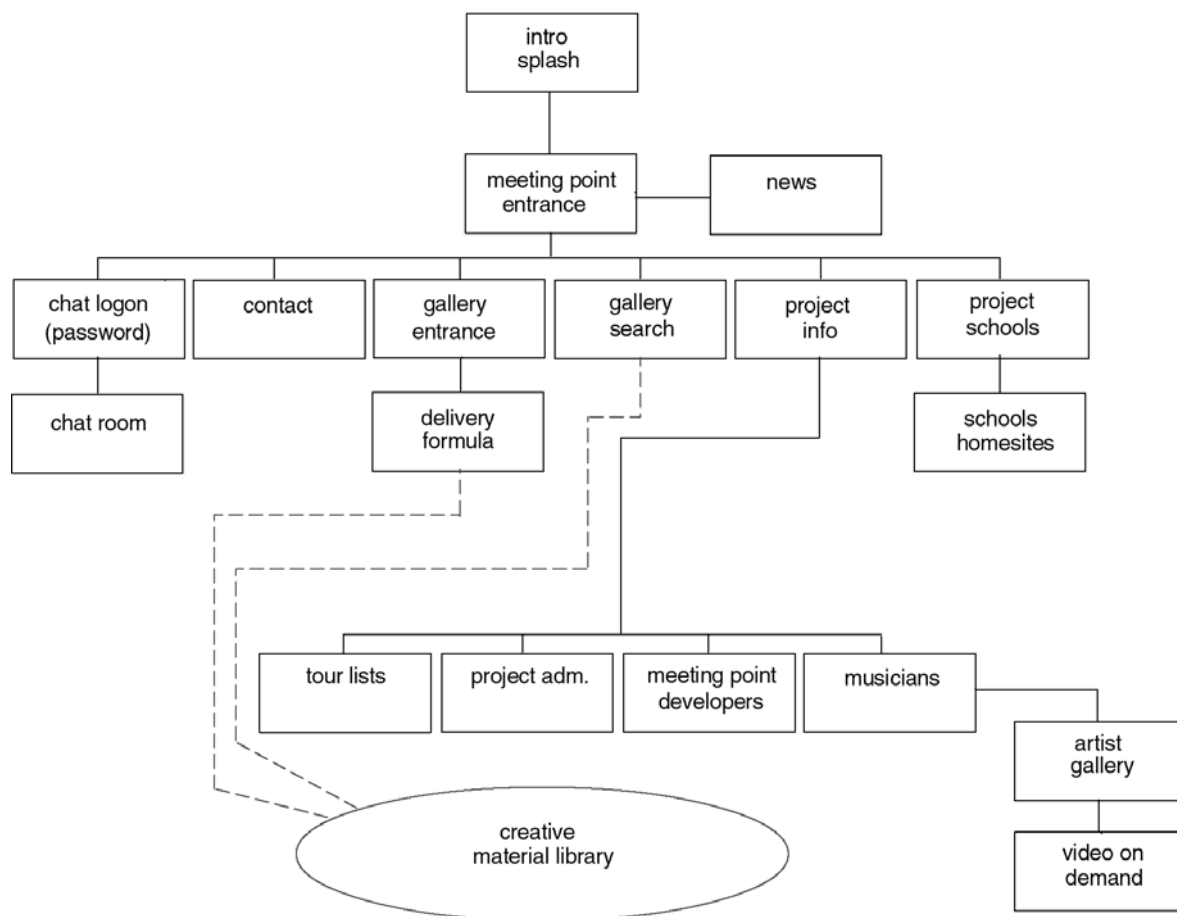


Fig. 2. The meetingpoint site structure

camera. 13 of the 25 connected schools had possibilities for the students to access the Internet every day. At the other 12 schools, students had access weekly or 2 times pr. month. 11 of the connected schools used Internet for project work, 12 used it for data education and 9 schools integrated Internet in different educational programs. Based on these results and on the technical information about the computers, the meetingpoint site development started.

2.3 "The Spindellev@" project MEETINGPOINT

The structure of the meetingpoint site [5] was carefully planned for optimum functionality. The entrance "splash intro" was designed to focus the users' attention to the concept of creation and design. News and menus were hosted at the main site with links to the chat room, the gallery delivery entrance, search engine for the gallery, project information and the schools' own homesites at the meetingpoint site. For many schools this was their first homesites on the WWW.

The menus were constructed using Macromedia Flash. A global menu continuously gave the users full access to all the main parts of the site while they maneuvered in the site structure. Pages generated by CGI-scripts, such as fault messages, login site and search results had no global menu. The homesites for each school were developed without global menu to give the possibility of greater individual design. Icons were used in the menu with added text with "mouse roll over", to focus more attention to the text or picture message on the site. Colors of the text links are turned to blue after being visited to say, "Been there done that!" [6]. Templates were developed for easy updating of the meetingpoint information with correct individual font style and positioning on the sites. An extension for Macromedia Dreamweaver [7] was used for implementing video on the site. Status playback and audio volume indicators could be placed independently from the movie frame and the metafiles ".rpm" and ".smi" were generated for videostreaming on two levels of connection speeds, 56 Kbps and 28.8 Kbps. A searchengine was developed for the virtual gallery with password protection and several independent search possibilities. A brochure was handed out to the audience beforehand with information about resolution and formats for the files prepared for the gallery, user information and some general information about Internet. A CD consisting of Internet browsers, plugins and other freeware programs was sent together with the brochure.

The specifications for the meetingpoint site were set to:

- Browser version 4.x, preferably Netscape Communicator 4.5.
- Shockwave Flash plug-in 7.x.
- Screen resolution 800x600, minimum 640x480.
- Real Player 5.0.
- Minimum access speed 28.8 Kbps.

2.3 The "invitation" performance

To give the audience inspiration and information to create and deliver their own originals to the gallery, a performance were created for the first visit to the schools. The audience experienced the limitations and possibilities of communication and telepresence production by sitting in an

experimental installation developed at KTH. The audience was split into 4 groups surrounding a big screen with light projections from both sides. The audience could see the same picture on both sides of the screen. On the one side, presented as the physical space, an artist performed in the light from an RGB projector pointed toward the screen. The artist also interacted with a camera put on top of the projector, framing the projected picture. On the other side, presented as the virtual space, a computer artist acted in the projection space between the light source and the screen. The adjustable light sources, computer sources and digital video effects from the camera were mixed and fed to the RGB projector. The shadow of the computer artist could be reflected on the screen. A quadrophonic speaker system surrounded the installation and sound from both real-time microphones and multiple MP3 players were presented as a powerful part of the audience's experience. Video feedback was an important part of the visual effects used. Screens from the meetingpoint on the Internet were projected as an information part in the performance. Digital pictures of the audience were taken during the performance for publishing on the schools' homesites.

The concert spaces were filled with ionized oil/water pearls at micro size for reflecting light. This "cracker" technology gave the light the effect of being physically present. Light that was projected from both sides of the screens appeared as square tubes with artists interacting with each other through the screen. The audience was sitting close to the projection space on each side of the screen. A shadow from the audience, like an arm or a leg that moved into the projection space gave a powerful opportunity for the performer to interact with the audience during the performance. The projection rooms and the installation itself often became a playground for the audience after the performance. By playing with the tools themselves, the audience improvised new performances by themselves.

2.4 The "concert" performance

The second visit to the schools consisted of the main concert created from the material on the gallery. Four professional musicians performing vocal, keyboard, drums and base were employed for the project. They all had great experience from improvisational music and composing. They also had access to the Internet and the "Spindellev@" meetingpoint site. The meetingpoint chat room was used for real-time contact between musicians, project members and the students, as the future audience. The students delivered material to the gallery as part of several different course programs. More than 200 pieces of text, music, midi and picture files were created and delivered.

The musicians selected based on their own artistic judgment pieces from the creative material for composing a basic concert. The concert had sequences of focus areas like friendship, love, nature, war and just crazy. The basic concert concept was enhanced with more local material from the gallery depending on which community and school that was visited. Some of the material used was just some few days old, delivered to the Internet and downloaded while touring. The drum player implemented audio samples based on short interviews with the audience close before the concert. This way of creatively interacting with the audience was part of the main concept of the concert project. Each concert became unique with many "creators"

in the audience listening to their own sound, text or melodies.

The music of the basic concert was recorded and created a basic platform for the visualization artwork. A video artist selected pictures from the gallery and prepared them for visualization at the concert, mixed with other audio/visual effects. The video artist projected visual material from the computer mixed with images from a remote controlled camera placed in the front on to a screen behind the musicians. This solution gave the video artist the possibility to select pictures and video from the audience and musicians during the concert and mix them onto the screen. The camera frames sequences were either stored for later use or mixed onto the screen in real time video. This feedback from the audience was also part of the interaction concept between audience and performers. Artificial light was mixed together with projections for more intensive expression.

All the audio sources were connected through a digital audio mixer for analogue output to the speaker system and digital recording for multitrack hard disk or digital 2-track stereo. The mobile professional recording equipment and the skills of the keyboard player made it possible to record the concerts at good quality. Some of the concerts were digital recorded and stored on tape or disk. These digital audio files could easily be compressed using MP3 audio quality for digital distribution shortly after the concert.

3. RESULTS AND EXPERIENCES

The second interview study was carried out 3 months after the last concert in order to investigate the learning process of the project. 980 students at 8 schools answered, representing all types of schools involved in the project.

3.1 The project used in education programs

Schools connected to the Internet answered that the project had triggered a more extensive interest in exploring the Internet. The meetingpoint functionality worked well and it was easy to deliver material to the gallery although sometimes plugins were missing when students entered the project site from their home. The Spindellev@ project was used in several course programs such as Norwegian, English, music, lyrics writing, artwork and handcraft, with good results. No big changes concerning access to Internet at the schools were measured during the project period of one year. The majority found that it was easy to understand the structure of the meetingpoint site on the Internet but wanted a "dynamic" site with more frequently updating of news.

3.2 The emotional experience of the audience

80% of the schools found the first "invitation" performance exciting and inspiring. 20% did not understand the meaning with it and thought it was noisy. The schools experienced the main concert positively as they felt ownership of the concert by strongly experiencing their own creative material. All the schools pointed out the positive feeling of knowing that other students like themselves had created material for the concert. The focus area of the text, music and audio-visual effects appealed well to the target group.

Words like exciting, mysterious, funny, special, good vocal were used to describe the experience. 10% thought the volume was too high and claimed they did not understand the concert. All the schools pointed out the great importance for students to discover their own material in an audio-visual performance such as the concert. Especially one of the schools experienced much of their material was frequently used in the concert and replied that "they talked a lot about it afterwards". The information from the project group was good and the schools felt that the project was "new and exciting". 90% of the schools wanted to join other similar projects, but pointed out the importance to follow the school year from summer to summer.

4. DISCUSSION

The project "Spindellev@" was a complex mixture of technology, communication and people being present both virtually and physically. Multiple media elements were combined with human musical expression to give the audience a stronger emotional experience. The Internet linked the project together on several communication levels. The research project reflects some of the complexity of being a human being. Teachers experienced a new dimension of using computers as a communication channel for creative work. Multiple media elements were used to express the young students' thoughts about life from their own point of view. The publishing of their material through the Internet gave professional composers and artists the possibility to achieve unique creation. The gallery was in this project connected to schools and students in a district. In the future, the same model could create new galleries for other districts, and other target groups. These galleries could be interconnected for public insight from the global network and give inspiration for more artwork worldwide. The feeling of being present on the meetingpoint site with homesites, pictures of the schools and created material together with other schools in the district made the students feel important and visible. The field study shows a great difference between schools and their social and technical environment. Some schools had only one computer connected to Internet. Still they belonged to the schools that sent the largest volumes of creative material to the meetingpoint site, and later, the concerts performed there became a big success. The project process, from giving information, collecting creative media, selecting media, composing, improvising and making the students artwork visible in a concert were driving forces for pedagogical work at the schools. The meetingpoint site had good functionality for the users. Some of the chat users needed more experience in order to use the tool efficiently.

The communication model for the project group implemented various tools for working remotely. This was necessary as each communication tool has its own qualities depending on the goal of the communication. The digital networked production system in this project worked well because of the characteristic of the digital media products. The physical meetings were important in order for the participants to know each other better before working remotely.

5. FUTURE WORK

The "Spindellev@" project generated more questions than answers. Still the model has interesting functions that must be further explored for pedagogical and commercial use. The following areas still need to be explored:

- Distributed performance spaces with interactive projection-rooms and audiences.
- Online publishing of concerts based on audience's creative material.
- Dynamic libraries of creative "free material" on the web.
- The use of computer-assisted real-time expression tools in performances.
- Interconnection of galleries on the Internet for creating worldwide libraries for inspiration and creation.
- "The language" of experimental performance installations.
- New concert and performance concepts.
- Questions of copyright.

6. CONCLUSION

The "Spindellev@" project showed that computer communication can be used as a creative channel where many people can create new musical experiences together. The techniques could easily be adapted to other types of collaborative creation.

The common experience can be used as a pedagogical force in the learning process at schools or for commercial production in the entertainment business. The "interactive" artist plays a new role as he/she selects and uses material provided by the audience as a basis for his/her own creative process.

When the schools have permanent, higher speed access to the Internet, more powerful tools can be used to produce telepresence and other types of computer communication.

The project group experienced the use of the net for producing digital media very positively. The use of interconnected computers makes project work at a distance easier, although the available tools are still proprietary. Tools for computer communication need to be standardized.

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Biography [8]

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