Media space - Creating a 'sense of community'

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Abstract— With consideration to a 'sense of community', where media spaces were used for cross site work, this paper is going to compare different types of media spaces like the RAVE at Rank Xerox EuroPARC, Kasmer at Xerox PARC and CAVECAT with one another. In this paper I am going to select the similarities and differences between the media spaces and discuss how they enhance a 'sense of community'. It will show how far awareness, connectedness and the interactions within it are supported by the media spaces above, because these properties are important to create a 'sense of community' in a shared space.

Index Terms—Awareness, community, shared presence, connectedness, media spaces

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1 INTRODUCTION AND MOTIVATIONS

Previous papers have been concerned with different technologies and general goals of media spaces [5, 14, 16, 19]. Their roots go way back in the 1980s where the foundation was set by the Xerox Palo Alto Research Center. The workgroup, connected to the laboratory, was in Portland, Oregon and thus it allows to maintain a 'cross-site work including the necessary social connection'[2, 14]. Media space nodes were created through 'cameras, microphones, monitors and speakers' [7].

Direct audio and video connections were used to support collaborations like formal as well as informal communication of remote users of a media space [5]. Both forms of communications support a 'seamless integration of work and personal space' and thus it allows both sites to be connected [2, 16]. Here especially the keyword 'real-time' plays an important role, because this fosters a remote collaboration, even being distributed spatially and temporary. Concerning the video connection, which is comparable to the 'awareness activity' [5, 14, 2], this one supports the informal communication like 'knowing when colleagues are in or busy'. This makes users aware of knowing 'what is going on around'. But media spaces also induce privacy an surveillance concerns [5, 18]. For this purpose it is important to keep a balance of information awareness between the two sites [16].

In this paper, I am going to discuss how well media spaces were implemented, with consideration to the cross-site work, to improve 'awareness (and connectedness) among people who are geographically dispersed but want to stay better in touch' [16], thus creating a 'sense of community' [5]. Media spaces were explored to understand how people use and collaborate with the systems, and how comparable it is to the everyday medium. It is also used to explore the balance between 'privacy and awareness' as well as 'awareness and disturbance' [16]. The results of the studies were used for further design improvements [7]. Considering the goals of media spaces which have been extracted from over the past decades of experiences, the focus of this paper lies on media spaces and their desire on creating a 'sense of community'.

2 CONNECTING PEOPLE THROUGH MEDIA SPACES

Nowadays, the research of media spaces are based on supporting the symmetries in 'content and media' [16] between the distant nodes [14]. To understand collaborations in media spaces, we have to understand 'how we can communicate and interact' in the medium. In the Portholes' project a shared awareness has provided a 'sense of community'[5], because the users' awareness constantly tries to update the social and physical interactions in the environments [16], which is also the basic idea of media spaces [5]. This means to enable not only one activity in media spaces [2], but still allow users to

concentrate on their main activities[15], while other sources concurrently try to get into the background awareness [10]. So, properties like awareness and connectedness play an important role in the collaborative environments and in establishing a shared space [3, 12, 7].

2.1 Shared and peripheral awareness in media spaces

Rowan and Mynatt have defined the awareness as 'the state of knowing about the environment in which you exist; about your surroundings, and the presence and activities of others' [4]. This definition leads to the use of a system for background information, which could also be understood as 'passive awareness' [5] or 'peripheral awareness', because users always want to maintain awareness of events on the local as well on the remote site [7]. This means the support of 'focussed awareness', which is understood as the use for intended tasks with participants on the remote site [6]. In order to foster a 'community' it is favourable to support public discussions instead of private ones, which arise simultaneously in meetings [14].

Constantly capturing visual and auditory information contribute a remote collaboration [7], which supports besides a 'community' also the use of the system as a 'lightweight information tool'. This allows users to check if someone is available and can be interrupted or not. The media space connection is also called 'Glance'. But it also offers connections like sending e-mails and recording 'audio snippets' [5]. So media spaces should try to create an 'unobtrusive awareness', but still with an update of the actitivies in the media spaces [6].

Media spaces are an approximation to a face-to-face communication [14], because cameras make visual information in the space available [7]and thus should be similar to the natural visual system, which 'consists of moveable eyes in a moveable head on a moveable body', because this would lead to natural discussions [5] and also meetings of larger groups to take place in common areas or in conference rooms [2]. Media spaces should represent 'physical closeness in the same office' to make participants in the space aware of their colleagues around [14], which is defined as the visual symmetry and is supported by 'video tunnels' in media spaces [19].

2.2 Connectedness and interactions in media spaces

IJsselsteijn (2003) said that humans 'have a fundamental need to communicate, to form, maintain and enhance social relationships' and that connectedness is a' feeling of being in touch with other'[8]. This is also part in the definition of awareness above, where people 'sense of what happens on the other site'[2]. Media spaces were used as an approximation of the everyday medium, which supports interactions [16, 7] like 'chance encounters' and 'locating colleagues'[2], because it provides to be aware of 'activities of colleagues in the area through ambient sound and (...) presence of passers-by' [9, 10].

The 'illusion of a (...) room beyond the screen' enables a sense of augmented participation [12], this supports a substitution between geographically shared groups[2]. It is also similar to the concept of togetherness, where groups of people collaborate with each other [11] through drawing [13] or writing [17] via additional devices in media spaces. So its focus is lying on supporting and maintaining an ongoing

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communication between the nodes, which includes the shared activites [12]. Not only does this mean to support work activity, but also to enhance a single community, which can also spend 'Common lunch', 'Christmas Parties' [2] or other physical activities together. This helps to become acquainted with each other and to maintain their relationships through distance and contributes to understand the shared experiences [1].

3 DESIGN IMPLEMENTATIONS TO SUPPORT INTERACTIONS IN MEDIA SPACES

In the section above the main aspects of media spaces were bunched together. In this section I want to discuss how well awareness and interactions in media spaces were supported by the media spaces at Rank Xerox EuroPARC (RAVE), XeroxPARC (Kasmer), CAVECAT and the Me-dia Space. There are several problems which are caused through the design implementations in media spaces, one of it is that the awareness in the scences is limited [7]. Based on the technology or how media is conveyed to others [19]. Another problem is the limitation created by cameras and monitors, because they cause visible constraints in interactions [14], which effect the remote collaborations [7]. On this purpose we need technologies which support coordinating these relationships [1].

3.1 Progress awareness and interactions through audio and camera

In both, the media space at Rank Xerox EuroPARC and XeroxPARC and the CAVECAT, visual informations, transmitted by cameras were constrained by video technologies [7, 14], because of the camera angles and the distance between the user to the camera. These issues often bias 'impressions of people in distant places' [1] and make things on monitor unnoticed [7]. To achieve an approximately face-to-face communication, moveable cameras were developed to create an illusion of 'moveable eyes', but this was not implemented in both media spaces RAVE and Kasmer. Instead of it, cameras were often mounted with an wide angle view. But movement could overcome this issue, therefore both media spaces use multiple cameras to transfer video images from different angles, this provides higher resolution of the image. Another solution, which was used in the RAVE, were 'mounted cameras on remotely controllable robots arms or vehicles', but this was impractical. A head tracking device was also a possibility to control remote movement, because this allowed natural exploration of the environment. Gesturing over the media space were often unnoticed, because they were often overlooked caused by the constraint monitor size. By using larger monitors, gestures over monitor become more visible [7]. In CAVECAT the monitor displays a 2 x 2 grid of the images on the remote site, this also effects the resolution of the monitor[14]. It may cause a loss of eye contact in the systems at both laboratiories and the CAVECAT. These create 'video-tunnels' with half-silvered mirrors, which allow to view a scene as if a camera is mounted in front of the monitor. This also improves the awareness, because it facilitates the 'turn-taking' and indicates interest in conversations and interactions [7, 14].

Media spaces also show up problems in sound, which were transmitted by constraint channels, thus it is hard to capture attention of the remote site, therefore stereo 'audio equipement were hang freely and were mounted on damped material' [7]. The awareness in the Me-dia space is only controllable by the teleworker, he can open and close the door of his office and thus can decide when he wants to collaborate with his office. The Me-dia space has only a limited view of what is visible through the doorway. A community could only be formed by using the Me-dia Space, because no one else does own a further node in the Me-dia Space [19]. The media spaces' interface of RAVE and Kasmer do have different kinds of connections to provide awareness: a 'background' button allows people the presence of one public area, 'sweep' [6] and 'glance' button are short connections, to check if someone is available or not [5] and to 'sense what is going on on the callee's site' [16]. For a more extensive interaction, there are the buttons 'vphone' and 'office share' [6], these could be used for interactions like group meetings or shared activities [2] like the shared drawing (CAVECAT) or writing [13, 14]. All these buttons contribute to maintain the awareness and to focus on their interactions with participants on the remote site [6], which also creates a sense of presence [3]. And thus it establishes trust and confidence [12] and supports the sense of group [3].The impact of meetings through CAVECAT is the missing presence, where every participant should be aware of his colleagues. Thereof two kinds of communication emerge in it: public conversations, where users communicate with the remote site and meanwhile private conversations occur between colleagues in the same room [14].

Thus, to support a 'sense of group', even with a long distance, it is important 'to establish a sense of shared presence'[3]. This means to use technologies to support properties like eye contact and other social interactions, which were displayed on the monitor and are limited by the technologies of media spaces [7, 14].

3.2 Offering privacy

Visual and auditory information between the nodes support remote collaborations, but point to an asymmetrical awareness in visibility and auditory [7], because people in the systems can have an 'one-way glance', which means observing the remote site without his or her knowledge [6]. The media space RAVE solves the privacy concerns by enforcing symmetry. As a result one can see and hear the same what the other ones do in the space do. Another solution was to determine who is allowed to get control over the camera on the remote site [7]. Media spaces tried to find a balance between 'privacy and awareness' and 'awareness and disturbance', thus abstract representations were developed to remove unimportant parts but still 'convey a sense of remote presence'. Parts of the original were removed and transmitted, thus it could lead to an effortful interpretation by the 'reader'. By the use of abstract representations, the contrast of the image is visibly improved and thus finds its way into the 'focussed attention', but with consideration to the privacy concerns[16]. But media space can also offer privacy for example the 'background' button of the media space RAVE allows to use a public area as a background of an office monitor, this automatically awares people that he or she is observed [2]. But in difference to the RAVE, the CAVECAT does not notificate, that someone is present in your office [14]. This leads to the developement of non-speech audio cues by Smith and Hudson to provide feedback [18, 14]. The idea of it is to extract and transmit just the significant parts of the audio to the remote sites. This does 'offer little privacy', but still contains privacy concerns because the speaker does not know who is listening to him. Also it achieves less attention from listeners so that it is not an interruptiv activity [18]. In the Me-dia Space privacy is only granted for the video of the home office, because the teleworker is able to blur and unblur his image, if he does not want to be disturbed or if he is available. The video image of the office is always sent unblurred and thus it does not offer privacy for people who only walk in the common area or are just randomly near the office [19].

4 CONCLUSION

In this paper I have discussed four types of media spaces and their effects on the awareness, connectedness and interactions within it, to build a 'sense of community'. Based on the work about media spaces, the main point of them is that participants in these environments constantly keep their background information updated. This creates a feeling of staying in touch. A media space is an approximation of the everyday medium, thus it needs properties like move, gesture and offering privacy. These properties toghether provide the awareness and interaction of a user, hence to create a shared presence in a shared space. Because movements in media spaces can avoid camera limitations and thus enhance gestures to get attention on the remote site. Also interactions in a shared space were support, because it enables group discussions and shared activities like drawing and writing. The only difference is that the media space is an asymmetrical medium and thus develops abstract representations and non-speech audio cues to support privacy in a communication. Future work can consider the improvement of privacy, structure and quantity of video images to foster conversations.

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