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Citation: Sillence, Elizabeth (2005) Beyond the Web: integrated digital communities. International Journal of Web Based Communities, 1 (3). pp. 360-371. ISSN 1477-8394

Published by: Inderscience

URL: <http://dx.doi.org/10.1504/IJWBC.2005.006933>  
<<http://dx.doi.org/10.1504/IJWBC.2005.006933>>

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# **Beyond the Web – Integrated Digital Communities**

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Dr Elizabeth Sillence is a researcher at the University of Northumbria. She has degrees in Psychology and Ergonomics and gained her PhD from Birmingham University in Human-Computer-Interaction. She is currently researching the use of the Internet in health advice and exploring integration of information resources. Her main research interests are digital communities, online advice, trust and the social aspects of mobile phone use.

This paper details two case studies exploring integration within digital communities. Three types of integration are introduced – information, technological and online-offline integration. These concepts are explored through two online fan communities and through a mobile – web based system. All types of integration were present and are vital to members' communication and interaction needs.

## **KEYWORDS**

Web-based communities, digital technology, integration, text messaging

## **1. INTRODUCTION**

In recent times the Internet has provided the most common focus for examining the relationship between technology and community. Concurrent fears and delights about increasing access to the Internet illustrate just how little is understood about the role of technology within human interactions. The debate amongst both academics and the general public regarding the social impact of the Internet has raged since the early 1990s. On the one hand (Putnam, 1995; Weinreich, 1997) it has been argued that increasing immersion in online activities is destroying real social interaction and community. On the other hand, enthusiasts maintain that the Internet empowers the disadvantaged and extends community involvement (Mele, 1999; Hermida, 2002).

These opposing viewpoints illustrate two main features of the study of digital communities to date. Firstly, the persistent focus on the Internet at the expense of all other technologies. Secondly, the seemingly unbridgeable divide between online and offline worlds. Together, these two features have led to the polarisation of opinion regarding the effect of technology upon community and have restricted the study of other technologies within digital communities. The focus on the Internet has, in many cases, limited the study of digital communities to that of online communities and within this to a single technology, for example, web message boards. Online communities are often portrayed as groups of people existing entirely within the confines of a single technological domain. These communities are viewed as groups, which have developed within the online environment and use this medium as their only form of group interaction.

This paper proposes a far more integrated notion of digital communities. It is suggested that digital communities are communities whose members use a variety of technologies in support of their communication and interaction needs. Technologies such as the web, email and mobile phones are integrated into the community often in conjunction with face-to-face interactions. New technologies and services for digital communities need to allow multiple, integrated technology use and should be flexible and adaptable to the social needs of the community members.

Integration is an important feature of members' social interactions. Current designs, for example of websites to support digital communities, might fail to adequately address the roles and uses of other technologies in the development, management and growth of the community. Technology is not just the medium through which communities exist, as is often thought to be the case with online communities, but it can play a supporting role within all kinds of communities, in particular by supporting and extending face-to-face interactions.

## **2. DIGITAL COMMUNITIES**

Within the social sciences, there is little agreement upon the definition of the term 'community'. Changes in its usage over the last few centuries reflect differences in terms of who is using it, when they are doing so and what their purpose is.

Hamman (1999) presents a definition of community that allows both physical and digital communities to be characterised. A community refers to 1) a group of people who, 2) share social interaction and 3) some common ties between themselves and the other members of the group and who, 4) share an area for at least some of the time.

Numerous detailed studies have shown that groups of people online can form and sustain social groupings which meet this definition of community. In online communities, members share an online area for at least some of the time (Rheingold, 1993; Baym, 1998; Preece & Ghozati, 1998b). Indeed, one aspect of developing digital communities is to provide members with a shared online area in which to congregate and share ideas, opinions etc.

Whilst provision of an online area for communication is an important component of digital communities, many studies of these communities have highlighted the importance that community members place on physical meetings (Ito et al, 1999). Indeed, communities and relationships that began online can successfully encompass offline communications as well (Parks & Floyd, 1996) and other technology, such as the telephone, become important in maintaining relationships (Wellman, 1996). Increasingly, researchers and designers are recognising the demand for the provision of virtual support and community for locally based groups (Connery & Hassan, 2004). Such studies indicate a blurring of the boundaries between off- and on-line communities, as well as emphasising the integration of media within digital communities.

It is common to find that one medium is used to arrange subsequent interactions via another medium. One example where this occurs is with the use of Instant Messaging (IM). IM is often studied within work settings (Nardi et al, 2000; Issacs et al, 2002) but in a study of IM in teen life, Grinter & Palen (2002) showed that IM sessions between friends are often arranged via email or face-to-face at school. IM provides a way of conversing with friends outside of the times and places that socialising is

traditionally permitted (Grinter & Palen, 2002). With the promise of cheaper broadband Internet access in the UK, applications such as IM are likely to become more attractive to the home user. In Europe, mobile phones and SMS are used in a similar way to IM in that they are used to create additional opportunities to socialise (Longmate & Baber, 2002a).

### **3. INTEGRATION WITHIN DIGITAL COMMUNITIES**

Increasingly a wide array of technologies is being incorporated into community settings. Technology is contributing to community development and is also supporting existing communities both in distance and co-located settings (Wellman, 1996; Hampton, 2002a;). In Hampton's (2002a) wired neighbourhood study, online communication does not reduce face-to-face contact but actually increases communication. In particular Hampton noted that the use of Information and Communication Technologies (ICTs) by the wired residents actually encouraged the formation of local community. Not only can people create and sustain strong ties through electronic media (e.g. Baym, 1998; Patterson 1996; Rheingold, 1993) but they can use electronic media to maintain offline relations (Wellman, 1996) and can successfully integrate relations that began online to include offline communications as well (Parks & Floyd, 1996). Members of communities are using a greater number of technologies to keep in touch. Social network theorists have found that the stronger the relationship between communicating partners the more media they use to maintain their relationships (Haythornthwaite, 2001). Closer relations, for example, might communicate face-to-face, via email and the telephone. Furthermore, a number of researchers point to the practical and psychological benefits of integrating offline and online interactions (Etzioni & Etzioni, 1999; Suler, 2000).

Integration may take several different forms within communities. The three main forms of integration are outlined below:

**Technology or communication integration:** is perhaps the most apparent form of integration within communities. Members of communities use multiple methods of communicating information both for task based and social purposes.

**Information integration:** involves combining different sources of information for the purposes of aiding community development or to emphasize an individual member's point of view.

**Online-offline integration:** is an emerging feature of communities. As technology becomes more accessible and a feature of every day lives so communities are spanning the online-offline divide and relationships exist within both domains.

The main aim of this paper is to examine the importance and extent of these three types of integration within communities. Two case studies are presented. The first explores naturally occurring integration within two online communities. The second examines integration within a system designed to encourage group communication and competition. The system consists of an integrated web and SMS element. The case studies allow a number of questions to be explored including whether or not all three types of integration exist in different types of digital community and which is the more prominent type. Its also allows some recommendations to be made regarding the different types of integration and communities?

#### **4. CASE STUDY 1: HARRY POTTER ONLINE COMMUNITIES**

The first case study is a naturalistic study examining integration within online communities. In order to examine the extent and importance of integration two communities with the same purported purpose were examined. The two online communities are both based around a common interest in the fictional character Harry Potter. Harry Potter is the central character in a series of books written by the British author J. K. Rowling. The books follow Harry's exploits at Hogwarts School of Witchcraft and Wizardry, where he is a pupil. Particular interest in the UK and the US has led to the establishment of several Harry Potter online communities. This study examines two such communities. The first (Site A) is based around an email list. The second (Site B) is based around a message board.

The two online communities exhibit many similar, generic characteristics. They are both examples of asynchronous distributed interaction. Email lists are a powerful broadcast medium for information and announcements but can also support small, intimate groups. Message boards are based on the metaphor of a physical notice board in which people leave messages for others to read. Email lists and message boards both provide a record of the interaction, which can be reviewed. Messages can also be edited and revised. Message boards contain explicit threading which makes apparent the relationship, or sequence among messages. The two communities also differed in terms of their usability and sociability factors (Preece, 2000). Usability focuses upon the human-computer interaction. In terms of online communities, usability impacts upon members' ability to communicate with one another, locate information and navigate through the system. Sociability refers to the social interaction between group members. Why do members want to communicate, for example, should discussion be moderated and how will members identify themselves within the community?

In terms of usability, Site A allowed messages to be posted to individuals as well as to the whole. In Site B, a reply template meant that replies or new messages could only be posted to the whole group. In fact individual email addresses were not permitted on Site B. In terms of sociability, Site B was moderated whereas Site A was not.

#### **4.1 Data collection**

**Participant observation and message collection:** The author acted as a participant observer throughout the three-months of the study. During this time, a period of message collection took place. All posts to Site A over a 4-week period were collected (316 messages in total). During the same time period there were over 6,000 posts to Site B. It was not possible to analyse this number of posts. Instead the focus of attention was limited to two of the message boards. Samples were taken from the beginning and the end of the study period. In total 415 posts were collected. From observations the collected posts appeared to be representative of the interactions present in the communities.

**Posting figures and questionnaires:** In addition to the collected posts, data on posting figures was also gathered. An electronically distributed questionnaire was used to gather demographic data and personal statements about the nature of the communities. Some of the questionnaires were followed up with email-based interviews. The results for the integration section presented below draws upon the questionnaire data. The questionnaire was posted to both groups after the data collection period. 32 responses were received. 15/18 of the active weekly posters to

the email list group responded to the questionnaire. 17 frequent and more occasional posters from the message boards responded to the questionnaire.

## **4.2 Results**

**Information integration:** Integration between different types of information source was examined. Table 1 shows the number of messages containing references to other sources of information. 15% of all the messages in Site A contained a reference to another source of information, for example, a reference to another web page, an email or a newspaper article. The moderation in Site B, did mean that the messages contained far fewer references to other sources of information, particularly less references to other websites. The results show that members of both Sites A and B integrate a number of information sources into their community discussions. Community members would often make reference to gathering information from books, films, television and radio broadcasts.

<Table 1 about here>

**Technological or communication channel integration:** Integration between different communication channels or technologies was also examined. The messages in Site A contained far more personal information i.e. age, name, location than in the moderated Site B. Site A messages were less likely to contain individual contact detail information. The questionnaire data showed that approximately half (7/15) of the Site A respondents use additional media to communicate with the other members. This figure rose to over three-quarters (14/17) of the Site B respondents. Personal email addresses provided the most common additional way of communicating. Other

communication media included instant messaging and Internet Relay Chat (IRC). A greater proportion of the messages on Site B contained contact details. Members on Site B also used more media to contact each other. Members of both sites have found additional ways of communicating with each other. These include, private email, instant messaging, IRC and face-to-face. The communications media in site B are also well integrated. People on Site B may use face-to-face meetings to arrange times to meet on the boards. After they have met they may choose to continue their discussions elsewhere, for example, in a chat room.

**Online-offline integration:** Integration between online and offline communities was examined. Members' involvement in the Harry Potter communities has extended into the rest of their lives. 7/15 and 16/17 of Site A and B respondents respectively discussed the group with people outside of the group such as friends, relations and workmates. There was also evidence of their online community interactions being integrated into their offline interactions and vice versa. Members of both sites have integrated their online community involvement into the rest of their lives (see figure 1). Members discuss issues that arise online with people outside of the communities. This includes passing on the latest theories and discussing problems with the boards. Members also encourage friends and family to join the online discussions.

<Figure 1 about here>

## **5. CASE STUDY 2: SMS-WEB FOOTBALL STUDY**

The aim of the second study was to see if a community, with a specific focus on the 2002 Soccer World Cup, could be developed and supported for the duration of the tournament using a combination of SMS and web based interaction (for more technical detail of the system see Sillence & Baber, 2004). A system combining SMS with a website was developed in order to explore community development and integration. These technologies were selected simply on the basis of their prevalence as communication media for young people. The combination of the technologies is examined through a study that explored the development of a digital community. The specific questions to be addressed are, what part do the different technologies, both separately and in combination, play in shaping the group's interactions and the development of the members' sense of community?

Combining SMS with a website allows an archive of SMS messages to be stored and presented to the group members. The group can see a transcript of their collective messages, see when they were sent and by whom. They can follow group discussions and direct messages to the whole group as well as replying to individual messages using the threading facility. The website also provides a group wide accessible area for displaying additional information and resources regarding the topic of interest. Additional information on the website gives members another reason to view the website and engage with the group. SMS itself allows messages to be sent anytime from any location. It can be used as a broadcast medium for delivering ideas and information to the rest of the group. A SMS-web based system could also deliver SMS messages from the system to the group and if required could relay on individual members' messages to the rest of the group. Sending out SMS messages is useful when a quick response is required (Ling & Yttri, 1999; Longmate & Baber, 2002a).

The study ran over the course of the World Cup 2002 (May 31<sup>st</sup> to June 30<sup>th</sup> 2002). 16 people took part. Participants had to take part in a SMS World Cup soccer group. The purpose of the group was twofold. The first aim was to engage in discussion about the World Cup. The second aim was to take part in two World Cup competitions.

Participants were invited to send SMS messages to a website and to follow the soccer games in order to take part in the competitions which spanned the four weeks of the tournament. Each participant was assigned two teams to support. The first team was taken from the higher ranks of the competition and the second from the lower ranks.

Each participant was identified on the website by the ISO standard codes representing their teams e.g. BR/ZA (Brazil and South Africa). Each player was also assigned two player numbers. Each combination of player numbers was used twice. Therefore two participants held, for example, the numbers 9 and 17. Participants could make a claim to the wins table every time either of their teams won, lost or drew. Participants gained three points for a win and one point for a draw. Participants could also block the opposing team from earning points by registering their own team's loss first.

Participants were encouraged to send at least two chat messages a week to the message board and as many claims to the league table competitions as they wished.

To differentiate competition messages from chat messages participants used a pre-determined format for competition messages.

## **5.1 Data collection**

Measures of community activity were taken in weekly blocks. All activity on the website was automatically logged. Website activity was recorded as the total number of hits to the website. A hit was recorded every time a member viewed a page on the

website. All the chat messages and claims to the two league tables were recorded. The content of the chat messages was analysed. Following the approach of Preece & Ghazati (1998b) each message was examined holistically and was classified in one category only in terms of the overall tone of the message. An online questionnaire was posted to the website three times during the study period.

## **5.2 Results**

In terms of activity the SMS football group was a great success. In total 317 messages were sent to the website. This included 119 chat messages, 84 claims to wins table and 114 claims to the goals table. In terms of the competitions 58/64 of the matches were claimed for and 40% of the 286 claimable goals were claimed. The log data and the content analysis were examined for instances of integration. Integration between sources of information and the system was noted. The main source of information for claims was watching the match live. Everyone that made a claim used this source of information. The logs show that 67% of the wins claims were made within 5 minutes of the match finishing. Members claimed for 40% of the goals whilst watching the matches. Integration between the two components, SMS and web, was also noted and is discussed in more detail below.

**Technological or communication channel integration:** The community used the different components of the system to support their activities. The two technical components of the system were well integrated and allowed different types of interaction. SMS messages sent without referring to the website were less interactive and tended to be slightly shorter. SMS, however, allowed messages to be spontaneous and context based. It did not hamper discussions and was seen as a natural medium

for discussion about the World Cup. SMS messages were responded to immediately and provided a perfect medium for alerting people to changes on the website.

**Information integration:** The website allowed a permanent transcript of the messages to be recorded and displayed. The website also contained extra features including the two competitions. In addition, members used the television, radio and other websites to support their discussions and claims. Information concerning the goal scorer was particularly difficult to locate post match. Members reported finding this information via Ceefax pages and obscure websites.

(44) 20:40 06/06 (5th post by es/uy)

Have found a good unofficial station with commentary from ALL matches: it's on LONG WAVE 252 (used to be Atlantic252 pirate station)

Face-to-face communication also played a role as did SMS messages and emails. Figure 2 shows the integrated components of the community. Members that knew each other combined technologies to enhance their chances of successful claims at the expense of others. One member rang another member's mobile phone from a landline. This ensured that the other member could not send in a winning SMS claim before they did.

<Figure 2 about here>

**Online offline integration:** The questionnaire results showed that members discussed the group with other members in face-to-face settings and via phone calls, SMS messages and emails. When interaction within a system is primarily technology mediated, as in the SMS football group, it is predictable that the same media will be used to extend the discussions beyond the system. The fact that members also communicated with each other face-to-face reinforces the idea of media integration within digital communities. Members also discussed the group with friends, family and work colleagues, again using a variety of media. As the competition progressed the participants began to mention their offline worlds in the online discussions:

(97) **13:18 15/06** (12th post by **br/za**)

I hope you're all enjoying the match, some of us are at work + can only guess the score from the cheers coming from the pub opposite... Not that i'm jealous!

(56) **12:27 08/06** (4th post by **fr/hr**)

SAW THE MATCH WHILE WORKING IN A LAB. WE WERE SURPRISINGLY GOOD.

## **6. DISCUSSION**

The two case studies reported here highlight the importance of integration within digital communities. All three types of integration were noted in all the communities studied. In case study 1 the members of the web-based communities would often make use of email, telephones or written correspondence to keep in touch, or would make reference to gathering information from books, films, television, radio broadcasts etc. In other words, these 'other' technologies are integrated into the activity of the 'web-based' community. Including references to other media and

information sources extends the range and interest of the community as well as providing a source of verification.

Integration is an important feature of online or digital communities and one which currently has been underestimated in terms of design. Some recent work has highlighted developments in the area of technological integration. Outi et al (2004), for example, describe Areenat.net a mobile application platform with local context for virtual communities. Design decisions about the way in which community members can interact and exchange information have been shown to affect the nature of the community itself (Preece, 2000). In case study 1 certain sociability policies had restricted the amount and type of integration possible within the communities. Trying to control or manage social interactions is a more difficult task than the sociability guidelines would suggest. The majority of people joined the groups because they wanted to make friends and chat with like-minded people. Moderation, for example, severely restricts the amount and type of social interaction that can occur and severely limited both information and technological integration. Restrictions in terms of design decisions regarding the supporting technology and the social interaction policies led community members to adapt the technology to meet their needs. Member adaptations included subverting the message board genre into one of chat in Site B. Chat is a synchronous communication medium yet the message board in Site B is asynchronous tool. It is perhaps not surprising then that members reported experiencing frustration when “the system didn’t keep up with our conversations”. Where adaptation was not possible members moved away from the community sites in search of other more suitable technologies to meet their social interaction needs.

The second case study described a community in which integration was both permitted and facilitated. A great deal of integration occurred within the community. Not only were the system components well integrated but there was evidence of information integration and online-offline integration as well. In the second case study the group integrated the two components, SMS and the website, very well leading to a community that contained both spontaneous messages that captured the moment as well as more reflective and in-depth discussion. The two components of the system were used in different but complimentary ways. The SMS medium proved to be a natural way of commenting on soccer matches and expressing opinions regarding players and results. The SMS component allowed alerts to be sent out to all the members ensuring that they continued to feel included and involved in the group. The website provided two main functions. It provided a communal space for the community. This space included the match fixtures and results and the competition scoreboards. The website also provided a threaded archive of all the groups' messages. In combination with SMS a communal memory of the group was built up. This allowed the group's activities to be played out in front of its members allowing them to become involved in its history. The members of the digital community that developed used the system in conjunction with other technologies. These included the radio, television and other websites as sources of information. This is perhaps not surprising given the activity of the community and its relation to real-world events. Members did, however, integrate other communication technologies into their community in order to carry out their activities and strengthen their sense of community

Different communities reflect different kinds of integration. All present to some extent. In fan based communities like HP information sharing is vital to plot speculation etc. In the SMS football community being about to integrate the two types of technology was vital to be able to interact both socially and competitively. As communities develop their members will start to cross online-offline boundaries and support for this type of integration is vital at this stage.

It is recognised that the focused topics reported here in these two case studies might not reflect *all* types of digital community, but we feel that it could capture many aspects of the ‘fan-based’ communities that spring up around books, films and sports. Furthermore, whilst it is noted that the communities studied here in this paper were based around ‘real world’ activities, studies of other, more virtual-based communities suggest that integration in terms of other communication media, if not other information sources, is common. Alt.good.morning (AGM) is a newsgroup without a prescribed topic and with no reference to real-world activities. Patterson (1996), in her study of the newsgroup, noted that AGM is not restricted to Usenet, members also communicate via email, real time chat, snail mail, telephone and increasingly frequent face-to-face meetings. The potential for anonymity and escapism within digital communities is far greater than in physical communities. However, it is difficult for even online communities to exist in isolation from other media or from the physical world in which their members live (see also Schiano & White, 1998). Notwithstanding the fact that some members may participate in digital communities in order to escape or to be someone else, systems that support digital communities still need to remain flexible to their members’ social interaction needs. This includes allowing the integration of multiple media for information and communication

purposes as and when they are required. Designers could facilitate different types of interaction within a website by allowing members to directly link to different media. Allowing members to move between message boards and chat rooms within a site, for example, may help them to remain loyal to that particular site. Including links on the website to other media sources also aids integration. Designers can include their own links as well as recommendations from the members themselves.

## **7. CONCLUSION**

It is no longer viable to assume that digital community refers to groups of people existing entirely within the confines of a single technological domain, in most cases the web. Nor is it viable to assume that such groups have developed solely within the online environment and use this medium as their only form of group interaction. Instead, members use various technologies in support of their communication and interaction needs. These technologies support their activities and sense of community. Technologies are integrated into the community often in conjunction with face-to-face interactions. Previous studies have failed to examine in detail the issue of media integration. The extent of media integration shown in this study and in previous work indicates that community designers must allow for all forms of integration, informational, technological and across the online-offline boundary if they want to retain their members.

## **REFERENCES**

- Baym, N. (1998). The Emergence of Online Community. In S. G. Jones (Ed.) *Cybersociety 2.0 Revisiting Computer Mediated Communication and Community*. Sage, Newbury Park, CA pp. 138-163.
- Connery, A. & Hassan, H. (2004). Sustaining a Locally-Based Virtual Community. IADIS 191-198.
- Etzioni, A. and Etzioni, O. (1999). Face-to-Face and Computer Mediated Communities: A Comparative Analysis. *The Information Society*, Vol. 15, No. 44. pp. 241-248.
- Grinter, R. E. & Palen, L. (2002). Instant messaging in teen life. In Proceedings of the ACM conference of Computer Supported Cooperative Work (CSCW'2002). November 16<sup>th</sup>-20<sup>th</sup> 2002. New Orleans, Louisiana, USA, pp 21-29.
- Hamman, R.B. (1999). "Computer Networks Linking Network Communities: A Study of the Effects of Computer Network Use Upon Pre-existing Communities", Available at <http://www.cybersoc.com>
- Hampton, K. N. (2002a). Place-based and IT Mediated "Community". *Planning Theory and Practice*, Vol. 3. No. 2. pp. 228-231
- Haythornthwaite, C. (2001). Tie Strength and the Impact of New Media. *Proceedings of the Hawaii International Conference on System Science*, January, Maui, Hawaii.
- Hermida, A. (2002). Web Gives Voice to Iranian Women. *BBC Online*. 17<sup>th</sup> June 2002. [http://news.bbc.co.uk/hi/english/sci/tech/newsid\\_2044000/2044802.stm](http://news.bbc.co.uk/hi/english/sci/tech/newsid_2044000/2044802.stm)
- Issacs, E., Walendowski, A. Whittaker, S., Schiano, D. J. & Kamm, C. (2002). The character, functions and styles of instant messaging in the workplace. In Proceedings of the ACM conference of Computer Supported

Ito, M., Adler, A., Linde, C., Mynatt, E. & O'Day, V. (1999). Final report: broadening access: Research for diverse network communities.

<http://www.seniornet.org/research/9911.shtml>

Ling, R. & Yttri, B. (1999). Nobody Sits at Home and Waits for the Telephone to Ring: Micro and Hyper-coordination Through the Use of the Mobile Telephone. Telenor report 30/1999

Longmate, E. and Baber, C. (2002a). A Comparison of Text Messaging and Email Support for Digital Communities: A Case Study. In X. Faulkner, J. Finlay, & F. Detienne (Eds) *People and Computers Volume XXVI. Proceedings of British HCI Group Annual Conference, London, Sept 2-6, Springer Verlag, pp 69-88.*

Mele, C. (1999). Cyberspace and Disadvantaged Communities: The Internet as a Tool for Collective Action. In M. A. Smith & P. Kollock (Eds.), *Communities in Cyberspace*. Routledge, London, pp 290-310.

Nardi, B. A., Whittaker, S. & Bradner, E. (2000). Interaction and outeraction: Instant messaging in action. In proceedings of the ACM computer supported cooperative work (CSCW'2000). December 2-6, 2000. Philadelphia, USA, pp79-88.

Outi, C., Kari, H. & Miia, K. (2004). "Areenat.net"- Virtual & Mobile Activity Forum For Finnish Youth in the City of Kouvola. IADIS 472-476.

Parks, M. R. and Floyd, K. (1996). Making Friends in Cyberspace. *Journal of Communication*, Vol. 46, No. 1. pp. 80-97.

Patterson, H. (1996). *Computer-Mediated Groups: A Study of a Culture in Usenet*. Unpublished PhD thesis, Department of Computer Science, Texas A & M University. [http://www.agm.net/holly/holly\\_dissert.html#ct](http://www.agm.net/holly/holly_dissert.html#ct)

Preece, J. & Ghozati, K. (1998b). Offering Support and Sharing Information: A Study of Empathy in a Bulletin Board Community. *Paper presented at the Computer Virtual Environments*, Manchester, England.

Preece, J. (2000). *Designing Online Communities: Designing Usability Supporting Sociability*. John Wiley & Sons, Chichester UK

Putnam, R. D. (1995). Bowling Alone: America's Declining Social Capital. *Journal of Democracy*, Vol. 6, No. 1. pp. 65-78.

[http://muse.jhu.edu/demo/journal\\_of\\_democracy/v006/putnam.html](http://muse.jhu.edu/demo/journal_of_democracy/v006/putnam.html)

Rheingold, H. (1993). *The Virtual Community*. Addison-Wesley, Reading MA.

Suler, J. (2000). Bringing Online and Offline Living Together: The Integration Principle. In the Psychology of Cyberspace (orig. pub. 1996).  
<http://p24601.rider.edu/suler/psycyber/integrate.html>

Schiano, D. J. and White, S. (1998). The First Noble Truth of Cyberspace: People are People (even when they MOO). In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'98)*. April 18-23 1998, LA, California, USA, ACM pp 352-359.

Sillence, E & Baber, C. (2004). Integrated Digital Communities: Combining Web based Interaction with Text Messaging to Develop a System for Encouraging Group Communication and Competition. *Interacting with Computers* Vol. 16, No. 1. pp. 99-113.

Weinreich, F. (1997). Establishing a Point of View Towards Virtual Communities. *Computer Mediated Communication*, 3 (2). Available:  
<http://www.december.com/cmc/mag/1997/feb/wein.html>

Wellman, B. (1996). Are Personal Communities Local? A Dumptarian Reconsideration. *Social Networks*, Vol. 18, pp. 347-354.

Wilbur, S. (1997). *An Archaeology of Cyberspaces: Virtuality, Community, Identity*.

In D. Porter (Ed.). *Internet Culture*. Routledge, New York, pp5-22.

|        | Source of information |       |    |     |               | % of total messages | Personal information | Contact details |
|--------|-----------------------|-------|----|-----|---------------|---------------------|----------------------|-----------------|
|        | Email                 | Radio | TV | Web | Book or paper |                     |                      |                 |
| Site A | 2                     | 9     | 15 | 17  | 5             | 15%                 | 28 (9%)              | 1 (<1%)         |
| Site B | 1                     | 1     | 9  | 2   | 4             | 4%                  | 4 (<1%)              | 37 (9%)         |

Table 1 The number of messages containing a reference to a source of information, personal details or contact information

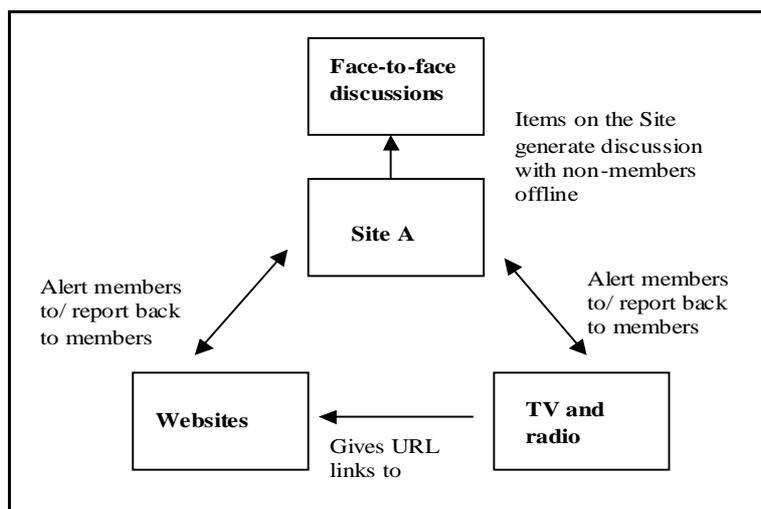


Figure 1. Integration of technologies, information and communication channels in Site A (Email list) community

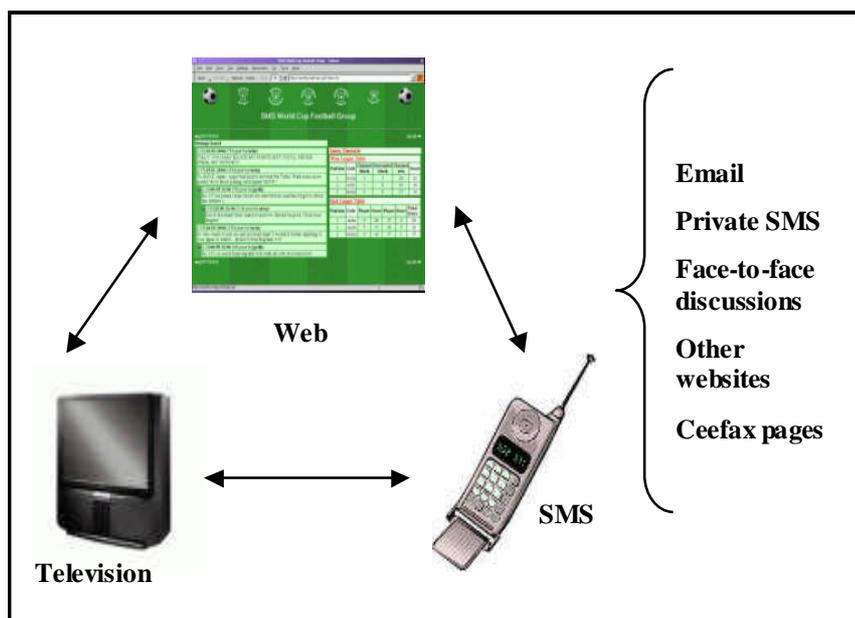


Figure 2 Integration amongst technologies for community support